



DOCUMENTATION OF NATURE-BASED PROGRAMS at Green Chimneys



UNIVERSITY *of*
DENVER

GRADUATE SCHOOL OF SOCIAL WORK
Institute for Human-Animal Connection



Acknowledgements

We would like to acknowledge all the dedicated individuals at Green Chimneys – both human and animal – who work tirelessly to provide contexts that promote youth thriving, as well as the students who shared their invaluable experiences and insights.

Dedicated to the memories of Sam “Rollo” and Myra Ross



... and Spike.

Who We Are

Housed within the Graduate School of Social Work at the University of Denver, the Institute for Human-Animal Connection is an internationally recognized center for research, ethics formation, and clinical training, as well as a respected source of scientific and scholarly information on the human-animal bond. We believe that the quest for new knowledge about human-animal connections and social-ecological systems must reflect respect for social justice, animal well-being, cultural and biological diversity, and beneficial social change.

Development of the Report

This documentation report was developed through a multi-phase process. First, the Institute for Human-Animal Connection's research team – comprised of staff, graduate-level social work students, and external partners and colleagues – conducted a comprehensive review of the relevant research literature to evaluate the impact of nature-based interventions on the social-emotional learning and positive youth development of children and adolescents with psychosocial and special education needs. This review included studies of animal-assisted interventions (and human-animal relationships, more generally), horticultural-based interventions, and natural environments interventions in settings similar to Green Chimneys, such as schools and after-school programs, residential treatment facilities, community-based mental health centers, hospitals and clinics, and farms and natural environments. A cornerstone of this process was to underscore the importance of actively ensuring animal welfare and environmental sustainability in nature-based interventions designed primarily to improve human health and development. Secondly, team members directly observed Green Chimneys' programming to gain further understanding of the diverse nature-based interventions offered to students and their apparent effects. Likewise, semi-structured interviews with over 100 Green Chimneys staff members were conducted across the farm, school, clinical, and residential life departments. The Institute for Human-Animal Connection intends to update this report on a regular basis (i.e., at least once every two years).

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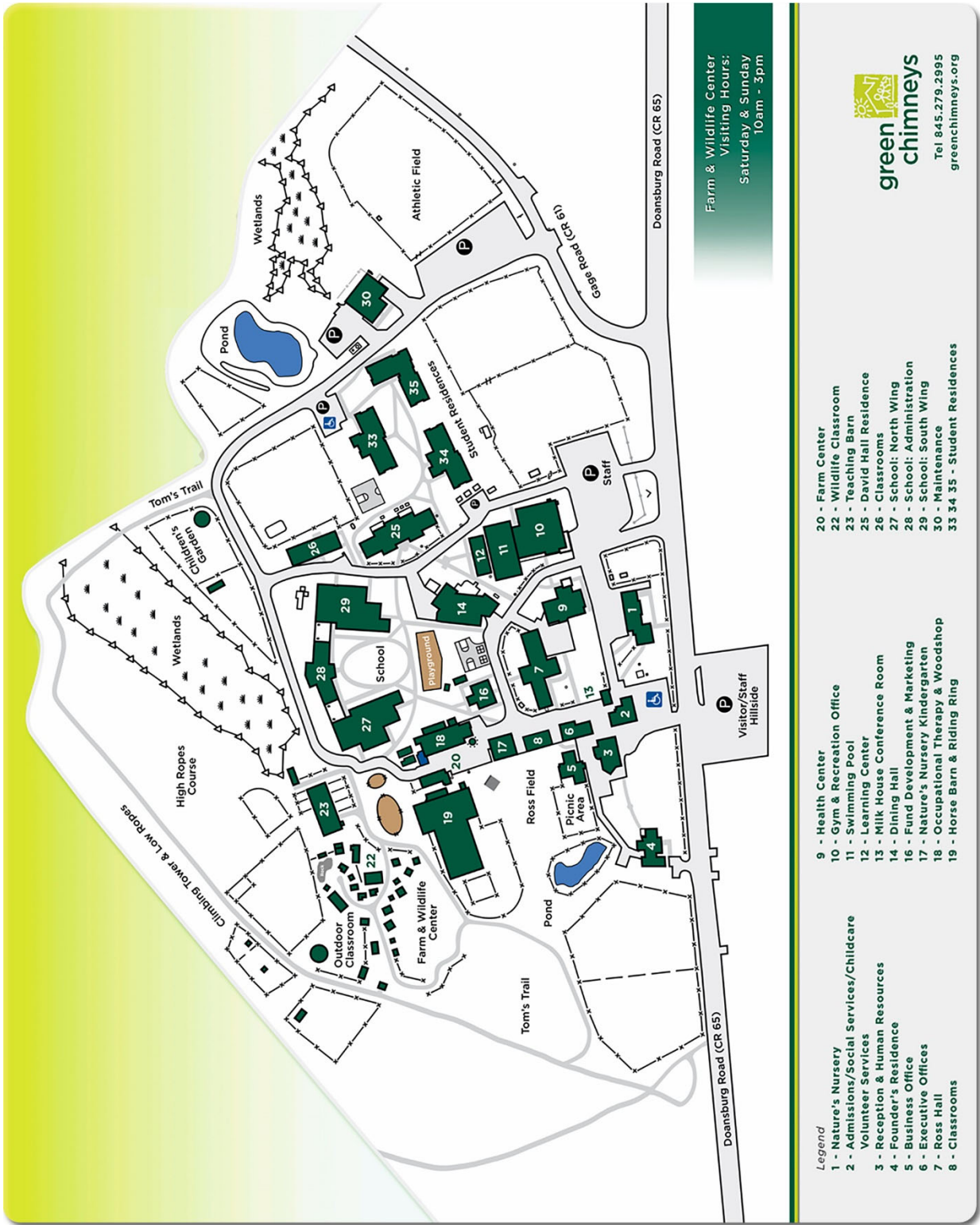
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LIST OF ACRONYMS

AAI	Animal-Assisted Intervention
ADHD	Attention Deficit Hyperactivity Disorder
AED	Automated External Defibrillator
ASD	Autism Spectrum Disorder
CASEL	Collaborative for Academic, Social, and Emotional Learning
CBT	Cognitive Behavioral Therapy
CPR	Cardiopulmonary Resuscitation
CTE	Career Technical Education
DBT	Dialectical Behavioral Therapy
DHHS	Department of Health and Human Services
Eagala	Equine-Assisted Growth and Learning Association
ED	Emotional Disturbance
HAI	Human-Animal Interaction
HBI	Horticultural-Based Intervention
IAHAIO	International Association of Human-Animal Interaction Organizations
IDEA	Individuals with Disabilities Education Act
IEP	Individualized Education Program
LD	Learning Disability
LRE	Least Restrictive Environment
NBI	Nature-Based Intervention
NEI	Natural Environments Intervention
NYSED	New York State Education Department
OT	Occupational Therapist
PATH, Intl.	Professional Association of Therapeutic Horsemanship International
PE	Physical Education
PTSD	Post-traumatic Stress Disorder
PYD	Positive Youth Development
SEL	Social-Emotional Learning
SWPBIS	School-Wide Positive Behavioral Intervention and Supports
TA	Teaching Assistant
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service

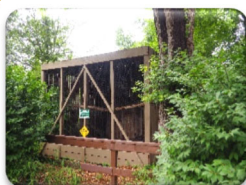
Green Chimneys Campus Map



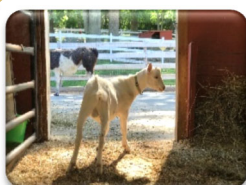
Green Chimneys Nature-Based Program Areas



The **Equine Program** is home to around 20 different equines – including horses, donkeys, and ponies – and two Bactrian camels. A variety of equine-assisted therapies, activities, and educational interventions take place in and around the Horse Barn, Riding Ring, and Outdoor Arena. These include therapeutic riding, hippotherapy, groundwork, and classes on horse anatomy and showmanship.



The **Wildlife Center** houses nearly 50 wild and exotic animal species, such as birds of prey and other birds, insects, reptiles, and chinchillas. Green Chimneys provides non-releasable wildlife with permanent care, as well as sanctuary to injured animals undergoing rehabilitation. Here, students partake in animal-assisted interventions that place a primary focus on the indirect care of the animals and their habitats.



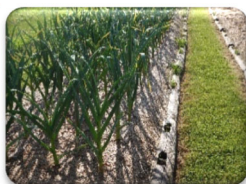
The **Teaching Barn** houses over 100 domesticated farm animals, including large hooved animals, small animals, and birds (e.g., emus and chickens). In this program, children and youth participate in such interventions as sheep- or pig-assisted therapy, as well as farm science and other educational opportunities. In addition, the Teaching Barn facilitates diverse Learn and Earn activities and Green Chimneys' active 4-H Program.



The **Canine Program** partners with a local shelter to provide socialization and basic training to shelter dogs to improve their chances of adoption. Students participate in all aspects of care and training, from feeding and walking to bathing and basic obedience. Also, the dogs may greet the students in the morning or visit them in the dorms. On a smaller scale, staff may also include their own companion dogs in select therapeutic and educational interventions with students.



The **Educational Garden and Greenhouse** provide students with organized horticultural programming to facilitate supportive human-plant interactions. Students are also provided an opportunity to foster strong relationships with staff and community members through multiple horticultural interventions, activities and education, such as Garden Club and Class.



The **Boni-Bel Farm and Country Store** is an off-campus, working farm that provides students with opportunities to learn about crops and wildlife, operate machinery, and gain skills in sustainable farming and career technical education. The farm area includes a barn, country store, community-supported agriculture/farm stand, chicken habitat, bee colony, and maple sugar shack.



Natural Environments Interventions and Recreational Programs encompass a wide variety of opportunities for students to engage with the natural environment while developing interpersonal and emotional regulation skills, as well as challenging themselves physically. Sites for these interventions include Tom's Trail and the Campus Forest, the Challenge Course, and the nearby Great Swamp.

PART I

INTRODUCTION



*I wanted to create a place where children
and animals could grow up together.*
—Sam “Rollo” Ross

Chapter 1:

An Overview of Nature-Based Programming at Green Chimneys

1.1 Introduction to Green Chimneys

Since 1947, the mission of Green Chimneys has been to empower youth to maximize their full potential through the provision of educational, clinical, residential, and recreational services. As a 501c3 corporation and approved New York State 853 private school, Green Chimneys seeks to help students with special education and psychosocial needs (particularly those who have been unsuccessful in traditional academic settings) cultivate meaningful connections with family, peers, community, animals, and the natural world in a safe and supportive environment. Located on 350 acres of private farmland in Brewster, NY, Green Chimneys is home to: (a) state-of-the-art classrooms for students enrolled in 1st through 12th grade; (b) residential student housing; (c) healthcare and therapy facilities; (d) administrative offices and meeting spaces; (e) an indoor pool and gymnasium; (f) an outdoor climbing tower and ropes course; (g) Teaching and Horse Barns, including a riding ring and outdoor arena; (h) a Wildlife Center; (i) canine kennel facilities; (j) an Educational Garden and Greenhouse; (k) the Boni-Bel Farm and Country Store; (l) a walking trail and forest environment; (m) numerous grazing pastures; and (n) access to other engaging nature-based and recreational environments, such as nearby lakes, wetlands, and hiking trails (see *Green Chimneys Campus Map* on page 10).



The natural amenities of the Hudson River Valley provide a rich backdrop for the nature-based interventions offered at Green Chimneys' Brewster campus, located in Putnam County, New York.

Today, through the application of a *positive youth development* (PYD; Lerner et al. 2005) treatment approach, Green Chimneys staff and volunteers serve more than 200 students annually through world-renowned therapeutic day and residential life programming (Green Chimneys, 2019b; Lerner et al., 2005). According to Lerner et al. (2011), PYD can be conceptualized as:

1. *A developmental process*
2. *A philosophy or approach to youth programming*
3. *Instances of youth programs and organizations focused on fostering the positive development of youth*

Two cornerstones of PYD as an approach to youth programming are: (a) the *Five Cs* (i.e., Competence, Connection, Confidence, Character, and Caring) and (b) the *Big Three*, which include positive and sustained relationships between youth and adults; activities that build critical life skills; and opportunities for youth to use these skills as participants in, and leaders of, valued community activities (U.S.

Department of Health and Human Services or DHHS, 2019). These elements, along with social-emotional learning (SEL), provide a framework for the therapeutic and educational interventions offered at Green Chimneys (discussed in greater detail later in this chapter and in Chapter 2).



This onsite bulletin board celebrates human-animal and nature-based interventions, both of which play a vital role in Green Chimneys' PYD programming.

Green Chimneys applies a PYD treatment approach within a unique context that thoughtfully integrates nature – including animals, plants, and the natural environment – throughout its campus. The educational, therapeutic, and recreational services set within this ecosystem-inclusive context are generally referred to as *nature-based programming*, which can be broadly subdivided into the following domains: (a) animal-assisted interventions (AAIs), (b)

horticultural-based interventions (HBIs), and (c) natural environments interventions (NEIs; see Figure 1.3.1; Annerstedt & Währborg, 2011). Grouped within these three domains are diverse forms of human-animal-environment interaction, such as animal-assisted therapy, horticultural therapy, facilitated green exercise, ecotherapy, humane education, and nature and wilderness therapies. While each of these interventions has its own particular therapeutic and/or educational goals, they are all linked to each other under the common umbrella of their shared intervention category (i.e., according to their primary incorporation of animals, plants, or the broader natural environment; see Figure and Table 1.3.1).



Students and staff bond with the animals who reside permanently at Green Chimneys, like this Yorkshire pig named Wilbur.

Although many benefits can be derived from a purely passive experience with the environment, nature-based interventions, education, and programming seek to improve human well-being through intentional processes (Sempik, Hine, & Wilcoz, 2010). Of note, the terms “nature-based programming” and “green care” are often used interchangeably (Haubenhofner, Elings, Hassink, & Hine, 2010; Sempik et al., 2010), as they both can describe physical, emotional, and mental health therapies; social rehabilitation; and educational and vocational programs that feature nature and human-animal interaction (HAI) for vulnerable populations. However, Green Chimneys and the Institute for Human-Animal Connection at the University of Denver have chosen to use “nature-based programming” as the preferred nomenclature to describe the work at Green Chimneys. In the past, the term “green care” has been associated with commercial animal farming and food production (Hine, Peacock, & Pretty, 2008). As the use of animals for meat and dairy production is not a part of the work or the environment at Green Chimneys, the

term “nature-based programming” is utilized by both institutions, and throughout this report’s text, to help clarify this important distinction.

Student Population

Students enrolled at Green Chimneys may be diagnosed with one or more conditions related to emotional and/or behavioral disturbances, learning disabilities (LD), autism spectrum disorder (ASD), multiple disabilities, and/or other health conditions (Kaufmann, Beetz, Kinoshita, & Ross, 2015; New York State Education Department or NYSED, 2019b). During the 2015 - 2017 academic years, the majority of Green Chimneys students identified as male (90%; $n = 379$) and had either neurodevelopmental and/or mood disorders (see Table 1.1.1). In addition, students ranged in age from 5 to 17 years ($M = 10$ years), with most identifying as white (68%) or black (14.3%; see Table 1.1.2).

Table 1.1.1. Student Primary Diagnosis

<i>Diagnosis Type</i>	<i>n (%)</i>
Neurodevelopmental Disorders	169 (40%)
Mood Disorders	149 (36%)
Impulsive Control Disorder	42 (10%)
PTSD and Trauma- Related Conditions	21 (5%)
Anxiety Disorders	20 (5%)
Psychotic Disorder	9 (2%)
Adjustment Disorders	7 (2%)
No diagnosis	2 (<1%)
Total (2015-2017)	419

Table 1.1.2. Student Race & Ethnicity

<i>Race & Ethnicity</i>	<i>n (%)</i>
White	285 (68%)
Black	60 (14.3%)
Hispanic	19 (4.5%)
Asian	4 (1%)
Multi-racial	34 (8.1%)
Missing data	17 (4.1%)
Total (2015-2017)	419

Green Chimneys' General Staff and Volunteers

At Green Chimneys, a transdisciplinary team of specialized therapists, clinicians, educators, interns, and support staff work collaboratively to provide an individualized approach to each student's learning and therapy, as well as thoughtful care for resident animals, onsite farm and green spaces, and the surrounding natural environment. Likewise, hundreds of volunteers give their time to the organization



Annual events, such as sheep shearing, require Green Chimneys staff, students, and volunteers to work collaboratively.

each year. Included below are descriptions of “general” Green Chimneys staff and volunteers (i.e., those who may work with students, colleagues, animals, and plants *across campus*), who are included throughout this report. The roles of staff, interns, and volunteers who specialize in certain program areas (e.g., the Wildlife Center, the Teaching Barn, or Boni-Bel Farm and Country Store; see *Green Chimneys Nature-Based Program Areas* on page 11) are discussed in detail in the forthcoming chapters (e.g., in Chapter 5, Chapter 6, and Chapter 10, respectively).

Mental Health Clinicians (Social Workers, Psychologists, Counselors) – Green Chimneys’ licensed clinical social workers, psychologists, and counselors are integral to the organization’s specialized therapeutic services, including animal-assisted therapy, horticultural therapy, and natural environments therapy (see Figure and Table 1.3.1). These mental health practitioners often work side by side with program area staff to help students reach specific treatment goals through individual and group therapy sessions. For example, a social worker may work closely with a student, the Horse Barn Manager, and Green Chimneys’ two camels – Phoenix and Sage – on camel handling and leading as a means of enhancing the student’s confidence through supportive human-animal connection. In addition, a school psychologist may guide mounted equine-assisted psychotherapy sessions for youth learning dialectical behavioral therapy (DBT)

skills (i.e., mindfulness, emotional regulation, and/or interpersonal communication) as a complement to traditional therapy (Rizvi, Steffel, & Carson-Wong, 2012). All mental health clinicians at Green Chimneys receive training in Therapeutic Crisis Intervention, as well as proper techniques to engage safely and effectively with various animals, plant species, and natural settings. Psychotherapy sessions are also documented to track student progress over time.

Occupational Therapists – Certified and licensed occupational therapists (OTs) at Green Chimneys work with youth and program area specialists to develop and strengthen the essential skills students need for everyday living. Therapeutic goals of occupational therapy often include the development of fine and gross motor skills; process skills like observing, classifying, sorting, and measuring; social and interpersonal skills; and self-confidence through mastering new tasks and responsibilities. OTs receive training and provide therapy within each of the three nature-based intervention (NBI) domains (i.e., AAIs, HBIs, and NEIs; see Figure 1.3.1). For example, an OT may help a child strengthen his fine motor skills in the Greenhouse by sorting seeds and preparing them for planting. Through this process, the student may also learn the importance of time management, gain confidence in his abilities, and connect with the OT and the natural environment. At the end of each session with a student, OTs document his or her progress toward meeting individual therapy goals. Of note, Green Chimneys’ OTs receive Therapeutic Crisis Intervention training prior to working with children and youth.

Classroom Teachers and Teaching Assistants – As a specialized, therapeutic, and alternative placement school for students in 1st through 12th grade, Green Chimneys employs a variety of teachers specializing in subjects such as special, humane, and physical education (PE); math; history; language arts; science (including farm and wildlife science); and gardening. All educators must have a valid teaching license or certificate in the state of New York, and be trained in Therapeutic Crisis Intervention. In addition, teachers often partner with Teaching Assistants

(TAs) in their classroom to help with curriculum development and instruction, and to provide individualized and supportive attention to students according to their specific academic needs. This structure of having at least two teaching professionals per class is often useful when including animal-assisted and other nature-based educational components in classroom activities (see Figure 1.3.1); in such cases, both the teacher and the TA can monitor for safe and productive interactions with animals and nature. Moreover, teachers and TAs work with a general supervisor and program area specialists on the design and delivery of nature-based classroom materials, with a concentrated focus on both academic learning and SEL. Depending on the subject and the student's individualized education program (IEP), teachers provide children and youth with grades on a quarterly basis.

Residential Counselors – Members of the Residential Life team at Green Chimneys work with students living in the onsite dorms (see *Green Chimneys Campus Map* on page 10), including overnight, during the school week, and on the weekends. These individuals are primarily responsible for supervising residential youth in the dorms and on off-campus trips; planning and supervising age-appropriate recreational activities for residents; and working with other departments to support residents in attaining the goals outlined in their treatment plans and IEPs. While prior work experience in the field is not required, Residential Counselors must have at least a high school diploma and be trained in Therapeutic Crisis Intervention.



Residential Counselors are encouraged to interact with shelter dogs during canine visits to the dorms. Being receptive to new people and participating in normal canine behaviors are important skills for a dog preparing for a new home.

Nursing Staff – Nurses at Green Chimneys are responsible for supporting the overall health and safety of students by providing onsite medical care, as advised by staff physicians. Additionally, nurses conduct or coordinate all intake assessments upon a student’s admission to Green Chimneys, including initial physical and dental exams; vision and hearing screenings; dietary assessments and laboratory tests; and immunization record reviews. Nursing staff also serve as members of the student’s treatment team, administer prescribed medications, and arrange for specialized healthcare services (as needed). Individuals who fill these positions must hold a New York State Registered Nursing License and have at least three years of nursing experience, with at least one year working directly in pediatrics.

Volunteers – Volunteers are the essential “lifeblood” to the successful operation of Green Chimneys’ unique programming (Green Chimneys, 2019a, para. 1). Dedicated individuals and groups from the surrounding community contribute to a variety of daily and long-term projects, including caring for animals in the Teaching Barn and Wildlife Center, serving as mentors for students in the Horse Barn, harvesting vegetable crops at the Educational Garden and Boni-Bel Farm, providing administrative support, and assisting with special and educational events. Any potential volunteer must work with Green Chimneys’ Volunteer Coordinator to complete a thorough background check and sign the organization’s Confidentiality of Agency clause, which ensures that each child’s medical and behavioral health information remains private. As Green Chimneys houses, educates, and treats vulnerable minors, every measure must be taken to protect their safety and that of the animals living onsite. As such, all volunteers undergo extensive training in Therapeutic Crisis Intervention before ever working with a student, and receive detailed information regarding the policies, practices, and procedures specific to their program area of focus (see page 12). Only individuals who have volunteered with Green Chimneys for at least three months may work one-on-one with students.

Therapeutic and Educational Interventions Offered at Green Chimneys

Similar to other residential and day school treatment facilities, staff at Green Chimneys offer children, youth, and their families comprehensive therapy and educational opportunities, such as:

Individual therapy – Every Green Chimneys student is assigned to a licensed clinical social worker or other mental health clinician and, depending on his or her specific needs, may work one-on-one with an OT as well. Most students meet with their therapist for an average of 50 minutes each week, as specified by the number of hours in his or her IEP. As discussed above, clinicians often incorporate an animal-assisted or nature-based component into individual therapy, such as working with a student while he or she walks a shelter dog or visits the Wildlife Center during a therapy session.

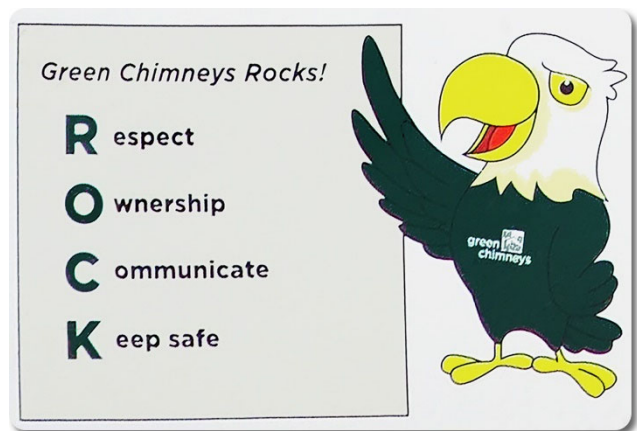
Residential group therapy – Students who reside on the Green Chimneys campus receive a weekly 50-minute group therapy session from the residential center’s social work team. These sessions have a ratio of two social workers to eight students, and incorporate a variety of evidence-based practices like cognitive behavioral therapy (CBT) and DBT.

Family therapy – Every family with a child enrolled at Green Chimneys school is expected to engage in family therapy sessions once or twice per month. Sessions are led by the child’s social worker, and take place on campus for local families. Families who live farther away are provided with web cameras (if needed) so they can engage in therapy sessions remotely.

Parent management training – Although not required, parent management training is offered to all family guardians to help them effectively connect with their child, and to enhance their understanding of their child’s individual treatment goals. Over the course of eight weeks, these

on-campus trainings take place for half a day on weekends, and include both didactic and practical components. Sessions focus on a combination of parent strengths, management strategies (e.g., positive behavior reinforcement and implementing appropriate consequences with their child), and DBT skills (see above) to empower parents to support their child's on-campus treatment process, as well as their transition back to the home environment.

School-Wide Positive Behavioral Intervention and Supports (SWPBIS) – SWPBIS is a therapeutic program that seeks to change negative school environments by improving systems and procedures (e.g., discipline, reinforcement, data management, training, office referrals), specifically in regard to staff and student behaviors. The focus of SWPBIS is on (a) improving behaviors, social learning, and organizational behavioral principles among all students and staff; (b) preventing undesired or distracting behavior in youth; and (c) strengthening the school's organizational health by constructing “primary (school-wide), secondary (classroom), and tertiary (individual) systems of support” (Bradshaw, Koth, Bevans, Ialongo, & Leaf, 2008, p. 463). For instance, an SWPBIS school sets “positively stated school-wide behavioral expectations” (e.g., being responsible and respectful) for students (Bradshaw et al., 2008, p. 463). These behaviors are posted throughout the school, both inside and outside the classroom. Then, a behavioral support coach, such as a school counselor, conducts a functional behavioral assessment and develops a plan specific to each individual student's behavioral expectations (Bradshaw et al., 2008). At present, Green Chimneys is adopting an evidence-based SWPBIS preventive framework, which has shown to be effective in instilling SEL within their student population.



Broad examples of the intentional incorporation of animals, plants, and the natural environment into Green Chimneys' unique PYD approach include the interventions described below. For specific definitions of AAIs, HBIs, and NEIs at Green Chimneys, see Section 1.3.

Humane education – Throughout Green Chimneys' curricula and programming, children and youth are taught kindness and empathy by caring for, and recognizing the importance of, animals and the natural world.

Care of animals, gardens, and farm environments – Children and youth at Green Chimneys play an important role in the care of farm animals, equines, wildlife, and dogs by providing them with food, water, opportunities for exercise and play, clean-living environments, and affection. Likewise, students regularly contribute to the health and sustainability of Green Chimneys' organic gardens and farmland.

Family & Consumer Sciences Education – To meet NYSED standards, all Green Chimneys students participate in Family & Consumer Sciences classes that focus on the development of life skills to manage the “challenges of living and working in a diverse global society” (NYSED, 2011, para. 1). Examples include classes where children cook the vegetables they helped grow in the Educational Garden; learn about where food comes from, healthy eating habits, plant anatomy, and seed propagation in the Greenhouse; and gain business skills by selling farm products at the Boni-Bel Country Store (adjacent to the main Green Chimneys campus).



Produce grown by students and staff in the Educational Garden is often eaten fresh on the spot by both students and resident animals, and is occasionally incorporated into meals prepared by Dining Hall staff.

1.2 Green Chimneys' Special Education and Mental Health Services

Federal legislation governing the delivery of special education services comes primarily from the Individuals with Disabilities Education Act (IDEA) of 2004 and its amendments (IDEA, 2015). IDEA was created “to ensure that all children with disabilities have available to them a free appropriate public education that emphasizes special education and related services designed to meet their unique needs and prepare them for further education, employment, and independent living” (IDEA, 2015, § 1400.d.1.A). In addition, IDEA mandates that each student identified for special education services will receive an IEP, which is a written plan developed, reviewed, and revised by a team of specialists and the child’s parent(s) that outlines how to meet his or her academic and non-academic (e.g., SEL) goals (IDEA, 2015). IEPs include assessment results that identify how “a child’s disability affects the child’s involvement and progress in the general education curriculum,” as well as measurable annual goals that address the child’s academic, functional, behavioral, and social-emotional needs (IDEA, 2015, § 1414.d.1.A.i).

A key step toward meeting these identified needs is determining the least restrictive environment (LRE) that will maximize the child’s opportunities to learn and socialize with typically developing children. Ideally, students with disabilities would receive any specialized instruction required (e.g., adapted curricula) in the general education classroom, complemented by assistive technologies, specialized services and practitioners, and/or accommodations (e.g., a laptop, access to a speech-language therapist, and/or permission to take frequent breaks during the course of completing assignments). However, “special classes, separate schooling, or other removal of children with disabilities from the regular educational environment” may be warranted “if the nature or severity of the disability is such that education in regular classes with the use of supplementary aids and services cannot be achieved satisfactorily” (IDEA, 2015, § 1412.a.5.A).

Green Chimneys as an Alternative Placement School



Green Chimneys operates as a private, therapeutic day school under the auspices of NYSED. New York State 853 private schools are approved by, and created under, Chapter 853 of the Laws of 1976 (NYSED, 2013), and provide day and/or residential programs for students with disabilities. Students are often placed in an 853 school when a home school or neighboring district does not have the resources or capacity to provide “a free appropriate public education” that meets their disability-specific needs. As an 853 school, Green Chimneys is considered a school of “continuum alternative placement” under IDEA regulations, meaning that enrolled students require specialized supports and aids unavailable in their home districts to meet their educational goals (IDEA, 2015, § 300.115). Although more restrictive than most general education environments, Green Chimneys is the LRE for its students, for whom a residential treatment facility or hospitalization is not necessary. Notably, Green Chimneys offers students with differing learning abilities a less stressful school environment, with the goal of maximizing their success in learning adapted curricula (see above for examples) and essential life skills.

When students are admitted to Green Chimneys, they come with a transfer IEP from their previous school. A transfer IEP is a binding document that lays out the student’s IEP services and goals, which must then be followed (at least initially) by the new school (NYSED, 2019b). Thirty days after the child is admitted to Green Chimneys, the transfer IEP undergoes program review. This provides Green Chimneys staff with an opportunity to revise the student’s academic goals

and/or service hours for related service therapies, as appropriate (L. Marino, personal communication, March 23, 2017).

In addition to meeting the requirements of IDEA, Green Chimneys is also subject to the National Association of Private Special Education Centers. In order to meet this Association's membership standards, Green Chimneys must comply with the accreditation standards set in the National Commission for the Accreditation of Special Education Services (2017). These standards encompass a wide range of institutional responsibilities, such as administrative and professional personnel duties; the actual services offered (e.g., medical and educational services), which specify the population served; and program evaluation (National Commission for the Accreditation of Special Education Services, 2017).

Placement Determination at Green Chimneys School and Residential Life Center

Student placement at Green Chimneys is decided by a Committee on Special Education that evaluates each student's academic and health history, determines his or her eligibility, revises or creates his or her IEP, and conducts annual IEP reviews (Geary & Miller, 2012). The Committee on Special Education consists of the following members:

- (a) the student (if appropriate);
- (b) the parent(s)/caregiver(s);
- (c) a school district representative;
- (d) the school psychologist;
- (e) an educational diagnostician;
- (f) a grade-level general education teacher;
- (g) the student's special education teacher;
- (h) an interpreter (if needed);
- (i) related service providers, such as a speech-language therapist, OT, school social

Behavior Categories	E	G	S	L	N
Comments:	E	E	E	E	E
Personal Goal I. Will accept limits and boundaries with 3 prompts.	/				
Personal Goal II. Will identify and utilize coping skills with staff support.	/				
Personal Goal III. Will remain physically and verbally safe with staff support.	/				
School Goal IV. Overall classroom behaviors		/			

Key: EE: Excellent Effort GE: Good Effort SE: Satisfactory Effort LE: Little Effort NE: No Effort

Date: 3/22 Signature: Belmont/Kraus Department: _____

Behavior Support Services tracks student behaviors using a Behavior Rating Sheet, which staff complete with the student. This allows students to reflect on the progress they have made towards their social-emotional and academic goals.

worker, or any individual who can provide data and information regarding the student's progress (Geary & Miller, 2012). During the initial assessment of service, the student's educational, behavioral, cultural, and health backgrounds are considered (NYSED, 2010).

Once the Committee determines that the student needs special education and related service hours (e.g., those provided by the speech-language therapist, OT, and/or school social worker), members may refer the student to Green Chimneys, where an admissions panel considers whether the student qualifies for services. Notably, the panel does not admit students who have any criminal or substance use history, or a primary or comorbid diagnosis of conduct disorder (J. Hartmann, personal communication, March 21, 2017). In full transparency, these admission criteria restrictions are in place to ensure the safe and appropriate provision of services for the vulnerable population of children on campus (S. Klee, personal communication, January 30, 2019). Additionally, Green Chimneys does not admit students who have an intellectual disability or verbal IQ of 70 or below, as the school cannot currently provide specific and appropriate educational support for this population (S. Klee, personal communication, January 30, 2019). Lastly, due to the natural and expansive layout of the Green Chimneys campus, students who require extensive medical attention or who have physical disabilities are evaluated on a case by case basis for admission to Green Chimneys.



After admission, the student's progress is monitored annually through the measurable goals set forth in his or her IEP (NYSED, 2010). Every three years, the student is re-evaluated by the Committee on Special Education in all areas of special education needs and services.

Determinations regarding whether service hours will be increased or decreased, including related

services recommended by specialists in respective fields, are made based on the student's educational progress or regression (NYSED, 2010). Additionally, standardized and validated assessment tools are used to measure the student's intellectual and social-emotional progress. These assessments include, but are not limited to, the Wechsler Intelligence Scale for Children, the Behavioral Assessment System for Children, and the Wechsler Individual Achievement Test.



If a student at Green Chimneys demonstrates progress toward the goals in his or her IEP, the Committee will periodically re-evaluate the student to ensure that Green Chimneys remains an appropriate fit in terms of providing the LRE for learning. For example, prior to the annual IEP meeting, Committee

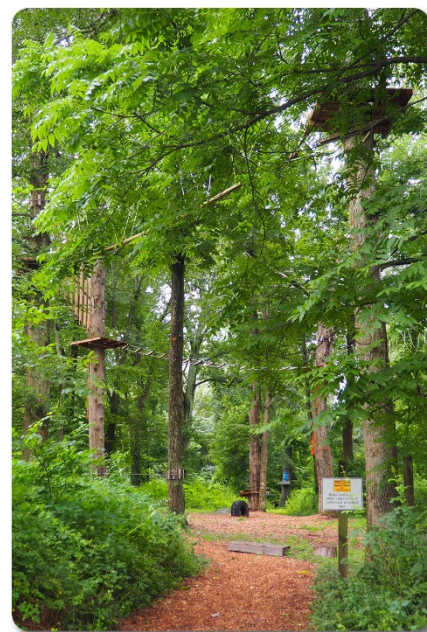
members may meet and recommend that a student who is achieving his or her treatment goals at Green Chimneys be transferred back to a district school. In most cases, students receiving special education classroom services who are making gains in a segregated school environment (like Green Chimneys) are moved back to an inclusive district school setting to learn among their typically developing peers.

Nature-Based Education and Experiential Learning

Nature-based education differs somewhat from traditional and highly physical outdoor recreational education in its focus on the myriad ways that students can connect to the surrounding natural environment, including plants and animals (Robbie, 2013). Beames, Higgins, and Nicol (2011) share how nature-based education sparks curiosity in students which, in turn, can inspire engagement and motivation towards the lesson. Notably, nature-based education can increase a student's positive regard for learning due to nature's ability to decrease mental and attention fatigue (Kaplan, 1995), as well as its calming and experiential qualities

(Berto, 2014; Ulrich, 1983; Waite, 2011). Moreover, nature provides students with the largely unique opportunity of leaving the confines of a typical, institutional classroom during the school day and exploring general education topics through other captivating approaches.

Nature-based educational methods may also support students through instilling self-confidence and responsibility, fostering a high degree of authenticity in relation to the experience, building interpersonal strengths, and enhancing cognitive engagement and positive sensory stimulation (Beames, Higgins, & Nicol, 2011). A recent study by Waite (2011) found that students appear to be more comfortable expressing positivity and personality in the outdoors as compared to indoor settings. Notably, teachers can play an important role in increasing outdoor interests among students by modeling their own passionate connections with the environment (where applicable). This can take the form of holding classes outside, identifying favorite aspects of nature, and/or encouraging student inquiry and participation in class discussions to encourage compassion for environmental conservation and animal well-being.



Green Chimneys' nature-based curricula and programs include humane, horticultural, and outdoor recreational education; meditation and reflection in nature; farm and wildlife science classes; canine- and equine-assisted programming; and instructional activities at the Teaching Barn, such as the conscientious care of farm animals and their habitats. Through its rich biodiversity, history, and provision of hands-on interactions, the local natural environment at Green Chimneys is an ideal and supportive setting for experiential, nature-based learning for children and youth with special education and mental health needs.

Mental Health Therapeutic Services

Green Chimneys' team of school administrators and mental health professionals (each of whom are trained in family systems and trauma-informed care) focus their efforts on ensuring the campus meets the goals set forth in New York State's Children's Mental Health Act of 2006. Prior to admittance to Green Chimneys, each student's mental health is thoroughly assessed regardless of whether he or she is enrolled in the day school or residential life center. This process helps reduce any duplication of interventions that did not work for the student in the past, and allows for the modification or inclusion of novel evidence-based mental health strategies.

Incoming Green Chimneys students are assessed via the Praed Foundation's Child and Adolescent Needs and Strengths Assessment (2011), a parent stress scale, a family environment scale, and potentially a depression or anxiety scale (J. Hartmann, personal communication, August 21, 2017). Currently, Green Chimneys is in the process of identifying and evaluating an appropriate trauma assessment to administer to new students at intake (S. Klee, personal communication, March 28, 2019). Every six months (and upon exiting the program), students complete the Child and Adolescent Needs and Strengths Assessment. If a student has a noted history of animal abuse or aversion to animals, he or she will be given the Animal-Interaction Assessment. This instrument was created by a Green Chimneys psychologist and lead social worker in an effort to obtain a clear history of a student's exposure to animals, his or her family's interaction with animals, and whether the student can be exposed to animals right away or should initially be given alternative therapeutic resources and interventions (S. Klee, personal communication, March 28, 2019).

Once a student's records and assessments are evaluated, he or she is referred to a member of the mental health team (i.e., a social worker) for counseling services. In addition, Green Chimneys provides families with therapy sessions through bi-monthly appointments, regular support groups, and a monthly Parent & Educator Workshop Series where a wide range of topics on

psychoeducation are discussed (see above; Green Chimneys, 2019). Sibling group opportunities are also offered to provide support and space for these children to process their own experiences and feelings; occasionally animal-assisted activities may be a component of these groups. Overall, both residential and day services students receive routine counseling, as well as exposure to SWPBIS and SEL programming, during their time at Green Chimneys.

Residential Mental Health Services



According to the New York State Department of Health (2013), Green Chimneys qualifies as a support program, which provides care coordination under the Home and Community Based Services Waiver. Such programs provide support to youth in residential settings, with the waiver paying for services not normally covered by Medicaid (New York State Department of Health, 2013; Medicaid.gov., n.d.). Green Chimneys is also a member of the Association of Children’s Residential Centers, which was established in 1956 to provide “a powerful voice for residential interventions through relationships, leadership, advocacy, and the promotion of innovative treatment and best practices” (ACRC, 2019, para. 2). Green Chimneys is designated as a Licensed Residential Children and Youth Community Housing Program by the New York State Office of Mental Health because “the program provides a supervised, therapeutic environment which seeks to develop the resident’s skills and capacity to live in the community and attend school/work as appropriate” (2019, para. 11).

Green Chimneys meets the therapeutic needs of residential students by providing weekly group therapy sessions in the residential hall. During and in between sessions, social workers collaborate closely with Residential Counselors, as students may behave differently in the dorms than in other areas on campus. For example, some students are better able to self-regulate their emotions in the residential setting as compared to school or therapy; having this information can help social workers further customize therapeutic approaches for individual students and/or their residential living group. Residential life staff also have access to each student's Individual Crisis Management Plan, which outlines basic information regarding the student's specific triggers, strategies to de-escalate the student during periods of heightened stress or conflict, and ways to debrief with the student once he or she is in the recovery stage. If modifications to a student's Individual Crisis Management Plan are needed, the residential team will discuss the student's behavior and consult with his or her social worker about potential case adjustments.



A student receives the mental health benefits of interacting with animals and the natural environment when he visits sheep in their pasture.

Additionally, it is the responsibility of the medical and mental health team to determine if any changes to medication or therapeutic counseling are necessary. The Individual Crisis Management Plan is part of the Therapeutic Crisis Intervention model developed by the Residential Child Care Project (2016) at Cornell University.

At Green Chimneys, the frequency and duration of individual psychotherapy is dependent upon the student's IEP. Generally, the therapist will meet with students either once a week for an hour or twice a week for 30 minutes each session, depending on the individual student's needs; more frequent sessions with shorter durations are preferred by some students who find it difficult to stay attentive for a full, consecutive 60 minutes. Whether the intervention is client-driven

ultimately depends on the needs and proclivities of the child. For instance, Green Chimneys staff have observed that youth diagnosed with ASD often enjoy spending time with an animal and may prefer to communicate about the animal's behavior, appearance, and/or temperament – as well as their interaction with the animal – during the therapy session.

Day School Mental Health Services

Green Chimneys is also considered a Licensed Outpatient Treatment Day Program for children and youth, as defined by the New York State Office of Mental Health (2019):

[A Licensed Outpatient Treatment Day Program] ... integrates mental health and age-appropriate education services for children and adolescents living in the community until they can attend regular classes. It usually operates five full days per week during the school year and on a curtailed schedule during the summer (Licensed program type definitions, para. 5).

Throughout the school day, students are given core curriculum classes and “specials,” such as music and art. That said, a day student at Green Chimneys may be pulled from a non-core curriculum class so they can meet with their social worker or other ancillary support staff. Green Chimneys provides day students with a wholly different learning environment than the traditional urban model, with the hope that this change in setting will help the child flourish and meet functional mental health and social work goals to improve their chances of reintegration into a general education setting.

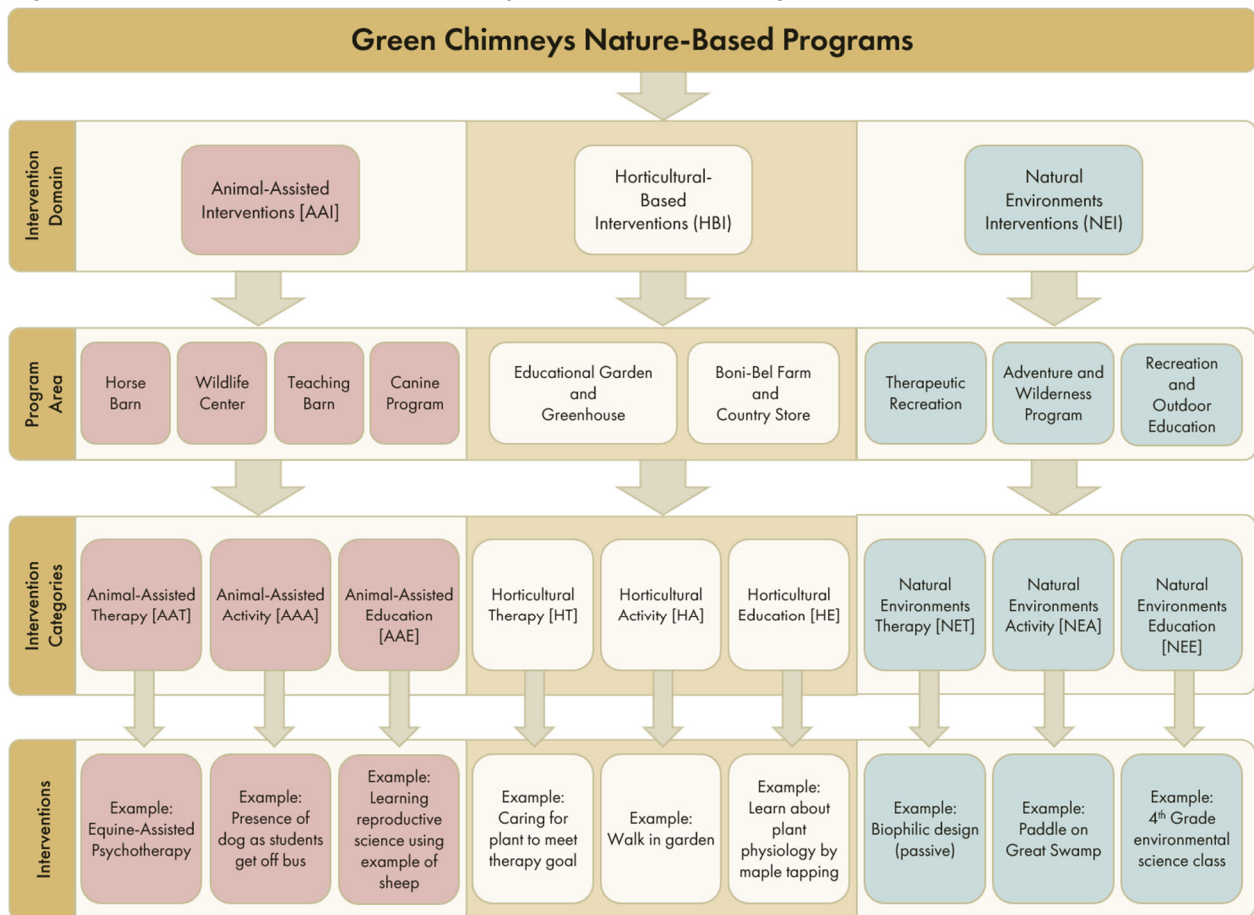
8:30-9:00	ARRIVAL
9:00-9:45	ELA
9:45-10:30	Woodshop/Farm
10:30-11:15	MATH
11:15-12:00	LUNCH
12:00-12:45	RECESS/RIDING
12:45-1:30	Farm/Woodshop
1:30-2:15	SNACK
2:15-3:00	S.S./SCIENCE

Green Chimneys' academic scheduling integrates nature-based and experiential education throughout the school day.

1.3 Developing Common Terminology for the Components of Nature-Based Programs

Green Chimneys' nature-based programs are most broadly classified using three "Intervention Domains," which represent distinct aspects of human interactions with nature: (a) AAIs, (b) HBIs, and (c) NEIs (see Figure 1.3.1):

Figure 1.3.1. Structure of Green Chimneys' Nature-Based Programs



AAIs or animal-assisted interventions are those that “intentionally include or incorporate animals in health, education, and human service[s] (e.g., social work)” (Jegatheesan et al., 2014, p. 5). Rather than stand-alone approaches, AAIs are designed to be complementary to more traditional forms of therapy, treatment, or learning. Examples of AAI include equine-assisted

psychotherapy or a career technical education (CTE) program focused on building a student's responsibility and compassion through farm animal care skills.

HBI or ***horticultural-based interventions*** center on human interactions with plants and plant-rich environments for the purposes of social, vocational, wellness, education, or therapeutic benefit. Examples include activities such as planting, garden maintenance, harvesting crops, plant crafts, and plant-based food production (Annerstedt & Währborg, 2011).

NEI or ***natural environments interventions*** involve human interactions with “natural materials, and/or [the] outdoor environment without any [deliberate] involvement of extra non-human mammals or other living creatures” (Annerstedt & Währborg, 2011, p. 372). Such interventions may include direct interactions between humans and nature, or simply human exposure to the natural environment through a variety of means, including wilderness therapy or outdoor education programs.

Each *Intervention Domain* is divided into Green Chimneys *program areas* (see page 12), such as the Wildlife Center and Teaching Barn, both of which fall under the primary intervention domain of AAI (see Figure 1.3.1). *Program areas* are then subdivided into *Intervention Categories*, which include: (a) therapy, (b) activity, and (c) education (see Figure and Table 1.3.1). The use of these categories provides an orientation to the goals and structural elements of the distinct interventions offered at Green Chimneys. Definitions of terms used across the three intervention domains of animal-assisted, horticulture-based, and natural-environment interventions vary substantially. Therefore, terms used in this report for intervention categories were developed as independent, but complementary, systems for each domain. In other words, while an intervention domain's therapy, activity, and educational interventions each have specific protocols and objectives (see Table 1.3.1), they tend to build on one another, especially if they

take place in the same program area (e.g., in the Horse Barn under the AAI domain or at Boni-Bel Farm under the HBI domain). This system of definitions was initially developed by using common terminology documented in the AAI, HBI and NEI literature, as well as preferentially selecting language that supports consistency of usage across the three intervention domains. Of note, terms (e.g., “animal-assisted therapy” or “horticultural activity”) are often used interchangeably or inconsistently by scholars and practitioners who work in the fields of AAI, HBI, and/or NEI.

Table 1.3.1. Intervention Category Criteria

	Therapy (Animal-assisted therapy; horticultural therapy; natural-environments therapy)	Activity (Animal-assisted activity; horticultural activity, natural-environments activity)	Education (Animal-assisted education; horticultural education; natural environments education)
Primary Purpose	To enhance physical, cognitive, behavioral, and/or social-emotional functioning.	To provide motivational, recreational, and/or leisure experiences that enrich or contribute to general well-being.	To enhance academic learning or develop vocational skills.
Focus of Goals	Structured therapeutic intervention that meets specific treatment goals.	Unstructured enrichment activity not guided by specific treatment or educational goals, though intended to be broadly therapeutic.	Guided by predetermined educational goals and/or a structured curriculum.
Service Provider Training / Credentials	Delivered by a health or human services professional who has an active licensure or degree in accordance with the appropriate accrediting bodies.	Delivered by a professional who has received training regarding the specific activity - as well as the inclusion of animals, plants, and/or the natural environment - to enhance the intervention. The activity can also be unsupervised or provided by a volunteer.	Delivered by an education professional who, at a minimum, has been trained in the pertinent subject matter <i>and</i> has received program-specific training. Ideally, intervention providers have a degree in education and relevant licensure.
Outcome Measures	Progress is measured and tracked through clinical documentation after each session.	Progress is not measured or documented in a formal way.	Progress is measured and documented in the form of grades or performance evaluation.
Examples	Canine-assisted psychotherapy.	An intern brings a camel to the school bus drop-off where students can say hello and pet the camel as they arrive. Monthly garden club.	CTE program that teaches farm animal care skills and is delivered by a trained educator for the specific program. Plant anatomy class.

Terminology for the Domain of Animal-Assisted Interventions

For the *domain of AAI*, the criteria used to differentiate between therapy, activity, and education categories were developed from the definitions included in the 2014 white paper published by the International Association of Human-Animal Interaction Organizations (IAHAIO; Jegatheesan et al., 2014). Although other useful frameworks have also been proposed, the IAHAIO definitions are the most current and widely accepted terms used in the HAI field.

Animal-assisted therapy – AAs considered to be *therapy* are structured interventions that work towards specific and clinically defined goals outlined in an individual’s treatment plan or comparable clinical document (Kruger & Serpell, 2010). The primary purpose of animal-assisted therapy is to enhance the physical, cognitive, behavioral, and/or social-emotional functioning and well-being of the human client or patient through therapies that include animals and HAI (Jegatheesan et al., 2014). Unlike animal-assisted activities (which may be self-led or facilitated by volunteers only), animal-assisted therapy must be primarily directed by a qualified health or human services professional who has an active license or degree in accordance with the appropriate accrediting bodies (e.g., a licensed clinical social worker, psychologist, or counselor; Jegatheesan et al., 2014). Accordingly, progress is measured and tracked using standard clinical documentation (see Table 1.3.1).

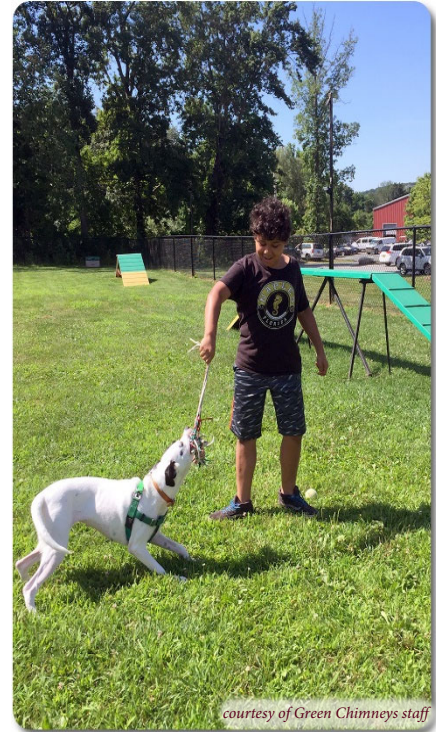
Animal-assisted therapy interventions that include animals in either a diamond model (i.e., where the professional, animal-handler, client, and animal are present and represent the four points in a diamond) *or* triangle model (i.e., where the professional also serves as the animal-handler) to meet the child’s individual treatment goals constitute much of Green Chimneys’ animal-assisted and nature-based programming. An example of animal-assisted therapy at Green Chimneys is the inclusion of equines and the Horse Barn environment to enhance a student’s motivation to engage in psychotherapy, and to support his or her treatment goals (i.e., equine-

assisted psychotherapy to promote self awareness and emotional regulation). For more information about the Equine Program, see Chapter 4.

Animal-assisted activity – The primary goal of AAIs categorized as an *activity* is to provide motivational, recreational, comforting, and/or leisure experiences that contribute to and enrich a person's general well-being (Jegatheesan et al., 2014). An activity is typically informal and not structured to meet specific treatment or educational goals, although the inclusion of animals is intended to be broadly therapeutic (e.g., feeling calm after petting a visiting therapy dog in the hospital). An animal-assisted activity may be delivered by a professional who has received AAI training or education specific to the activity and population served. Alternatively, the activity may be unsupervised or provided by a volunteer animal-handler. As animal-assisted activities

tend to be somewhat spontaneous in nature, progress is neither measured nor documented in a formal manner (see Table 1.3.1). A wide variety of animal-assisted activities are incorporated throughout Green Chimneys' campus and programming, such as spending unstructured time visiting horses, grooming cows, working on behavioral training with dogs, or simply observing other farm and wildlife animals.

Animal-assisted education – The purposes of an *educational* AAI are to enhance academic learning (Lieberman & Hoody, 1998) and to develop vocational skills through instruction that incorporates animals and their care. Such interventions are guided by pre-determined educational goals and/or a structured curriculum, and are delivered by an education professional



A good game of tug-of-war enriches the well-being of children and dogs alike.

who, at a minimum, has been trained in the pertinent subject matter and specific program protocols. Ideally, intervention providers will have a degree in education and relevant license(s). Progress is measured and documented in the form of grades or performance evaluation rather than clinical documentation (see Table 1.3.1). Green Chimneys' Learn and Earn program – where students develop important life and career skills by performing nature-based and caregiving tasks in exchange for a small stipend – represents an example of animal-assisted education, as do teaching a child conscientious pet care and including therapy dogs in early reading and literacy programs (Jegatheesan et al., 2014).

At Green Chimneys, many classes incorporate animals to increase student interest and engagement, and/or focus on the importance of animal care, proper handling practices, species-specific individual animal needs or behaviors, and animal sciences. As an example, Kaufmann, Kinoshita, & Teumer (2019) describe the following animal-assisted education application at Green Chimneys:

Division on a math sheet in a classroom environment is a stress inducer and a child may shut down without trying. Dividing baby carrots into equal amounts to feed to the bunnies, on the other hand, is a much more motivating task, and children are willing to try it without necessarily realizing that they are engaging in an academic goal (p. 253).

Terminology for the Domain of Horticultural-Based Interventions

Awareness of the positive benefits of humans connecting with plants (e.g., through gardens and other natural spaces) has grown considerably in recent years and, as a result, there has been an increased interest in, and appreciation of, HBIs (American Horticultural Therapy Association, 2019). This has led to HBI program expansion on a broad scale, including practitioners' use of various terms to describe horticulture activities (American Horticultural Therapy Association, 2019). Such terminology has been helpful in distinguishing between different types of programs

and in establishing training qualifications for facilitators. However, more standardization of terms is needed across the HBI field in order to decrease confusion when discussing various interventions and their intended outcomes.



For the *domain of HBI*, the criteria used to differentiate between therapy, activity, and education categories were developed primarily from the definitions put forth by the American Horticultural Therapy Association. In addition, these terms were supplemented with other commonly accepted definitions

used in the overall field of human-plant interactions (but not included in the definitions proffered by the Association). Accordingly, HBIs are organized into two broad categories: (a) horticultural therapy and (b) therapeutic horticulture. To establish consistency in the structure of terminology used across this report, the HBI category “therapeutic horticulture” is further subdivided into *horticultural activity* and *horticultural education*. These terms will be used throughout this documentation report.

Horticultural therapy – Leaders in the HBI field are currently working towards developing standard definitions of “horticultural therapy” and “horticultural therapist,” as well as specifying the different types of horticultural therapy programs that presently exist (American Horticultural Therapy Association, 2019). Haller and Capra (2017) define horticultural therapy as:

A professionally conducted client-centered treatment modality that utilizes horticulture activities to meet specific therapeutic or rehabilitative goals of its participants. The focus is to maximize social, cognitive, physical and/or psychological functioning, and/or to enhance general health and wellness (p. 6).

Led by a registered horticultural therapist, *horticultural therapy* interventions serve clients with identified therapeutic or rehabilitation needs, are guided by individual client treatment goals, and document progress toward those goals using clinical progression notes after each session (American Horticultural Therapy Association, 2019; Haller & Capra, 2017; see Table 1.3.1).

Horticultural activity – The aim of HBIs categorized as a *horticultural activity* is to provide general enrichment through interactions between humans and plants. Horticultural activities can be simple or complex in scope, with both practical and broadly therapeutic applications. For example, Green Chimneys students often participate in soil mixing activities, free play in the Sensory Mud Kitchen, and picking vegetables they grew from seed in the Educational Garden. These “therapeutic horticulture” interventions do not require a registered, certified, or clinical professional to directly conduct the activity (see Table 1.3.1). However, for the purposes of risk management, it is recommended that horticultural activities with children be lead by an adult with strong teaching and supervision skills.

Horticultural education – An *educational* HBI enhances academic and/or CTE instruction through interactions with plants and the natural world. Ohly and colleagues (2016, p. 3) describe the following activities as key components of garden education interventions: “preparing the soil, planting, weeding, watering, harvesting, and garden-related cooking and tasting activities.” Such “therapeutic horticulture” tasks can be integrated into the curriculum or conducted outside of class (e.g., during lunch breaks, after-school clubs focused on plant life, and/or school–organized trips to community garden allotments). Like animal-assisted



Students at Green Chimneys connect with nature and adult mentors through hands-on horticultural activities, such as planting seedlings and tending to garden beds.

education, horticultural education interventions are guided by pre-determined learning goals and/or a structured curriculum (e.g., lessons on botany, photosynthesis, environmental sustainability, and agriculture). Horticultural education programs are delivered by educators who have been trained in program-specific knowledge and skills, with progress being measured and documented in the form of grades or performance evaluation (rather than clinical documentation; see Table 1.3.1).

Terminology for the Domain of Natural Environments Interventions

NEI is a term that describes the broad utilization of the natural environment for the purposes of improving human health and well-being. Primarily, natural environments have been shown to: (a) provide settings and opportunities for physical activity; (b) support self-regulation and psychophysiological stress recovery; (c) lower depression and anxiety; and (d) increase focus (Bowler, Buyung-Ali, Knight, & Pullin, 2010). Much like AAIs and HBIs, NEIs are designed to complement traditional forms of therapy and learning. In order to be consistent in the use of terminology across this report, the NEI domain is further subdivided into *natural environments therapy*, *natural environments activity*, and *natural environments education*. As this is an emerging field, it is important to note the lack of common or accepted terminology used to differentiate between these three NEI categories. The definitions provided here, while based on existing bodies of work in the field of nature therapy (as well as the relatively limited NEI literature), have been largely developed by this report's authors to reflect the development and implementation of these interventions at Green Chimneys.

Natural environments therapy – This term refers to structured, individualized, and goal-directed interventions which seek to enhance a human's physical, cognitive, behavioral, and/or social-emotional well-being through meaningful interactions with the natural environment (Jordan, 2015; see Table 1.3.1). Also known as “nature therapy,” *natural environments therapy* incorporates nature as a “live and dynamic partner” that fosters the development of a safe space

and a strong therapeutic alliance between clinician and client (Berger, 2006, p. 268). Nature will often play a central role as “co-therapist,” in which the client engages directly with the natural environment (e.g., via building a fire or identifying wildflowers) while the therapist simply serves as witness or as a “container” (i.e., a space that forms boundaries) for the work (Berger, 2007, p. 6). Alternatively, some practices involve the therapist taking on a more active role by engaging the client in a traditional therapy session while using nature primarily as a supportive backdrop for the therapeutic work (Jordan, 2015).

Natural environments activities – Any informal interaction between a person and nature can be considered a *natural environments activity*. There are ample opportunities for students to engage in natural environments activities at Green Chimneys, such as walking along a nature trail or sitting in the Educational Garden, as well as participating in programs facilitated by the Recreation Department (i.e., kayaking on the Great Swamp or going on an offsite hiking and camping trip). Natural environments activities need not be facilitated by a licensed mental health professional; rather, they may be supported and supervised by any Green Chimneys staff member or volunteer (see Table 1.3.1).

Natural environments education – At Green Chimneys, elements of the natural environment are often included in *educational* programming to help students meet their specific academic goals (see Table 1.3.1). For example, students may participate in an outdoor activity in their PE class (e.g., engaging in team sports on Ross Field or the onsite climbing tower and ropes course) or via an indoor classroom lesson about



Ross Field serves as the site of many natural environments activities and educational programs. Here, staff from the Recreational Department help students learn the art of fencing.

the environment (e.g., learning about the impact of climate change, different ecosystems, or sustainable and respectful ways that humans can interact with nature).

1.4 Summary

Since 1947, the mission of Green Chimneys has been to empower children and youth to maximize their potential through the provision of residential, educational, mental health, and recreational services in a supportive nature-based setting. Each year, Green Chimneys serves more than 200 1st - 12th grade students with special educational, behavioral, and/or psychosocial needs through its renowned therapeutic day school and residential life programs. Staff provide youth with unique learning opportunities to nurture and engage with a complex, nature-rich environment that includes a working organic farm and gardens, animal barns and pastures, canine kennel facilities, a wildlife center, athletic fields, a nature trail, and a recreational challenge course.



Green Chimneys' specialized nature-based programming offers animal-assisted, horticultural-based, and natural environments interventions to help students cultivate positive and meaningful connections with family, staff, peers, community, animals, and the natural environment. Through a distinctive PYD treatment approach, nature-based therapies, activities, and educational programs (including SEL) at Green Chimneys seek to build each student's *competence, connections, confidence, character, and caring* for others. Concurrently, healthy and reciprocal social relationships with staff, interns, classmates, and animals support Green Chimneys students

as they learn and practice important life skills – both on campus and as members of their families, peer groups, and extended communities.

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Chapter 2:

Theoretical Foundations of Nature-Based Interventions and their Role in Promoting Healthy Development for Youth

2.1 A Developmental Approach to Human-Animal-Environment Interactions

Psychosocial development in youth has important and enduring impacts on their mental health, well-being, and capacity to care for themselves and others in adulthood (Beauchaine & McNulty, 2013; Eisenberg, Spinrad, & Eggum, 2010; Quinn & Fromme, 2010). Notably, the ability to self-regulate – or to manage emotions, thoughts and behaviors, especially in times of great stress or sorrow – represents a key component of healthy child and adolescent development (Aldao, Nolen-Hoeksema, & Schweizer, 2010; Bridgett, Burt, Edwards, & Deater-Deckard, 2015; Durlak, Weissberg, Dymnicki, Taylor, & Schellinger, 2011; McClelland, Geldhof, Cameron, & Wanless, 2015). An individual’s lack of self-regulation skills or competencies can have lifelong implications for his or her own health and quality of life, and often contributes to significant societal costs within educational, healthcare, and criminal justice systems (Bridgett et al., 2015; Guerra & Bradshaw, 2008).



Students share an important celebration with pregnant mini horse Maya — a baby shower for the mom-to-be, complete with a carrot cake and decorations.

The period of adolescence is marked by unique developmental challenges related to the formation and application of self-regulation skills. A myriad of emotional, cognitive, behavioral, and social changes are occurring, making it often difficult to mitigate emotional reactivity and responses to stress (Blakemore & Robbins, 2012; Casey, Duhoux, & Malter Cohen, 2010; Dumontheil, 2014;

McClelland et al., 2015; Powers & Casey, 2015; Sebastian, Viding, Williams, & Blakemore, 2010; Somerville & Casey, 2010). That said, the development of these skills are pivotal, as they have been shown to predict better social competence (Diener & Kim, 2004), support improved academic performance (Bridgett et al., 2015; Geldhof et al., 2013), contribute to healthy adjustment in adulthood (Penela, Walker, Degnan, Fox, & Henderson, 2015), and protect against internalizing and externalizing behaviors and symptomatology (Aldao et al., 2010; Casey et al., 2010; Wichstrøm, Belsky, & Berg-Nielsen, 2013).

Early theoretical approaches to youth development concentrated mostly on deficits, which led to treatment approaches that were problem-focused rather than strengths-based (Lerner et al., 2005; Lerner & Lerner, 2011). In contrast, the Positive Youth Development (PYD) framework conceptualizes development as being governed by mutually beneficial relationships between an adolescent's individual strengths and assets present within the surrounding environment (Lerner, 2006; Lerner, Bowers, Geldhof, Gestsdóttir, & Desouza, 2012; Lerner & Lerner, 2011). PYD's focus on youth strengths is similar to other developmental frameworks, such as Social-Emotional Learning (SEL) and the Social Competence model. However, PYD differs from these more skills-based approaches in its emphasis on the need for interventions that support pathways toward a continuum of thriving, rather than avoidance of maladaptive functioning based on universal or socially-constructed norms (Tolan, Ross, Arkin, Godine, & Clark, 2016). In the context of PYD, thriving is defined as:

An integrated moral and civic identity and a commitment to society beyond the limits of one's own existence that enable youth to be agents in their own healthy development and in the positive enhancement of other people and of society (Tolan et al., 2016, p. 172).

Here, development is agential, being actively driven by the individual, and thriving emerges through the dynamic relationship between youth and the specific bio-psycho-social contexts in which they are situated (Larson, 2000; Lerner et al., 2005; Tolan et al., 2016).

Fundamentally, the concept of PYD is rooted in Relational Developmental Systems Theory, a meta-theoretical framework that asserts human development is the result of bi-directional, integrated relationships between the individual and all aspects of his or her environment, including personal history (Lerner, Lerner, Bowers, & Geldhof, 2015; Mueller, 2014a; Overton, 2010). As a relational model, the framework is a departure from the linearity of traditional cause-and-effect, mechanistic approaches to understanding human health in development, such as attempts to reduce the integrated aspects of the developmental system to individual factors. Relational Development Systems Paradigm-based approaches emphasize the potential for “relative plasticity,” or systemic change across the lifespan as individuals shape, and are shaped by, these co-actional individual-context relations (Lerner et al., 2005; Lerner et al., 2015; Mueller, 2014a, p. 7). McClelland et al. (2015) note that the:

Relative plasticity of self-regulation is affected by biological, behavioral, and contextual factors, such as when temperamental predispositions and aspects of the context influence a child’s ability to regulate his or her thoughts, feelings, and behavior (p. 3).

Thus, according to Relational Developmental Systems Theory, self-regulation is a dynamic response to one’s context. Accordingly, the potential for positive development will ultimately correspond with the degree to which a child’s “self-regulated actions” align with the assets and resources within his or her context and environment (McClelland et al., 2015, p. 3).

Grounded in this framework, youth programs that use PYD approaches aim to promote positive development by fostering mutually beneficial relationships between a child’s individual strengths

and the assets present within his or her environment. When individual strengths and environmental or ecological assets align, positive interactions (known as “adaptive developmental regulations”) occur between individuals and their contexts, which advance the well-being of both the individual *and* his or her environment (Lerner & Lerner, 2011; Mueller, 2014a, pp. 7-8). As such, PYD interventions are centered on enhancing the “fit” between individuals and their contexts – the development of bi-directional, formative relationships (Tolan et al., 2016).

2.2 The Five Cs of Positive Youth Development

Research demonstrates that when a “goodness of fit” exists between the individual and his or her context, higher levels of the *Five Cs* of PYD – Competence, Connection, Confidence, Character, and Caring – are observed (See Table 2.2.1).

Lerner and colleagues (2005) emphasize that PYD programs are most effective at supporting a youth’s development of the *Five Cs* when they incorporate features of what are known as the *Big Three*:

1. *Positive and sustained relationships between youth and caring adults*
2. *Activities that build important life skills*
3. *Opportunities for youth to use these life skills as participants in, and leaders of, valued community activities*

Youth showing higher levels of the *Five Cs* demonstrate fewer social, emotional, and behavioral problems; reduced risk behaviors; and improved educational outcomes (Lerner et al., 2005; Lerner & Lerner, 2011).

Additionally, researchers have theorized that when youth embody the *Five Cs*, they are



more likely to contribute and behave altruistically toward themselves, family, community, and the institutions of civil society (Lerner & Lerner, 2011). Accordingly, youth integration of the *Five Cs* with daily activities and responsibilities can lead to the emergence of a sixth C – Contribution (Lerner & Lerner, 2011).

Table 2.2.1. Definitions of the Five Cs of Positive Youth Development (Lerner et al., 2005)

"C"	Description
Competence	Youth live in complex environments that include, but are not limited to, their families, peer groups, schools, extracurricular programs, workplaces, and places of worship. Positively developing youth must competently navigate these contexts and make the most out of the resources they provide.
Connection	Positive development occurs when youth are valued, integral members of their communities. For instance, they must be positively connected to their peers, families, role models, schools, and communities. These connections enable and empower youth to improve their own lives, as well as the lives of those around them.
Confidence	Youth gain a sense of confidence when they are able to successfully navigate their contexts. Confident youth believe they can overcome obstacles and have a meaningful impact on the world around them. They have an internal sense of overall positive self-worth and self-efficacy.
Character	Positively developing youth internalize and respect social norms, appreciate standards of proper behavior, and have a well-formed sense of right and wrong. These youth demonstrate a strong sense of moral and ethical character by acting appropriately, even when nobody else is around.
Caring	Positive development means more than acting in one's own interests. Thriving youth show empathy and sympathy for the feelings and experiences of others and believe that caring and compassion for those around them is essential.

Of the various PYD approaches, the *Five Cs* model is the only one supported with empirical evidence through the 4-H Study of PYD, a seven-year longitudinal study assessing the national 4-H Program, which seeks to assist youth in actualizing their full potential through experiential and hands-on learning opportunities (Lerner & Lerner, 2011). Results from this study indicate that youth who participated in 4-H programming demonstrated higher levels of the *Five Cs* (as well as

Contribution) than their non-4-H counterparts. Additionally, youth in 4-H consistently showed indicators of healthy living (e.g., healthier eating habits), improved educational outcomes (e.g., engagement in school), and interest and participation in science, technology, engineering, and mathematics (Lerner & Lerner, 2011). These findings, replicated across all seven years of data collection, suggest that youth development programs that use the *Five Cs* model of PYD, like those offered at Green Chimneys, can effectively integrate the interests and strengths of youth with contextual assets to promote positive development and overall thriving.

2.3 Human-Animal-Environment Interactions as a Context for Positive Youth Development

As discussed above, PYD and thriving emerge when individual strengths and ecological assets align. The PYD approach emphasizes the importance of a multitude of contextual resources that comprise the ecology of human development. Gestsdóttir, Urban, Bowers, Lerner, and Lerner (2011) note that developmental contexts “range from proximal settings, such as families, schools, and peer groups, through distal cultural and institutional influences and physical ecology” (p. 62). These often-overlapping systems set the stage for important relational exchanges, which may mediate processes such as youth abilities to self-regulate and, thus, shape the trajectories of their development.



Visiting the Teaching Barn offers students a stimulating environment in which to practice the Five Cs of PYD. This student appears to be making a connection with a young lamb.

Bowers and colleagues (2012) note that most PYD scholars have examined resources that exist within “socially defined” systems (i.e., family, school, neighborhood), which may have the unintended consequence of overlooking “subjective social contexts” or those relations that are self-selected by individuals (p. 299). Therefore, it is critical to consider relationships deemed

important by the participants themselves. This observation is notable, chiefly because it draws much-needed attention to the adolescent as an active agent in his or her own development, aligning with the bi-directional logic offered by Relational Developmental Systems Theory. Accordingly, Bowers et al. (2012) expand the ecological asset model's unit of analysis to examine the relationship between youth and important non-parental adults in PYD. These relationships can take place across many socially defined systems and are often mutually fostered. Recent research in this area indicates that naturally occurring, quality relationships between youth and important non-parental adults are positively associated with higher levels of intentional self-regulation, more hopeful attitudes toward the future, and development of the *Five Cs* of PYD (Bowers et al., 2012).

While Bowers and colleagues (2012) do expand the construct of ecological assets to include “subjective social contexts,” the authors’ focus solely on human relationships limits the model to the human domain, and does not address circumstances where youth may find meaning and support in their connections with non-human animals and the natural world. Therefore, it would be productive to move beyond this anthropocentric model by also considering the diverse and often instinctual relationships that youth share with animals and the natural systems within their individual social-ecological contexts. As Relational Developmental Systems Theory suggests, nature-based contexts play a significant role in the ecology of human development and, as such, it is salient to consider how human-nature and human-non-human animal relations might



influence developmental trajectories for children and youth, particularly those with special needs (Mueller, 2014a; Overton, 2010).

Existing research evidence suggests that activities based in human-animal interaction (HAI) may contribute to PYD outcomes

through the promotion of intentional self-regulation skills (Mueller, 2014b; Mueller, Geldhof, & Lerner, 2013); social skills (Mueller, 2014a; Mueller et al., 2013; O’Haire, McKenzie, Beck, & Slaughter, 2013; O’Haire, McKenzie, McCune, & Slaughter, 2014); and moral development (Melson, 2003; Rost & Harmann, 1994). One study that directly measured the relationship between HAI and PYD is the aforementioned 4-H Study of PYD (Mueller, 2014b), which included measures of HAI during the final year of data collection. This HAI-specific research involved a sub-sample of 567 participants from the larger 4-H Study who lived across the U.S. and were one-year post high school completion. Measures included structural features of HAI (i.e., the type of interaction, if any, participants had with animals), as well as the participants’ emotions and cognitions about animals (i.e., attitudes related to animal attachment, commitment, and moral issues). Instrumentation regarding the *Five Cs* of PYD (and Contribution), intentional self-regulation, and depression as positive and negative indicators of thriving were also administered (Mueller, 2014b).

Overall, findings from this study link HAI to the development of the *Five Cs* of PYD associated with thriving (Mueller, 2014b). Specifically, emotional attachment to an animal was positively associated with Connection, Competence, and Caring. Commitment to caring for an animal was also positively associated with Connection, Character, Caring and Contribution, and negatively associated with depressive symptoms. Additionally, both pet owners and individuals who participated in animal-related activities and/or HAIs had higher Contribution scores than those who did not. Although these findings are correlational and not causal, they provide initial support for the hypothesis that relationships with animals, and nature-based contexts more broadly, may contribute to positive trajectories of youth development.

While studies directly linking nature-based interventions (NBIs; including HAI) with PYD are scarce, findings from a growing body of research suggest that interventions in natural settings may lead to positive health and cognitive-behavioral outcomes, which may also enhance youth

competencies in self-regulation (Moeller, King, Burr, Gibbs, & Gomersall, 2018). See Table 2.3.1 for a summary of select research findings regarding the self-regulatory benefits of NBIs.

Table 2.3.1. Self-regulatory benefits of nature-based interventions

Finding	Source
<i>Decrease distress and arousal</i>	Barker & Dawson, 1998; Beetz, 2017; Lee, Park, Tsunetsugu, Kagawa, & Miyazaki, 2009; Lenderbogen et al., 2011; Li, 2010; Li et al., 2008; Melson, Schwarz, & Beck, 1997; Mueller, 2014b; Park et al., 2009; Park et al., 2011; Parsons, Tassinary, Ulrich, Hebl, & Grossman-Alexander, 1998; Ulrich, 1983; Ulrich et al., 1991; Wilson, Ross, Lafferty, & Jones, 2008
<i>Promote attention restoration</i>	Kaplan, 1995; Wilson et al., 2008
<i>Increase attentional control and flexibility</i>	Bowler, Buyung-Ali, Knight, & Pullin, 2010; Cimprich & Ronnis, 2003; Clatworthy, Hinds, & Camic, 2013; Faber Taylor, Kuo, & Sullivan, 2001; Kuo & Faber Taylor, 2004; Laumann, Garling, & Stormark, 2003; Louv, 2008; Tennessen & Cimprich, 1995; Wilson et al., 2008
<i>Broadly support elements of self-regulation</i>	Bridgett, Oddi, Laake, Murdock, & Bachmann, 2012; Geldhof, Bowers, Gestsdóttir, Napolitano, & Lerner, 2015; Nigg, 2017
<i>Reduce symptoms of depression</i>	Souter & Miller, 2007
<i>Decrease symptoms of anxiety and post-traumatic stress disorder (PTSD)</i>	O’Haire, Guérin, & Kirkham, 2015
<i>Improve social-emotional outcomes (e.g., increase attachment security, helping behaviors, and feelings of social support)</i>	Beetz, Kotschal, Turner, Hediger, Uvnäs-Moberg, & Julius, 2011; Beetz, Uvnäs-Moberg, Julius, & Kotschal, 2012; Julius, Beetz, Kotschal, Turner, & Uvnäs-Moberg, 2013
<i>Reduce attention deficit hyperactivity disorder (ADHD) symptoms</i>	Faber Taylor, Kuo, & Sullivan, 2001
<i>Increase positive affect (overall emotional well-being)</i>	McMahan & Estes, 2015
<i>Decrease cortisol levels</i>	Honold, Lakes, Beye, & van der Meer, 2016; Lee, Park, Tsunetsugu, Kagawa, & Miyazaki, 2009
<i>Improve stress response and recovery</i>	Brown, Barton, & Gladwell, 2013

2.4 Self-Regulation and Developmental Health

Regulation, a central feature of developmental health, involves adaptive internal and external processes that modulate emotion, cognition, and behavior to achieve a goal (Nigg, 2017). Self-regulation is intrinsic, and is influenced by the dynamic interplay of top-down, or conscious, processes (e.g., low-level cognitive control, high-level executive functioning) and bottom-up, or automatic, responses (Nigg, 2017). Throughout the lifespan, self-regulation skills develop with increasing complexity via a nonlinear “hierarchical cascade process...[such that] low level capacities assemble into more complex capabilities, congruently with development of physical and neural systems and the gradual internalization of control during childhood” (Nigg, 2017, p. 362). In other words, self-regulation competencies reflect milestones that are the result of increasingly complex neurological and cognitive assemblages associated with growth and development (Blair & Razza, 2007; Kochanska, 1997; Padilla-Walker & Christiansen, 2011; Spinrad et al., 2006).

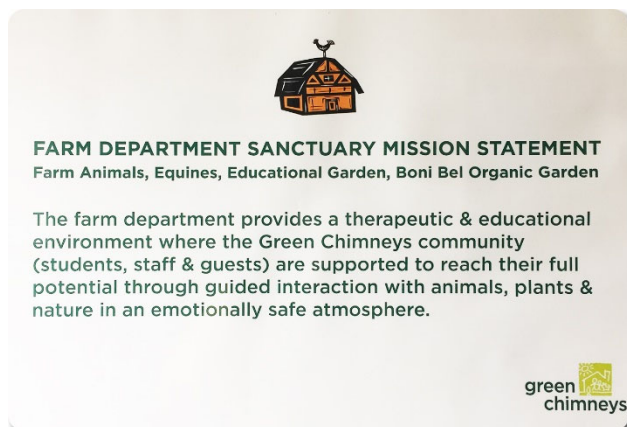


For more than a decade, two Bactrian (or two-humped) camels have lived at Green Chimneys. Phoenix and Sage provide students with extraordinary opportunities for human-animal interaction.

Because of its implications for a variety of psychosocial outcomes, self-regulation has been studied across a range of disciplines, including cognitive neuroscience, education, developmental science, and personality psychology. Depending on the author’s field of study, different definitions of self-regulation punctuate the literature, with scholars noting a considerable degree of confusion and “conceptual clutter” as a result (Morrison & Grammer, 2016, p. 327; Nigg, 2017). Executive functioning (Diamond, 2013); emotion, mood, and affect-regulation (Gross, 2015); impulsivity or impulse control (Madden & Bickel, 2010); and cognitive control (Botvinick

& Cohen, 2014) are all constructs that have been used to define elements or different domains of self-regulation; yet, as Nigg (2017) notes, there is little agreement on how these constructs or terms relate to, or differ from, each other.

Consequently, Nigg (2017) has proposed the following domain-general definition of self-regulation, which encompasses emotion, behavior, and cognition: "Regulation is the ongoing, dynamic, and adaptive modulation of internal state (emotion, cognition) or behavior, mediated by central and peripheral physiology" (p. 361). Nigg (2017) also specifies emotion regulation to be "any process that influences the onset, offset, magnitude, duration, intensity, or quality of one or more aspects of emotion response" (Nigg, 2017, p. 366). Self-regulation of behavior, or action, is defined as the "optimization of overt motor, ocular, or vocal response (excluding physiological changes) for purposes of adaptation," while self-regulation of cognition is the "modification of attention, memory, or working memory to try and enhance adaptation or achieve a goal in the absence of overt behavior or salient emotion regulation" (Nigg, 2017, p. 367). On the whole, "self-regulation" functions as an umbrella term for these three sub-domains, each of which are shaped by the interactions between our deliberate actions and involuntary responses. Because it comprises the interconnected processes of emotional, behavioral and cognitive regulation, this report will use Nigg's (2017) domain-general definition of self-regulation (see above) throughout the text.



Increasingly, scholars are focusing on the complex role that context plays in self-regulatory processes (Aldao, 2013; Aldao, Sheppes, & Gross, 2015; Bonanno & Burton, 2013; English, Lee, John, & Gross, 2017). This shift represents a departure from previous linear models (i.e., Gross' process model of

emotion regulation; Gross, 1998a), which have historically been referenced by scholars in an attempt to rank the adaptability of regulatory strategies. However, these models fail to account for the significant ways in which context and environment influence these trajectories of self-regulation and, therefore, overlook important generative dynamics that play a major role in the deployment of regulatory processes.

Bonanno and Burton (2013) warn that without considering the role of context in regulation strategy deployment, there is risk for what they term “the fallacy of uniform efficacy,” which assumes that regulatory strategies are themselves inherently beneficial or maladaptive (p. 592).



Increasingly, self-regulatory processes are understood to be more or less adaptive based on the extent to which they fit the reality of the context at the time they are employed. Indeed, these processes are mediated by a number of “demographic characteristics (e.g., age, gender, ethnicity, life stressors), personality facets (e.g., neuroticism) and dispositional and state-level psychological processes (e.g., trait affect, habitual use of strategies, mood),” as well as environmental contexts (Aldao, 2013, p. 158). In response to the growth in relational “person-situation interactionist” models (Cheng, 2001; Kashdan & Rottenberg, 2010, p. 866), Bonanno and Burton (2013) propose that “regulatory flexibility” is more indicative of positive or adaptive outcomes than repeated and/or rigid use of one regulatory strategy (p. 597). Regulatory flexibility includes having the ability to discern demands and opportunities in a given context (or context sensitivity), to select from a repertoire of strategies, and to gauge feedback and modify one’s response accordingly (Bonanno & Burton, 2013). In this way, regulatory flexibility connotes more nuanced self-regulation competencies essential for developmental health.

Among youth, the development of self-regulation skills represents both intellectual and psychosocial milestones (Blair & Razza, 2007; Kochanska, 1997; Padilla-Walker & Christiansen, 2011; Spinrad et al., 2006). Given the neurocognitive growth and vast psychosocial change that characterize childhood and particularly adolescence, these periods are typically marked by increased risk-taking and opportunities for self-regulation (Bariola, Gullone, & Hughes, 2011; Eisenberg & Morris, 2002; Steinberg, 2005). Problems with self-regulation, then, are often associated with mental health issues and the development of psychopathologies (Nigg, 2017). For instance, ADHD and other internalizing and externalizing issues (Calkins, Graziano, & Keane, 2007; Martel & Nigg, 2006; Olson, Sameroff, Kerr, Lopez, & Wellman, 2005; Wakschlag et al., 2012), addiction (Zucker, Heitzeg, & Nigg, 2011), depression (Wang, Chassin, Eisenberg, & Spinrad, 2015), and autism spectrum disorder (ASD) are all related to self-regulation challenges (Nigg, 2017). According to Nigg (2017), problems with self-regulation are, on the most basic level, associated with impulsivity, risk-taking, and behavioral disinhibition.

The processes of self-regulation inform an individual's ability to dynamically engage with their environment. With increased regulatory flexibility, a young person's capacity for imagining the future and working toward long-term goals contribute to their development of higher order



intentional self-regulation. Freund and Baltes (2002) operationalized intentional self-regulation via the Selection, Optimization, and Compensation model, which involves the deployment of regulatory strategies that contribute to the achievement of personal goals. While intentional self-regulation depends on the relatively immediate bottom-up and top-down processes of self-regulation (as described above), it also involves higher order emotional, behavioral, and cognitive processes that are involved when one conceives future possibilities and selects a goal, optimizes resources, and

compensates for failed attempts with goal restructuring (Freund & Baltes, 2002; Geldhof et al., 2014; Gestsdóttir, Lewin-Bizan, von Eye, Lerner, & Lerner, 2009). According to Gestsdóttir and colleagues (2009), when selection, optimization, and compensation strategies are “integrated effectively by a person within his or her ecology, [these strategies] provide an architecture for structuring adaptive relations between the individual and the context” across his or her lifespan (p. 586).

Social demands and neurophysiological changes mark the importance of early adolescence in the development of intentional self-regulation. During this time, neurobiological development - including changes in the prefrontal cortex, greater interconnectivity among brain regions, and increases in dopamine levels – provides the opportunity for increased cognitive control, especially in relation to long-term goals



Green Chimneys' 4-H program helps students set both short- and long-term goals, such as managing stress and gaining confidence when facing a challenging task (i.e., presenting an animal to visitors during community events).

(Steinberg, 2008). A developing sense of identity and personal sense of the future (Schmid & Lopez, 2011), as well as increasing social demands to set goals and problem solve challenges, are conditions that when paired with biological changes influence intentional self-regulation development in adolescence (Geldhof et al., 2014). When youth are unable to employ these self-regulation skills, they may experience increased social and psychological friction and/or struggle academically.

Research on the relationship between PYD and self-regulation has almost exclusively focused on intentional self-regulation. Specifically, current studies indicate that the intentional self-regulation skills of selection, optimization, and compensation predict PYD outcomes, such as the

development of the *Five Cs* (Gestsdóttir & Lerner, 2007; Zimmerman, Phelps, & Lerner, 2007). Gestsdóttir et al. (2009) note that “when the cognitive, emotional, and behavioral skill sets comprising each of the three components [selection, optimization, and compensation] are maximally developed, [they provide] a plastic array of complementary options for adaptation” (p. 586). Thus, when an individual develops self-regulatory skills that are flexible, he or she is more likely to engage with his or her context in a way that promotes adaptive developmental regulations (Geldhof, Little, & Colombo, 2010). Indeed, self-regulation skills allow for flexible interactions with a variety of contexts, which ultimately promotes adaptiveness and thriving. In 2013, Mueller and colleagues examined whether HAI was related to the development of self-regulation skills in 10th graders engaged in 4-H. They found that students who identified an animal-related experience as their most important or meaningful 4-H activity had different manifestations of self-regulation skill sets compared to those without these experiences or perspectives (Mueller et al., 2013). While exploratory, this study shows that HAI is an important contextual asset to explore in the development of intentional self-regulation.

Green Chimneys’ integrated use of the PYD treatment model is one example of how placing youth in a supportive, nature-based environment enables them to strengthen their self-regulation



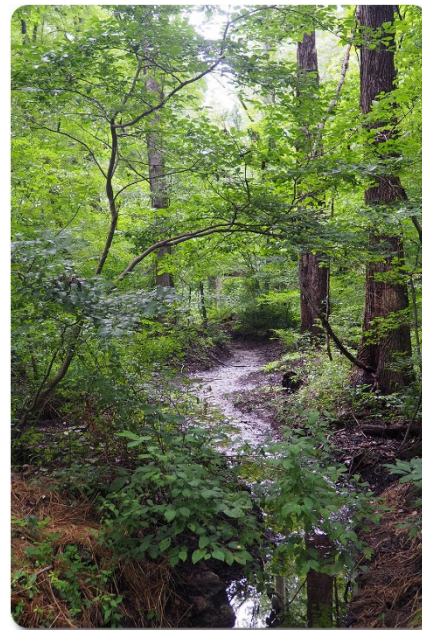
skills. Notably, Green Chimneys is unique in its application of PYD because most programs that use this approach, and the studies measuring their efficacy, are centered on non-clinical populations; the majority of students enrolled at Green Chimneys are there because they have been unable to self-regulate in more traditional educational settings due to social, emotional, behavioral, and learning challenges. Arguably, Green Chimneys’ nature-based programs are an important aspect of the overall environment that supports students’ abilities to self-regulate. Here, youth take part in, and

sometimes lead, a wide range of nature-based activities that help build critical life skills (Green Chimneys, 2019). Closely interacting with the natural environment and other living beings – such as animals in the Teaching Barn, the abundant sensory stimuli in the Educational Garden, and the Wildlife Center’s unique inhabitants – engages youth on both a cognitive and experiential-affective level. These contexts may play a key role in promoting increased self-regulation and, consequently, adaptive developmental regulations that contribute to trajectories of thriving.

2.5 Nature-Based Contexts and Processes of Self-Regulation

Self-regulation skills enable youth to successfully manage experiences of stress, distress, arousal and conflict, thereby helping them function effectively in the world. As noted earlier (see Section 2.4), breakdowns in self-regulation can lead to a number of internalizing and externalizing psychopathologies, which often impact an individual’s ability to function in the classroom and broader community (Nigg, 2017). Extant literature points to the efficacy of NBIs in reducing a range of psychopathological and psychophysiological symptoms (see Table 2.3.1).

A growing body of evidence indicates that an individual’s level of stress is a “causal and maintaining factor” in a large number of issues impacting mental health (Middlebrooks & Audage, 2008; Nilsson, Sangster, & Konijnendijk, 2011; Wilson et al., 2008, p. 32) and physical health (McEwen, 1998; Mitchell & Popham, 2008; Sluiter, Frings-Dresen, van der Beek, Meijman, & Heisterkamp, 2000). Thus, moderation of stress serves as an essential contributing factor to overall health and the prevention of illness (Takayama et al., 2014). Ample evidence suggests that passive encounters with nature-based contexts, as well as more intentional horticultural-based



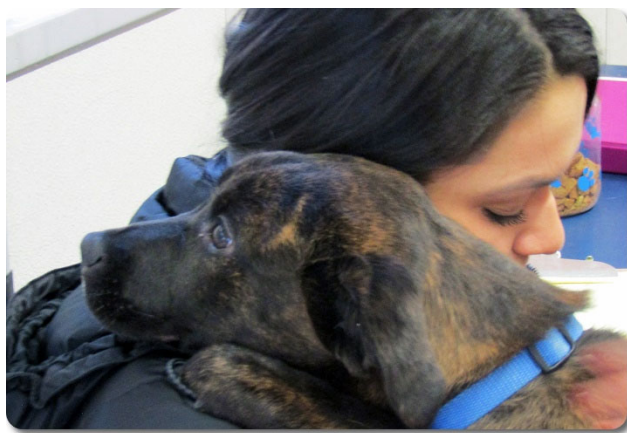
and animal-assisted interventions (HBIs and AAIs, respectively), are associated with the reduction of distress and arousal (Beetz, 2017; Mueller, 2014b; Ulrich, 1983), which, in turn, may have direct or indirect effects on self-regulatory processes.

In a study by Wells and Evans (2003), children in nature-rich conditions demonstrated less psychological stress when faced with stressful events as compared to their peers in low-nature conditions. This was especially true for the most vulnerable of children or those experiencing greater levels of stressful life events (Wells & Evans, 2003). Stress Reduction Theory suggests that nature ameliorates stress through the quality of being a non-taxing stimulus (Hartig, Evans, Jamner, Davis, & Garling, 2003; Hartig, Mang, & Evans, 1991; Kaplan, 1984; Ulrich, 1979; Ulrich, 1983). Often, merely viewing images of natural systems can induce calm; studies have shown that after experiencing an adverse event or stressor, research participants who watched images of landscapes tended to calm down within five minutes (Ulrich, 1981; Ulrich et al., 1991). Similarly, in their systematic review, Beetz and colleagues (2012) describe several studies that provided evidence to suggest that interactions with animals may help moderate human stress by reducing arousal and promoting positive emotions and psychosocial outcomes, such as reduced anxiety and depression and increased social interactions (Beetz et al., 2012). Regulation of stress, distress, and arousal during NBIs indicates that a variety of self-regulatory processes across emotional, cognitive, and behavioral domains may be involved.

The engagement of self-regulatory processes for the management of distress and arousal are represented in the well-documented physiological outcomes associated with NBIs. Indeed, exposure to natural environments is associated with lowered blood pressure (Heerwagen, 1990; Park et al., 2009), reduced muscle tension (Ulrich, 1981; Ulrich et al., 1991), and increased brain activity in the alpha frequency band (Lenderbogen et al., 2011; Parsons et al., 1998; Ulrich, 1981; Ulrich et al., 1991). More recent studies have also found smaller concentrations of cortisol, lower blood pressure and pulse, and higher levels of natural killer cell activity (indicative of healthy

immune function) in participants who were in contact with a forest environment (e.g., through walking or the inactive presence of) compared to those in an urban environment (Lee et al., 2009; Li, 2010; Li et al., 2008; Park et al., 2009; Park et al., 2011). These physiological impacts have been correlated with decreased sympathetic nerve activity and amplified parasympathetic activity, both of which promote overall relaxation (Sluiter et al., 2000).

The psychophysiological effects of AAIs for humans are also well-documented. One systematic review indicated that certain stress biomarkers – such as blood pressure, heart rate, and skin conductance – can become significantly lowered during or following HAI (Beetz et al., 2012). A meta-analysis of 28 articles found significant improvements to heart rate and self-reported stress and anxiety after exposure to animal-assisted therapy (Ein, Li, & Vickers, 2018). Furthermore, several studies have found that human endocrine stress responses were notably reduced, as measured through cortisol, epinephrine and norepinephrine, when participants interacted with a companion animal, specifically a dog (Barker, Knisely, McCain, & Best, 2005; Beetz et al., 2012; Cole, Gawlinski, Steers, & Kotlerman, 2007; Odendaal, 2000; Odendaal & Meintjes, 2003; Viau, et al., 2010). In other research, the presence of a dog significantly reduced the heart rate response of participants who were exposed to stressful stimuli, and more so than did the presence of a human friend (Allen, Blascovich, & Mendes, 2002). Beetz and colleagues (2012), as well as other scholars, have proposed that a boost in the “love hormone” oxytocin, which occurs in both human and non-human animals during AAI, may be at the heart of these positive psychophysiological effects that ultimately support the development of strong attachment between humans and their animal companions.



The physiological effects of NBIs suggest that self-regulation – particularly its involuntary and largely unconscious, bottom-up regulatory processes – is directly impacted by AAI. The bottom-up and top-down processes involved in self-regulation are intrinsically interconnected; the bottom-up processes serve to regulate, and are regulated by, the top-down processes (i.e., executive functioning and cognitive control; Nigg, 2017). That is, a continual feedback loop across domains of self-regulation comprises a web of mutually generative processes.

Physiological processes are involved in the co-occurring domains of self-regulation and, thus, physiological impacts of NBIs may support the self-regulatory processes that are associated with emotional, cognitive, and behavioral outcomes. To present evidence of NBI's impact on self-regulation, the research below is divided according to the three commonly referenced subdomains of emotional, cognitive, and behavioral impacts of NBIs.

Emotional Processes of Self-Regulation

Studies show that simply observing or encountering natural systems can reduce negative affect and increase positive feelings, as “negative thoughts are blocked and sympathetic arousal declines” (Wilson et al., 2008, p. 25). According to a 1983 text by Ulrich, when individuals encounter natural systems, positive emotional reactions related to safety and survival are often activated, creating an increased sense of relaxation, calmness, and well-being. Furthermore, studies on the emotional impact of HAIs indicate that increased social support facilitated by the human-animal bond is associated with reduced depression and anxiety, as well as the promotion of positive mood (Souter & Miller, 2007). Documented increases in oxytocin and attachment security (Beetz, 2017; Beetz et al., 2011; Nagasawa et al., 2015) and decreases in physiological stress (Barker & Wolen, 2008; Beetz et al., 2012; Odendaal & Meintjes, 2003; O’Haire et al., 2015) resulting from HAIs also represent important emotion-based elements and outcomes of these relationships. To be sure, outcomes related to emotional processes of self-regulation include behavioral and cognitive factors as well.

Cognitive Processes of Self-Regulation

Evidence suggesting that NBIs affect cognitive processes related to self-regulation is robust. These cognitive effects have been examined primarily through the lens of Attention Restoration Theory, which focuses on the roles of attention fatigue and arousal in cognitive functioning (Kaplan, 1995;



Wilson et al., 2008). Directed attention is an internal resource that is voluntarily accessed to perform goal-oriented tasks; it is also limited and requires effort, which can subsequently cause stress (Kaplan & Kaplan, 1989). When directed attention is depleted, individuals can experience what is known as “directed attention fatigue,” often leading to impulsive behavior, agitation, irritation, aggression, and an inability to concentrate (Kaplan, 1995; Kaplan & Kaplan, 1989, pp. 4-5). According to Attention Restoration Theory, attention is replenished and attentional capacity is restored when arousal is reduced (Kaplan & Kaplan 1989; Wilson, et al., 2008).

Kaplan (1995) posits that exposure to natural systems lowers arousal and attention fatigue. In contrast to directed attention, involuntary attention is non-goal oriented and effortless. It is often stimulated by casual encounters with thriving natural environments, which elicit experiences of “being away” from typical thoughts and activities; allow for “soft fascination” with elements available in the surrounding natural area; and lower stress and feelings of aggression (Kaplan & Kaplan, 1989, p. 3). Attentionally and emotionally restorative effects occur in a variety of settings that feature nature or natural elements, including wilderness environments (Gabrielsen & Harper, 2017; Hartig et al., 1991; Kaplan, 1984), prairies (Miles, Sullivan, & Kuo, 1998), forests (Morita et al., 2006; Park et al., 2011; Takayama et al., 2014), community parks (Bowler et al., 2010; Canin, 1991; Cimprich, 1993), nature window views (Brown, Barton, & Gladwell, 2013; Honold et al., 2016; Tennessen & Cimprich, 1995), and rooms with interior plants (Lee, Lee,

Park, & Miyazaki, 2015; Lohr, Pearson-Mims, & Goodwin, 1996; Nieuwenhuis, Knight, Postmes, & Haslam, 2014). Such restorative environments (i.e., those characterized by *healthy* plants and animals) are believed to be particularly important for individuals experiencing cognitive problems like poor attention, memory issues, and problem-solving difficulties (Clatworthy et al.,



2013; Louv, 2008). Profound improvements in pediatric cognitive functioning have also been documented after children moved from poor to better quality housing next to green spaces, even after the effects of improved housing had been taken into account (Wells, 2001).

Empirical evidence also suggests that natural areas can promote significant improvements in directed attention (Kaplan & Kaplan, 1989; Tennessen & Cimprich, 1995). For instance, interactions with nature help broaden one's attentional focus to include an increased flexibility and capacity to manage complex stimuli (Laumann et al., 2003). An exemplary study conducted in 2001 required participants to complete an activity designed to exhaust their capacity for directed attention. Individuals were then randomly assigned to spend 40 minutes either walking through a nature preserve, walking in an urban area, or quietly listening to music. Notably, individuals who walked in the nature preserve performed better on a standard proofreading task and reported more positive emotions and less anger than participants assigned to the urban walking or music listening groups (Hartig, Kaiser, & Bowler, 2001). Other studies have found that green outdoor spaces promote creative play, improve children's access to positive adult interactions, relieve symptoms of attention-deficit disorders, and improve concentration (Cimprich & Ronis, 2003; Faber Taylor et al., 2001; Kuo & Faber Taylor, 2004; Louv, 2008; Wilson et al., 2008). In contrast, indoor activities (i.e., watching television) and outdoor activities

in non-green, paved areas have been shown to increase symptoms of ADHD in children (Kuo & Faber Taylor, 2004; Louv, 2008).

Likewise, interacting with animals has been linked to increased attentional control and flexibility, both important pre-conditions for learning and motivation (Beetz, 2017; Beetz et al., 2012; Gee, Church, & Altobelli, 2010a; Gee, Crist, & Carr, 2010b; Gee, Sherlock, Bennett, & Harris, 2009; Zisner & Beauchaine, 2016). For example, Gee, Harris, and Johnson (2007) found that having a dog present with typically and non-typically developing children while performing a task resulted in faster and more accurate motor skills; when the dog was present, non-typically developing children performed with the same accuracy as their typically developing peers. Gee and colleagues (2007) speculate that the dog served to motivate and reduce stress in the young participants, which led to increased attention during task execution. Other studies have shown that, in the presence of a dog, children need fewer prompts when completing memory tasks (Gee et al., 2010b), make fewer errors (Gee et al., 2010a), and pay more attention to their teacher (Kotrschal & Ortbauer, 2003) than when engaged in these same activities alone.



As discussed above, specific research also suggests that “aggression may increase with mental fatigue and decrease with its recovery” (i.e., via engaging with natural settings; Kuo & Sullivan, 2001 p. 545). In fact, mental fatigue may help explain differences in aggression when comparing urban and rural settings (Fingerhut, Ingram, & Feldman, 1998), as well as the relationship found between aggression and certain elements of urban environments, such as crowding (Ani & Grantham-McGregor, 1998; Nijman & Rector, 1999; Palmstierna, Huitfeldt, & Wistedt, 1991) and noise (Donnerstein & Wilson, 1976; Gaur, 1988; Geen & McCown, 1984; Sherrod, Moore, &

Underwood, 1979). In a recent study comparing the design of psychiatric wards, Ulrich, Bogren, Gardiner and Lundin (2018) found that physical restraints due to aggressive behavior decreased by 50% among patients when they were moved to a facility featuring higher daylight exposure, nature artwork, nature window views and garden access (i.e., “biophilic design”), among other “stress-reducing environmental features” (e.g., reduced crowding and noise; p. 58).

Behavioral Processes of Self-Regulation

Studies also indicate that NBIs can affect regulatory processes associated with behavior. For instance, HAIs have been shown to stimulate social interactions between humans and prosocial behaviors in both clinical and non-clinical populations (Beetz et al., 2012; Eddy, Hart, & Boltz, 1988; Marr et al., 2000; Martin & Farnum, 2002; Sams, Fortney, & Willenbring, 2006; Wells, 2004). Likewise, exposure to natural environments and their attentionally restorative qualities can positively impact human behavior. For instance and as discussed previously, mental fatigue seems to increase aggression and other externalizing behaviors through its effects on cognitive processing, decreased impulse control (Kuo & Sullivan, 2001), and emotion (e.g., heightened irritability; Coccaro, Bergeman, Kavoussi, & Seroczynski, 1997; Kant, Smith-Seemiller, & Zeiler, 1998; Kavoussi & Coccaro, 1998; Stanford, Greve, & Dickens, 1995). Early research by Kuo and Sullivan (2001) found significantly lower levels of aggression and violence among individuals with greater access to natural environments near their home than among those with less access to nature in their immediate surroundings. Overall, because natural environments contribute to the restoration of attention, they may also promote the reduction of aggressive and other externalizing or negative behaviors.

2.6 Social-Emotional Learning as a Scaffold for Positive Youth Development

A common challenge among students at Green Chimneys is experiencing difficulty with emotional self-regulation. Integrating SEL into special education curricula can help students

cultivate and maintain positive social interactions and stable relationships. In fact, special educators and other teachers are increasingly being encouraged to include SEL in their lesson planning as a way to prevent bullying and/or counteract its negative effects (Office of Special Education and Rehabilitative Services, 2013; Rutherford Turnbull, Wilcox, Turnbull, Sailor, & Wickham, 2001). The Collaborative for Academic, Social, and Emotional Learning (CASEL; 2017a) is an advocacy leader in the research, practice, and policy implementation of SEL for children in grades K-12. CASEL (2017b) stipulates the five core competencies of SEL as:

1. *Self-awareness*
2. *Self-management*
3. *Responsible decision-making*
4. *Relationship skills*
5. *Social awareness*

Of note, these SEL competencies align strongly with the *Big Three* and *Five Cs* of PYD (Lerner et al., 2005), which are discussed further and in greater depth in the forthcoming chapters.

Research conducted by Catalano, Berglund, Ryan, Lonczak, and Hawkins (2004) suggests risk and protective factors present in the home, community, and the environment affect a student's emotional development. In addition, a recent meta-analysis conducted by Taylor, Oberle, Durlak, and Weissberg (2017) described predictable connections between SEL and PYD that have favorable long-term effects on students. According to this research, SEL lays the foundation upon which PYD further builds through experiential opportunities, adult support and guidance, and self-sufficiency training (Taylor et al., 2017). The enhancement of these assets through PYD approaches can promote positive behaviors and prevent the development of subsequent problems (i.e., conduct problems, emotional distress, and substance use; National Research Council and Institute of Medicine, 2009). Taken together, SEL and PYD can be an influential and positive behavioral intervention for youth.

Social-Emotional Learning as an Evidence-Based Intervention in Special Education

The advent of SEL interventions is proving to be an effective tool in special education programming. Notable progress is being made in SEL research and in SEL intervention protocols. The Protocol for Reviewing Interventions for Students with a Specific Learning Disability was created by What Works Clearinghouse, which serves as a repository of research on evidence-based educational interventions under the U.S. Department of Education (National Center for Education Evaluation and Regional Assistance, Institute of Education Services, 2019a). This resource provides educators, administrators, and researchers with the guidelines What Works Clearinghouse uses to analyze and approve studies. It includes 12 areas of educational outcomes, 4 of which are related to SEL competencies: (a) *problem behavior* (which functions as a barrier to social and academic development); (b) *school engagement* (i.e., daily attendance, time on task, dropout rates); (c) *self-determination* (i.e., creating and achieving goals, problem-solving, self-advocacy, choice-making), and (d) *social-emotional competence* (i.e., self-awareness, social-awareness, social skills, relationship skills, self-regulation, self-perception, self-management, social engagement, adaptive functioning; National Center for Education Evaluation and Regional Assistance Institute of Education Services, 2017). Largely, the evidence-based intervention research field has grown to include assessments that support the impact of SEL interventions for the academic success of students enrolled in special education programming.

Social-Emotional Learning in Special Education Research

Research in special education provides promising evidence that SEL and social skills instruction can help students with emotional disturbances (ED), ASD, and learning disabilities (LD) gain positive regard for themselves and others, and potentially increase their level of engagement in the classroom (Adams, 2013; Lane, Carter, Pierson, & Glaeser, 2006; Milsom & Glanville, 2010; Taylor et al., 2017). A systematic review of 26 studies conducted in 2002 found that

approximately three out of four children identified with emotional and behavioral disorders experienced significant language deficits (Benner, Nelson, & Epstein, 2002). Over ten years later, a 2013 study presented a group of students with emotional and behavioral disorders with a district-supported SEL intervention that used emotion-based vocabulary, consistent social



After observing animal behavior in the Teaching Barn, Green Chimneys' clinical staff often encourage students to reflect on the interactions they have seen in order to increase the students' social and self-awareness.

language centered on decision-making and perspective taking, and eventual practice of cumulative skills in small groups (Adams, 2013). Results showed the SEL intervention helped students with ED and ASD make gains toward meeting the functional social-emotional goals in their individualized education programs (IEPs) due to consistency, practice, and the time given to apply the emotional vocabulary to a social skill (Adams, 2013). This study highlights the successes that students identified with ED and ASD who have deficits in receptive language can make when an SEL intervention is applied.

Compared with their peers, students who have ED and LD are more likely to experience academic deficits (Lane et al., 2006). Moreover, research indicates that high school students identified with ED and LD are at an increased likelihood of experiencing negative post-school outcomes related to dropout, incarceration, and workforce challenges (i.e., unemployment and/or under employment; Lane et al., 2006). A study by Milsom and Glanville (2010) analyzed data from the National Longitudinal Transition Study–2 and parent self-reports, and found that students (grades 7 to 12) identified with ED and/or LD who utilized “cooperation” as a social skill experienced increased academic success and more positive engagement with peers and teachers than students who did not cooperate socially. Similarities and differences between sample students with ED and LD indicated that, while both populations experienced poor

interactions with peers, students with ED had a particularly difficult time in social situations. Likewise, students with LD tended to have more self-control over their behavior than those with ED (Milsom & Glanville, 2010).

While this study did not promote an SEL intervention per se, it did identify “cooperation” as the most salient social skill that students with ED and LD need in order to navigate the social system of an inclusive school setting (Milsom & Glanville, 2010). Looking forward, social skills (e.g., cooperation, self-control, and social assertiveness) should arguably be addressed in a standardized school-wide curriculum that promotes SEL competencies within a universal design (CASEL, 2017c). The broad use of an SEL curriculum would not only support the specific social and emotional development of those diagnosed with ED and LD, but would also provide all students with an opportunity to engage in social skills that contribute to prolonged academic and social-emotional success.

Social-Emotional Learning at Green Chimneys

As a member of the National Association of Private Special Education Centers, Green Chimneys abides by National Commission for the Accreditation of Special Education Services section standards 114 and 119, thereby promoting the teaching of social-emotional skills (National



Working together in the Garden fosters important social-emotional skills, such as cooperation and sustained positive interactions with peers and others.

Commission for the Accreditation of Special Education Services, 2017). As discussed in Chapter 1, Green Chimneys is currently in the process of implementing a School-Wide Positive Behavioral Intervention and Supports (SWPBIS) program (S. Klee, personal communication, August 21, 2017), which will provide a systematic three-tiered approach to assisting school administrators and students in

collectively adopting a supportive culture built on positive behaviors (PBIS, 2017a). Tier 1 describes SWPBIS for the school population as a whole, Tier 2 targets an identified group of students who are not responding to Tier 1 interventions, and Tier 3 focuses on the behavioral support needs of individual students with patterns of highly disruptive or dangerous behavior (PBIS, 2017b). Green Chimneys anticipates that increased positive behaviors will translate into improvements in other aspects of a student’s life, including in “personal, health, social, family, work, and recreation” areas (PBIS, 2017b, para. 1).

In 2010, CASEL released a brief entitled, *Social and Emotional Learning and Positive Behavioral Interventions and Supports*. This document reviewed the practical similarities between SEL and SWPBIS interventions, and noted that both (a) require a holistic community approach for successful long-term gains, and (b) flourish in schools where safe spaces are created to observe, practice, and engage in community-building social skill exercises. While SWPBIS is a framework that builds on students’ strengths to deter learned negative behaviors, it does not prescribe a specific curriculum – SEL or otherwise. Instead, an evidence-based SEL curriculum may be selected by school leadership to complement and support the overall SWPBIS programming, based upon the individual needs of the school and its students.

Research indicates that students with ED and/or LD are successful in generalizing social skills when they feel supported by teachers (Milsom & Glanville, 2010), thereby impacting their learning and the grades they earn in school. At Green Chimneys, modeling of positive behaviors for students is undertaken by all staff members, from educators to therapists to barn managers. In particular, Green Chimneys’ teachers actively encourage positive interactions and supportive mentorships with their students by highlighting SEL and other strengths-based educational activities.

SEL can be readily observed throughout the Green Chimneys campus, and often varies according to student age and stage of development, as well as mental health, behavioral, and educational needs. Over their time at Green Chimneys, young children with sensory processing issues (i.e., those stimulated by low to moderate sensory input) often demonstrate the five core competencies of SEL. For instance, students exhibit *self-management* and *responsible decision-making skills* by adhering to their homeroom expectations of positive behavior and respect for others during their outdoor education classes; just as they do in homeroom, students who participate in outdoor nature-based learning are asked to raise their hand if they have a question and to first consider whether their question is relevant to the current topic of discussion. Likewise, the development of *relationship skills* is evident in children who verbally express respect and affection for their homeroom teacher, teaching assistants (TAs), and/or resident animals. Dysregulated students show *self-awareness* when they are able to calmly return to their schoolwork after working with their teacher on individual behavior prompts and coping methods, such as visiting with camels or walking through the Garden. Finally, young children at Green Chimneys often demonstrate *social awareness* by confidently sharing their emotional state and asking for help when they feel uncertain or make a mistake.

Likewise, older Green Chimneys students with high sensory needs also regularly demonstrate social-emotional growth in the classroom. For example, *social awareness* and *relationship skills* may be observed at the beginning of an outdoor education class during the daily “compliment



Green Chimneys' commitment to helping students develop self-regulation skills is reflected in this poster reminding staff and volunteers to lead by example.

giving” exercise. When asked to give a classroom peer or teacher a compliment, youth often share specific examples of how that person exemplifies the compliment or strength. Additionally, student *self-management* is facilitated when youth are given the option of participating in a SmartBoard math exercise by either sharing their work on the classroom board or from their seat. This exercise also incorporates *self-awareness*, as students are encouraged to check in with themselves to decide whether they are comfortable sharing their answers in front of the class. For youth with high sensory needs, this process asks them to identify how they are feeling mentally and emotionally, while also connecting those feelings to their physical body. Moreover, youth at Green Chimneys are always encouraged to engage in safe, respectful, and *responsible decision-making* when working with resident animals and garden areas across campus. The value of having opportunities to practice and observe social-emotional skills in an encouraging, nature-based learning environment like Green Chimneys cannot be overstated.

2.7 Career Technical Education and Learn and Earn Programs

Students who have an IEP at Green Chimneys are required by the Individuals with Disabilities Education Act (IDEA) to have a transition plan (New York State Education Department or NYSED, 2011). The transition plan requires a team (comprised of the student, his or her family, and an educational specialist) to prepare the student for life after school by discussing and setting post-secondary goals. These discussions allow the team to prepare the student for success by planning the necessary actions needed to achieve his or her individual goals, such as gaining community experience and identifying specific employment objectives (NYSED, 2011). Overall, the focus of these planning activities is on building vocational, social, and self-sustaining competencies to increase the student’s autonomy and independence. The secondary transition plan begins when the student is 15 years old, and allows him or her to continue to receive special education until the age of 21 (NYSED, 2011). Throughout the transition process, teaching

students social skills and preparing them to be self-determined members of their communities are considered key priorities (IDEA, 2015).



Students and staff develop mutually beneficial relationships during Learn and Earns. Here, a Teaching Barn staff member debriefs a work session with a student and helps him fill out his time sheet.

In an effort to support this process and the development of each student's social and practical skills, Green Chimneys offers opportunities for youth to participate in career technical education (CTE) while they complete their academic requirements. This training builds experience and essential skills in a variety of work environments, thereby supporting the successful transition from an educational setting to the workforce and

greater community. In particular, Green Chimneys' Learn and Earn programming has provided students with important vocational and life-skills training for over 25 years. Learn and Earns offer students of all ages individual mentorship opportunities by pairing them with staff, interns, and/or long-standing volunteers for jobs based on the farm and in the school. Learn and Earn jobs tend to follow the schedule of Green Chimneys' intern cycles: either January through August or September through December. However, if an intern chooses to stay for both terms, the student could potentially be paired with the same intern for an entire year, as long as the relationship and job are going well. During 45-minute weekly sessions, students engage in developmentally appropriate tasks with the help of their mentors, learning the professional skills necessary to meet the requirements of the job and earning a small compensation upon task completion. Students are provided with task reminders; visual calendars, images, and/or charts; and positive encouragement from adults so that they can meet their Learn and Earn responsibilities and gain real-world working experience.

Learn and Earn jobs take place on campus at the Teaching and Horse Barns, as well as within the canine, wildlife, and HBI programs (see page 12). There are also seasonal Learn and Earns at the nearby Boni-Bel Farm and Country Store, as well as with the farm's groundskeeper. In the school setting, mainly high school students work in secretarial and assistant positions, with some students performing kitchen-related tasks in the cafeteria. A complex scheduling and coordination system, overseen by the Farm Education and Program Manager, enables Learn and Earns to occur across the entire campus throughout the school day, as well as prior to and after school for residential students. Students who live on campus may also participate in Learn and Earns on weekends, often for longer periods of time. Currently, 90% of students participate in the Learn and Earn program, although it is an opportunity available to almost everyone. Students may not participate in a Learn and Earn for a variety of reasons, including lack of interest, involvement in other program areas on campus (e.g, high school students may hold CTE positions), or missing the Learn and Earn enrollment period. On rare occasions, the Learn and Earn program may reach capacity, as there may not be enough mentors available to meet with all students.

Learn and Earns are both therapeutic and educational insofar as they foster positive, one-on-one relationships between students and respected adult mentors; encourage life-skills building activities based on individual student needs, goals, and interests; and challenge students to develop practical and essential vocational skills. In some cases, students participate in the Junior/Senior Student Mentorship Program, an advanced adjunct Learn and Earn activity where older youth engage with their younger peers by modeling prosocial behaviors with the guidance of an intern, staff member, or volunteer. This program is reserved for older students who have excelled in the Learn and Earn program and demonstrated the appropriate social-emotional and leadership skills needed to mentor a younger student. The mentor has the responsibility of not only teaching the mentee the essential elements of the job, but also of serving as an example of positive stewardship across campus. Through this program, the mentor gains leadership skills

and confidence, while the mentee learns how to follow directions, meet modeled behavior expectations, and respect the program area rules that ensure the safety of students, staff, animals, and the natural environment. In addition to earning a Learn and Earn stipend, the mentorship role counts as community-based service learning hours, which may meet New York State's graduation requirements (M. Kinoshita, personal communication, July 25, 2017).



Learn and Earns provide students with an opportunity to build problem-solving skills in a supportive environment. For example, placing a feed bag on a tall Clydesdale can be a challenge for many children and youth. Here, a student finds a creative solution by climbing the pasture fence to reach the horse's nose, while being spotted by an Equine Program Intern.

In critical ways, Green Chimneys' Learn and Earn program incorporates the *Big Three* characteristics of PYD-based programs: (a) positive and sustained adult-youth relationships, (b) opportunities for youth to build important life-skills, and (c) the use of life skills via youth participation and leadership in valued community activities. The emphasis on deepening the one-to-one mentor relationship allows students to develop positive attachments with non-parental adults, while also connecting with animals, plants, and nature. As discussed earlier in this chapter, studies indicate relationships with non-parental adults may contribute to positive developmental outcomes, such as increased intentional self-regulation and a hopeful future orientation (Bowers et al., 2012). Furthermore, students are able to build connections with the environment when they feel they are supported, safe, and cared for (Preece, 2009). While many

of Green Chimneys' students experience behavioral challenges, EDs, and/or LDs, this program fosters unique forms of experiential learning – often within novel, nature-based contexts – that reinforce academic goals. The development of life skills is emphasized through encouraging students to take responsibility, recall important information, approach situations and living beings with respect and thoughtfulness, and engage in physically and cognitively challenging tasks.

Informally, Learn and Earns incorporate pedagogies that are project- and problem-based. These approaches may be productive for students with LDs as they facilitate prosocial behaviors like collaboration and increased feelings of self-determination (Filippatou & Kaldi, 2010). For instance, Kincaid and Jackson (2006) noted a decrease in stereotypy and increase in positive behaviors and motivation among their students in special education who were engaged in project-based learning. Through focusing on specific projects, students are given the tools to fully immerse themselves into dissecting and solving problems while using a variety of visual, kinesthetic, oral, aural, social, and logical cues and modalities (Kincaid & Jackson, 2006). Problem-based learning is comprised of a hybrid of modalities and, depending on the sensory needs and abilities of the students, Learn and Earns can be tailored specifically to each student. In this way, project- and problem-based learning is highly associated with increased motivation (Filippatou & Kaldi, 2010).

Moreover, Learn and Earns provide vital CTE as they require students to: (a) willingly engage in work-related tasks, (b) take responsibility for their actions, (c) plan and prepare for the task at



Having a sense of responsibility for the most basic needs of another being, such as making sure the shelter dogs have enough water, can make the Learn and Earn experience meaningful and fulfilling.



hand, (d) commit to completing a job or project over the long-term, and (e) learn to manage their earnings. Overcoming the inevitable obstacles that take place when learning a new skill ultimately provides students with a sense of mastery, thus building their self-esteem. While the

overarching goal of Learn and Earns is to provide helpful and supportive activities that address students' main goals, this program also serves an important peripheral function of reducing class size while students are away working on their Learn and Earn task(s), thereby providing classroom teachers with more time and space to work individually with remaining students. In this way, the program is intended to be mutually beneficial for both students and staff.

Because of the program's individualized focus, pairing students with the right mentor and within the most beneficial context is an essential but complex process. For jobs on the farm, the Farm Education and Program Manager spends time getting to know interns during their initial training. She then visits each classroom, observing students and discussing their specific needs and goals with teachers. Finally, she reads each student's IEP to gauge his or her individual educational goals. With this information, she formalizes a schedule that also takes into consideration the student's work environment preferences. The goal is to place a student with an intern who is a good fit and in an environment that is positive and enriching. For instance, a child who tends to become overstimulated might be placed in the Educational Garden, whereas a student who is able to more consistently self-regulate may work in the Teaching Barn, a comparatively more stimulating setting. In this way, scheduling and placement help ensure the right fit and optimal outcomes for the student, animal(s), and environment.

2.8 Summary

PYD, rooted in the meta-theoretical framework of Relational Developmental Systems Theory, is an innovative, strengths-based, and youth-driven developmental approach to understanding and promoting trajectories of thriving. According to this framework, human development is highly influenced by the relationships that exist between an individual and his or her environment. When the strengths and interests of an individual align with the assets present in his or her ecological and/or social contexts (especially those that incorporate or model elements of the *Big Three* of PYD), mutual relational benefits are likely to occur. For youth, these benefits may include the development of higher levels of the *Five Cs* of PYD (Competence, Connection, Confidence, Character, and Caring), leading ultimately to Contribution to their well-being and that of others (or the Sixth C), intentional self-regulation, and hopeful orientation towards the future. Although researchers have examined self-regulation (particularly intentional self-regulation) in relation to PYD, relatively few have studied self-regulation through the lens of PYD in nature-based environments or in contexts where human-non-human animal relationships are of focus. As the ability to self-regulate is a key component of developmental and mental health, additional research in these areas is needed.



Currently, robust evidence suggests that NBIs – whether active (e.g., regularly tending to herbs growing in a garden) or passive (e.g., observing fish and the flow of water in a brook) – have broad emotional, behavioral, and cognitive benefits for human health and well-being, as they are associated with the regulation of stress, distress, arousal, and conflict. Likewise, SEL may also be enhanced through nature-based programming, which has positive implications for students’

engagement in school, as well as their ability to form and sustain social connections and live independently and with autonomy. Green Chimneys' Learn and Earn program is but one example of how students can gain vital vocational, leadership, relationship, and caregiving skills, all of which prepare them for a successful and happy road ahead in the context of doing something in nature that brings joy and fulfilment. However, studies have not yet examined the precise mechanisms of change driving these positive outcomes. Green Chimneys is uniquely positioned to serve as an important research site to better understand how the immediate processes of self-regulation are related to long-term youth development, specifically within nature-based contexts.

2.9 References

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PART II

ANIMAL-ASSISTED INTERVENTIONS AT GREEN CHIMNEYS



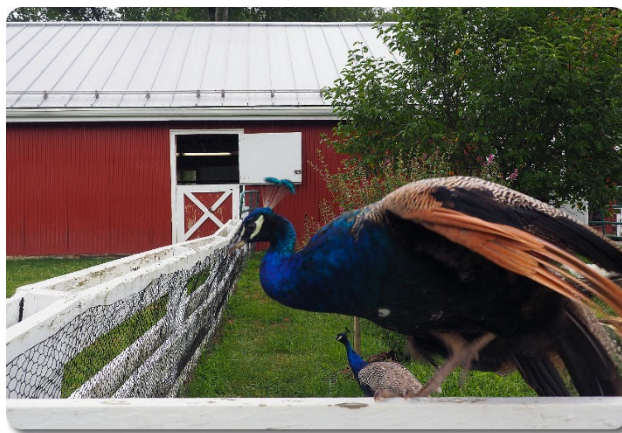
The greatest pleasure of a dog is that you may make a fool of yourself with him, and not only will he not scold you, but he will make a fool of himself, too.

—Samuel Butler, poet

Chapter 3:

Animal-Assisted Interventions at Green Chimneys

Human-animal interactions (HAIs) are thought to provide an important foundation for enhancing positive youth development (PYD), learning, and overall well-being for young people. Animal-assisted intervention (AAI) is used as a broad umbrella term to describe interventions that incorporate animals for the primary purpose of improving human health and well-being. Indeed, a myriad of studies provide promising evidence suggesting a link between participation in AAIs and improved youth competencies in emotional, cognitive, behavioral, and self-regulatory skills (see Chapter 2 for a detailed discussion of these concepts).



3.1 Introduction

Since its inception, the cornerstone of Green Chimneys' programming has been to promote positive and healthy connections between youth, animals, and the natural environment. Over 200 non-human animals are incorporated into the special education and treatment milieus at Green Chimneys to enhance experiential learning and foster psychosocial wellness for students. In turn, participating animals receive a high level of care with thoughtful consideration for species-specific and individual needs that they may not have received previously or in other settings. Clinical approaches to treatment are tailored to support the individual strengths and needs of every Green Chimneys student. With such a diverse range of animal species living on campus, teachers and therapists are able to plan and customize AAIs with the intention of

enhancing each student's academic, therapeutic, and developmental trajectories, both directly and indirectly (Green Chimneys, 2019a).

The main Green Chimneys campus, located just over 50 miles northeast of New York City, was purchased by Dr. Samuel B. Ross, Jr.'s father in the autumn of 1947 when Dr. Ross was just 19 years old. Within a year, Dr. Ross' dream of opening a "school on a farm with animals and children being raised together" (Ross, 2011, p. 8) became a reality when Green Chimneys School for Little Folk opened its doors as an operational boarding school with 11 students aged 3-6 years (Green Chimneys, 2019a). Initially, Green Chimneys sought to serve preschool children largely from families of middle and upper socioeconomic status who traveled or could not take care of their children (Ross, 2011). However, as the school expanded its scope and student population, services became increasingly specialized in the treatment and education of children with special needs (Green Chimneys, 2019a). Because the property was originally a working dairy farm, infrastructure for the housing and care of animals was already established. At first, Green Chimneys raised livestock on campus with the intention of providing meat and poultry to feed the students. However, as staff began to recognize and appreciate the therapeutic roles of the animals for students, the practice of raising animals for consumption ceased. As Dr. Ross noted in his 2011 book, *The Extraordinary Spirit of Green Chimneys: Connecting Children and Animals to Create Hope*, "We do not eat our therapists!" (Ross, 2011, p. 47).

Horseback riding was the first established animal-assisted activity included in the Green Chimneys curriculum. According to Dr. Ross (2011), the process of including animals in therapeutic interventions for children and youth was initially intuitive, rather than prescriptive:

One day I took a crying child to see the animals. It was pure instinct. It was where I went as a child myself during trying or lonely times . . . It worked like a charm then and every time thereafter. Petting the ponies or feeding the goat was enough to calm

children, stem the tears, and help them decide that Green Chimneys might not be such a bad place after all (p. 24).



Dr. Samuel "Rollo" Ross (left) and his wife, Myra (right), were the proud founders of Green Chimneys School and the Farm and Wildlife Center. Both were actively involved in the day-to-day work and mission of the organization until shortly before they passed away in 2018 and 2019, respectively.

As the AAI field began to take shape and gain formal recognition in the 1960s and '70s (Fine, 2015), Green Chimneys became known as an important pioneer in incorporating animal-assisted and nature-based programming in educational and therapeutic settings. In 1975, *The New York Times* released an article on Green Chimneys entitled, "Troubled Children Touch the World Through Animals." In this piece, the then Director of the Farm Program, John A. Gaines IV, described the "calming, soothing effect" of connecting with animals for youth whose "inner life is frantic and tumultuous" (Hammel, 1975, p. 54). Likewise, in an interview with the reporter, a young Green Chimneys student named Carmen Maggio remarked, "You wouldn't enjoy yourself so much here if they didn't have animals. And animals just give you less problems than people" (Hammel, 1975, p. 54).

Over the years, numerous similar publications have followed that support the continuous transformative work and leadership of Green Chimneys, particularly in regard to the school's innovative AAI and HAI programming for youth in need. In early 2019, nearly 45 years after the

release of the article described above, another *New York Times* reporter visited the farm and interviewed Austin Stark (among others), a student in his senior year from Midtown Manhattan. Austin remarked that he was slow to warm to the Green Chimneys environment, that he missed his life in the city. However, a noticeable shift in Austin’s outlook and behavior occurred when he began connecting with a bow-legged horse named Nelson. Austin’s history teacher, Sean Duffy, remarked on his progress in the article by saying, “I’ve seen Austin grow from a quiet, withdrawn kid in ninth grade to someone who is successful academically and socially. He has even become something of a leader in the class” (Schiffman, 2019, p. MB1).

For Austin himself, the bond he shares with Nelson appears to have a profoundly calming and grounding effect that is mutually supportive. According to Austin, “I felt for his pain; I gave



Nelson, a 24-year-old Thoroughbred gelding who arrived at Green Chimneys in 2014, continues to welcome staff, students, volunteers, and visitors to the Horse Barn and Equine Program.

Nelson moral support...if I was feeling bad, I would come to the Horse Barn to clear my head” (Schiffman, 2019, p. MB1). Today, Green Chimneys’ AAI program areas include: (a) the Equine Program, (b) the Wildlife Center, (c) the Teaching Barn, and (d) the Canine Program; each of these program areas are described in the front matter of this report on page 12, and will be discussed in more depth in Chapters 4-7.

3.2 Accreditations, Certifications, Licenses, and Memberships

As a school, residential facility and complex therapeutic farm, Green Chimneys holds several accreditations, certifications, licenses, and memberships relating to special education, as well as the care of animals and their inclusion in therapeutic work and academic instruction. A full list

of accreditations and certifying bodies is currently available online through Green Chimneys' website (Green Chimneys, 2019a). Many of these organizations are particularly relevant to the organization's overall AAI programming and, as such, are described in greater detail (and presented alphabetically) below.

Certified Horsemanship Association – While not a formal requirement, riding instructors at Green Chimneys are commonly certified through the Certified Horsemanship Association, an organization that aims to promote safety and education throughout the horse industry. Certification is obtained in a variety of horsemanship disciplines, such as Standard English and Western, Trail Riding, and Instructors for Riders with Disabilities (physical and cognitive; Certified Horsemanship Association, 2019). The initial certification process involves a five-day clinic and is evaluated by two Certified Horsemanship Association Certified Clinicians. Certified Horsemanship Association offers multiple, three-year certifications, from assistant to clinic instructor. Recertification requires proof of at least 25 hours of continuing education and work within the industry (Certified Horsemanship Association, 2019).

Equine-Assisted Growth and Learning Association – Several Green Chimneys staff members have received certification as Equine Specialists through the Equine-Assisted Growth and Learning Association (Eagala). The Eagala Model utilizes ground-based interactions with equines to facilitate the therapeutic process. This model mandates that two professionals be present during equine-assisted activities, with at least one being an Eagala-certified Equine Specialist and credentialed mental health professional who is responsible for ensuring the welfare and well-being of the



equine during the intervention (Eagala, 2019). In order for a mental health professional to become Eagala certified, he or she must complete the Fundamentals of the Eagala Model Training Course, which includes a pre-training online module, a five-day hands-on training, and submission of a professional portfolio (Eagala, 2019). Eagala certification must be renewed every two years, and requires the satisfactory completion of 20 hours of Eagala-approved continuing education (Eagala, 2019).

Farm-Based Education Network – Green Chimneys’

membership in the Farm-Based Education Network (formerly the Farm-Based Education Association) began a few years after the Network’s 2006 inception. This educational collaborative “works to strengthen and support the work of educators, farmers, and community leaders who provide access [to] and experiences of all kinds on working farms” (Farm-Based Education Network, 2019, para. 1). Green Chimneys’ continued membership strengthens the ability of staff to uphold the highest standards in applied HAI practice and research, as well as nature-based education (Green Chimneys, 2019a).



Federation of Horses in Education and Therapy International – Green Chimneys is an Associate Member of the Federation of Horses in Education and Therapy International. This non-profit organization promotes collaboration between members on a global scale to advance research, education, and philanthropy in the fields of equine-assisted activities and therapies.

Humane Education Coalition – As a partner of the Humane Education Coalition, Green Chimneys serves alongside over 115 organizations to collectively “advance the field of humane

education for the betterment of all living things” (Humane Education Coalition Strategic Plan, 2017). The Humane Education Coalition works collaboratively with its partners to provide grant funding, education, and resources for agencies that work to promote or teach about human rights, environmental ethics, and animal protection.

International Association of Human-Animal Interaction Organizations (IAHAIO) – Green Chimneys’ membership in IAHAIO reflects its strong commitment to the advancement and advocacy of HAI therapeutic interventions, education, and research. Green Chimneys administrators and staff take an active role in IAHAIO activities, including participation and presentation at international conferences and regular member meetings. In collaboration with the Institute for Human-Animal Connection at the University of Denver, Green Chimneys hosted the 15th Triennial IAHAIO Conference in Brewster, NY in April of 2019.

Professional Association of Therapeutic Horsemanship International (PATH Intl.) – Green Chimneys is a Premier Accredited Center of the Professional Association of Therapeutic Horsemanship International (PATH Intl.). Accreditation is achieved by meeting extensive industry guidelines established by PATH Intl. These guidelines relate to the equine facility and programming, as well as administration and staff credentials (PATH Intl., 2019b). As part of maintaining accreditation, Green Chimneys’ Equine Program staff are required to obtain and maintain individual Therapeutic Riding Instructor certification through PATH Intl. Instructor certification applies only to mounted activities, including therapeutic and adaptive riding lessons (PATH Intl., 2019a). Annually, instructors must complete 20 hours of continued education in Equine-Assisted Therapy and Equine Management and Welfare in order to renew their certification (PATH Intl., 2019a).

United States Department of Agriculture (USDA) – Green Chimneys holds a Class C license from the USDA, which is issued to exhibitors of non-equine mammals for public or educational use (USDA APHIS, 2017). Green Chimneys is classified as such given that animals onsite may take part in educational and therapeutic activities, insofar as their participation is appropriate. Notably, the Statement of Animal Care and Welfare at Green Chimneys (Kaufmann, 2017), written by the Farm and Wildlife Director, outlines the many ways in which the animals at Green Chimneys receive humane care and veterinary services.

Green Chimneys also receives permits through the USDA to ensure the proper care of wild and non-native mammal species. To renew these permits and licenses, Green Chimneys' wildlife rehabilitators must submit detailed reports on an annual basis that describe the individual animals they currently have in captivity, as well as the reason(s) for and dates of such captivity at Green Chimneys.

Moreover, the USDA conducts a random, annual inspection of all areas on campus that house Class C identified animals. This includes a careful review of animal records, documentation, and living conditions. To date, the Teaching Barn has closely followed the USDA's animal husbandry standards, and has been granted a renewed Class C license every year since 2006. In addition to federal compliance, Green Chimneys must also abide by New York State's Department of Agriculture and Markets regulations, which are public health- and animal disease-driven, species-specific, and include mandates on animal housing requirements (New York State Department of Agriculture and Markets, 2019). Abiding by these state regulations allows Green Chimneys to sell organic eggs collected from chickens living onsite at Boni-Bel Country Store.

United States Fish and Wildlife Services (USFWS) and New York State Department of Environmental Conservation

– These two organizations manage the distribution of licenses for the care and housing of captive wildlife, and are crucial to the operation of legal rehabilitation programs. Green



Chimneys employs a licensed Wildlife Caretaker, Wildlife Center Specialist, and Wildlife Program Teacher, each of whom are closely involved in the rehabilitation of injured, orphaned, or distressed wild animals in the care of Green Chimneys. Having these state and federal licenses authorizes Green Chimneys to house wild birds in captivity and to work with the birds in educational programming, therapeutic activities, and/or display for public viewing. Specifically, USFWS permits allow Green Chimneys to collect, rehabilitate, and permanently house (when release is not possible) endangered or threatened species, including eagles and other migratory birds (USFWS, 2019).

A special federal permit, regulated by USFWS, is required to care for migratory birds. Migratory birds kept under a “Special Purpose Possession – Education (Live) permit” must be non-releasable, and may be lawfully acquired from Rehabilitation, Falconry, Raptor Propagation, or other Federal Special Purpose Possession permittees (USFWS, 2017). Birds kept under this permit are required to be a part of wildlife conservation education, and must be included in at least 12 educational programs per calendar year (USFWS, 2017). Such educational programming may include birds who are periodically on display for Green Chimneys students and the public to view, and need not be taken out of their habitat enclosure or held on their



An Animal Caretaker speaks to a group of IAHAIO Conference attendees on how to determine whether a wild bird, like this blind barred owl, is “non-releasable.”

caretaker’s gloved hand to participate (USFWS, 2017). Birds considered “non-releasable” have injuries or other medical conditions that permanently prevent them from thriving in the wild, such as impaired flight, beak deformities, or visual impairments. Birds who have imprinted on a certain human or humans are also considered unsuitable for release or return to the wild. Of note, the state of New York licenses the care of non-migratory birds (e.g., pigeons and starlings) in captivity specifically through the Department of Environmental Conservation (New York State Department of Environmental Conservation, 2019).

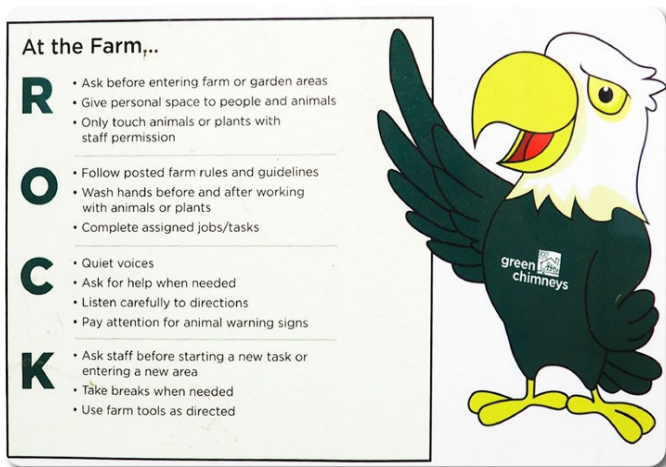
3.3 General Policies, Practices, and Procedures

The training of employees at Green Chimneys is considered an essential and ongoing component to the safe and effective delivery of services, both for humans (students, families, staff, interns, volunteers) and animals. As part of their initial on-boarding, all Green Chimneys staff members learn how to assist students and animals in the case of an emergency. These protocols are detailed in the *Green Chimneys Farm and Wildlife Emergency Preparedness Plan* (2013) for evacuations, lockdowns/lockout, and taking shelter during hazardous weather. In each scenario, the safety and welfare of animals are a top priority.

In addition, all Green Chimneys staff members who interact with students are trained in strategies to help manage student agitation and aggression, and to support students’ abilities to self-regulate through mindfulness, verbal de-escalation, and relaxation techniques. While the organization recently implemented a “no restraint” policy, staff are trained in the Therapeutic

Crisis Intervention model (Residential Child Care Project, 2016), which provides strategies on how to physically de-escalate students who are engaging in dangerous and life-threatening behaviors. Before and upon interacting with any animal, students are observed by staff for behaviors that might pose a risk to themselves, the animal, or staff/interns/volunteers. If a student is deemed unsafe, he or she is given an alternate activity or opportunity to take a moment to focus on regulating his or her emotions and behavior prior to interacting with the animals.

In some cases, the student may also be referred to an Animal Safety Committee to assess his or her potential risk to the animals, and to create a remediation plan to help re-integrate into nature-based activities (if appropriate). Remediation may include teaching the child better ways to regulate their emotions prior to interacting with animals (S. Klee, personal communication, May 23, 2019).



Visual cues are posted around campus to remind students of the expectations related to Respect, Ownership, Communication, and Keeping Safe.

Likewise, the *Animal-Interaction Assessment* (Luft & Becker, n.d.) is often used to assess whether a student is a good candidate for HAI activities. This assessment, created by a school psychologist and lead social work supervisor at Green Chimneys, is a clinician-administered instrument designed to provide information about a student's prior experience with, and current knowledge of, non-human animals (Luft & Becker, n.d.). Based on the student's behavior and sensory capacities, this comprehensive tool also assesses the level of potential risk if a specific student were to engage in HAIs. According to Luft and Becker (n.d., p. 1),

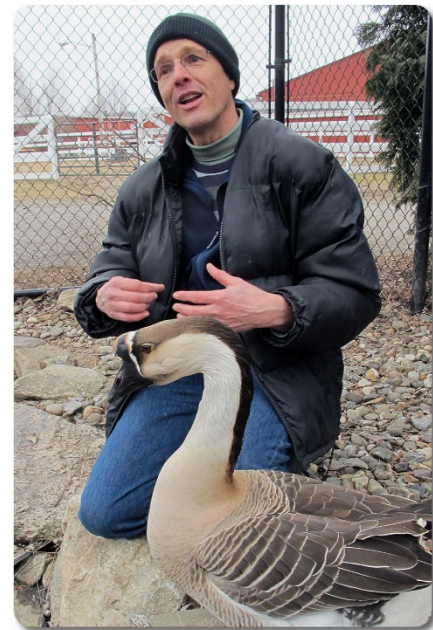
[W]hen a problematic interaction has occurred between a student and animal, it is recommended that a plan be created to ensure the safety of the animal and the child. In those instances, the information collected on the Animal-Interaction Assessment can be used to guide treatment decisions by offering the clinician insight into the function and history of problematic behaviors.

Students and animals are paired based on the information gathered from the *Animal-Interaction Assessment* and the goodness of fit between the student's characteristics (i.e., interests, behavior, personality, abilities) and those of the animal (i.e., perceived preferences, behaviors, temperament, size, health status). Paramount to the integrity of the therapeutic intervention and potential for progress is the safety and well-being of the animal, student, and Green Chimneys interventionist.

3.4 Staffing

Approximately 35 staff members oversee the direct management and operations of the Farm, Wildlife Center, and Garden from offices centrally located on campus (see *Green Chimneys Campus Map* on page 10). Additionally, more than 75 individuals volunteer at Green Chimneys each year, with approximately 40 working exclusively in nature-based program areas. The roles and responsibilities of key Farm and Wildlife personnel and interns are described in detail below.

Farm and Wildlife Director – The Director oversees all staff in the Farm and Wildlife Center Department, which includes the following program areas: the Equine Program, the Teaching Barn, the Wildlife Center, the Canine Program, the Educational Garden and Greenhouse, and the



A key component of the Farm and Wildlife Director's job is outreach and advocacy for Green Chimneys' nature-based programming. Lucy, the African Goose, is also a helpful ambassador.

Boni-Bel Farm and Country Store (see page 11). The Director also creates (and presents to the Green Chimneys Board of Directors) an annual farm report detailing the nature-based services provided, the Farm Center achievements over the past year (e.g., the quality improvements achieved and the progress made by resource efficiency), and the projections for growth and planning in the upcoming year. In addition, the Director serves as the main community spokesperson and liaison for the school and residential facility. This responsibility includes promoting the philosophy and mission of Green Chimneys; upholding existing HAI standards; and broadly promoting the applications and benefits of nature-based initiatives.

Farm Education Program Manager – The Farm Education Program Manager leads Green Chimneys’ nature-based internship program, including the selection, training, supervision, and evaluation of 24 interns each year. As a representative of the Farm and Teaching Barn on the Green Chimneys



School Education Team, this individual also collaborates with school staff to connect traditional classroom curricula with the academic and career technical education (CTE) activities offered through the Learn and Earn program. Individualized Learn and Earn and Mentorship objectives are identified for each participating student through staff discussions on his or her potential areas for growth related to classroom behavior and social skills (including the ability to form and maintain healthy boundaries with others). As a part of this process, the Farm Education Program Manager schedules all Learn and Earn and Mentoring farm activities for students, interns, and supporting volunteers.

Moreover, the Farm Education Program Manager assists the school administrative team and Farm and Wildlife Director in the development and broad integration of nature-based therapies and activities into other programs across the Green Chimneys campus. In addition to having practical experience working on farms and/or in educational settings that include a diverse range of farm animal species, the Farm Education Program Manager must have a solid understanding of humane education and its facilitation. This individual reports to (and, when needed, stands-in for) the Farm and Wildlife Director.

Farm Program Manager/4-H Program Coordinator – The Farm Program Manager/4-H Program Coordinator performs and oversees functions related to nature-based program development, as well as the supervision and management of Farm Maintenance staff (e.g., the Farm Animal Program Facilitator). Together with the Farm and Wildlife Director and Farm Education Program Manager, the Farm Program Manager/4-H Program Coordinator implements the unique philosophy of animal care throughout Green Chimneys’ therapeutic, non-production agricultural setting; represents the farm at administrative rounds in rotation; and contributes to the day-to-day scheduling of farm staff based on evolving program needs.

Other key responsibilities include: (a) providing supportive oversight regarding the daily management of barns, sheds, pastures, fields, and organic gardens; (b) collaborating with other Green Chimneys Farm Managers on the care of equines, farm animals, and wildlife; (c) broadly supporting the Green Chimneys administration, school, and social services departments; (d) serving as Green Chimneys’ primary liaison for veterinarians, sheep shearers, vendors, and other specialists; (e) maintaining Green Chimneys’ USDA C license through the careful management of animal medical records; (f) ensuring the accessibility of the farm for youth, families, staff, interns, volunteers, and the general public; (g) supervising staff in their delivery of public farm tours; and (h) assisting with farm special events and the activities of the Boni-Bel

Country Store. In addition, this individual works with classroom teachers and Teaching Barn staff to coordinate student participation in 4-H activities (e.g., the annual 4-H County Fair). This position reports to the Farm and Wildlife Director.

Farm, Wildlife, and Nature-Based Program Interns – Through the guidance of the Farm Education Program Manager, Green Chimneys interns are typically placed in one of the following six programmatic areas: (a) Farm Animal Education and Interaction; (b) Equine Education and Interaction; (c) Wildlife Rehabilitation, Education, and Interaction; (d) Shelter Dog Education and Interaction; (e) Garden Education; or (f) CTE at Boni-Bel Farm. Internships in all programmatic areas are offered during two main time periods: January through August and September through December. Due to the nature of the current growing season, the timeline for the CTE and Garden Education internships is somewhat flexible, with periodic tasks often occurring in April through November. While experience with animals is not a strict prerequisite, interns must be at least three years post-high school and complete a three-step screening process, including: submission of an online application, completion of a video application, and participation in an interview upon invitation.



After gaining familiarity and experience with the animal residents of the Teaching Barn, this intern knows how to keep them cool during the hot summer months. The alpaca likes a dip in the pool, while the llama prefers a gentle misting.

Selected interns receive five weeks of intensive training and orientation in Green Chimneys' Philosophy of Care, practical and child interaction skill development, species-specific and individual animal care, and Therapeutic Crisis Intervention. In addition to their participation in weekly peer supervision and Farm Team meetings, interns receive individual weekly supervision

from the Farm Education Program Manager and group supervision from the Program Manager in their designated programmatic area. Overall, Green Chimneys interns are responsible for facilitating approximately 20 Learn and Earn sessions per week, assisting with large group classes, and contributing to the operation of their programmatic area.

3.5 Facilities and Tangible Resources



The layout of the Green Chimneys school and residential facilities was designed with great care and consideration for integrating architecture with the natural environment. Providing youth with multisensory opportunities to experience nature, no matter their location on campus, was and continues to be a central goal. For example, each building makes strategic use of windows to expose children to natural light, as well as visual images of animals, trees, gardens, and meadows. Barns and other animal enclosures also provide visual, auditory, olfactory and tactile stimulation, which can be of great benefit to some students.

The design of animal housing is primarily centered around the species-specific needs of each inhabitant, including replication of natural habitats whenever possible. As such, pastures and paddocks intentionally incorporate hills to provide animals of all species with a typical free-

range setting conducive to their specific movement, exercise, and social needs. Likewise, housing for birds is located in a wooded area to provide them with shade and shelter, two central components of their natural habitats. The primary animal care and AAI facilities on campus include: (a) the Horse Barn and outdoor arena, (b) the Wildlife Center, (c) the Teaching Barn, and (d) June's Dog House, including indoor kennels and outdoor runs. Of note, certain animals also live in classrooms at the school, such as doves and small mammals.

3.6 Community Engagement Through Animal-Assisted Interventions at Green Chimneys

Green Chimneys provides regular opportunities for members of the community to visit the campus and interact with the animals, as well as learn more about the impacts of animal-assisted and nature-based programming for young people. A current and complete list of planned public events is available on the school's website: www.greenchimneys.org. Popular and time-honored Green Chimneys events are described in alphabetical order below.

4-H Putnam County Fair – For three days each summer, Green Chimneys students are invited to attend the Putnam County Fair's Annual 4-H Expo, where they present their animal handling skills and class projects in the areas of science, health, agriculture, and civic engagement (Cornell Cooperative Extension Putnam County, 2019). Here, Green Chimneys students compete against other Putnam County 4-H groups in Junior and Senior Showmanship competitions, which involve the handling and presentation of various animals including sheep, goats, llamas, cows, and pigs. Throughout the year, Green Chimneys students work hard to prepare for their participation at the fair, with opportunities to engage in such activities as sharing their projects through public speaking presentations, interacting socially with their peers and other Expo attendees, and gaining confidence in their animal- and/or species-specific knowledge and skills.

Birds of Prey Day – Every June for the past 27 years, Birds of Prey Day has celebrated Green Chimneys’ “dedication to children, the environment, and magnificent birds of prey” (Green Chimneys, 2019b, para. 5). Green Chimneys invites top wildlife experts and falconers to join its esteemed wildlife staff in conducting live animal presentations and free-flying demonstrations, with over 100 raptors onsite for the event. Additionally, the Wildlife Center is open for visitors to view over 50 birds of prey on display who currently reside at Green Chimneys, including an Andean condor and Griffon vulture, as well as numerous hawks, falcons, owls, and crows.



courtesy of Green Chimneys

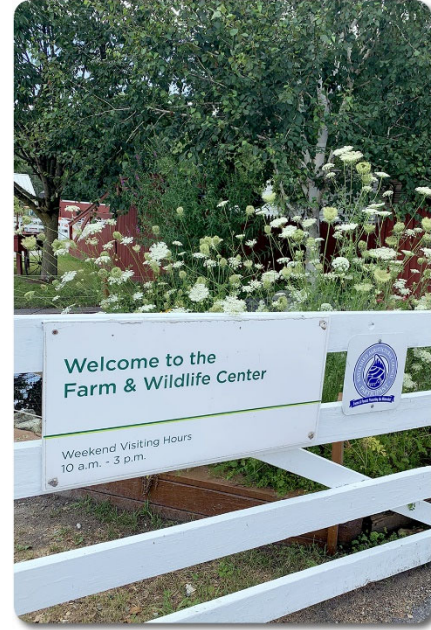


courtesy of Green Chimneys

Birds of Prey Day is Green Chimneys' largest public event of the year. In addition to flying and feeding demonstrations with birds of prey, exhibitions featuring animals from the Teaching and Horse Barns are also popular. For example, members of the community participate in pony rides and speak with 4-H students as they share their knowledge about specific farm animals.

Little Folk Farm Day – For over 30 years, Green Chimneys has hosted Little Folk Farm Day, an annual fall event designed to educate and engage young children (in preschool to third grade) and their families through participation in such positive nature-based experiences as hay rides, outdoor arts and crafts, and live entertainment in a natural setting (Green Chimneys, 2019a). This event also includes interactive tours of the campus, particularly at the Wildlife Center and Teaching Barn. For example, Wildlife Center staff offer children and their families educational programming and meet-and-greets with raptors and other animals.

Farm and Wildlife Tours – Green Chimneys is a popular destination for the surrounding community and visiting public because of its powerful mission, beautiful natural landscape, and variety of thriving and engaging animals who live onsite. As such, Green Chimneys staff offer regular campus tours that accommodate a range of group sizes. On Saturdays throughout the year, groups of up to five people are allowed to participate in free, self-guided walks around the grounds; larger groups must schedule their visits on Saturdays (from mid-April to mid-November) and pay a nominal or sliding scale fee for a guided tour. Of note, staff tend to limit the size and number of tour groups in order to prevent any undue stress to the resident animals (Green Chimneys, 2019a).



Local Partnerships – The Equine Program has strong and long-standing relationships with a number of local businesses, including horse stables, tack shops, and feed suppliers. For example, local tack shop Saddle Manor provides all tack and equipment outfitting for the Equine Program, and also has an in-store “wish list” program that allows customers to donate resources to Green Chimneys. Likewise, Green Chimneys purchases, leases, and accepts community donations of equines who are assessed and determined to be a good fit for the program’s needs. In addition to funding provided by the annual Farm Program budget, the Equine Program receives support through private donations and grants from the Newman’s Own Foundation, the Laura J. Niles Foundation, the EQUUS Foundation, and the Morgan Stanley Foundation (among many others).

Professional Development – Farm program staff coordinate a diverse array of professional development and educational opportunities for individuals studying or working in the AAI and HAI fields. Since 2015, Green Chimneys and the University of Denver’s Institute for Human-Animal Connection have co-hosted the annual Human-Animal Interaction Conference, with the location alternating each year between the Green Chimneys campus in New York and the University of Denver in Colorado. This conference draws international audiences interested in research and practice in animal-assisted, horticultural-based, and natural-environments interventions. Additionally, Green Chimneys hosts guest speakers and panel discussions focused on specific areas of AAI practice, such as the incorporation of therapy dogs into the treatment and education of youth on the autism spectrum.

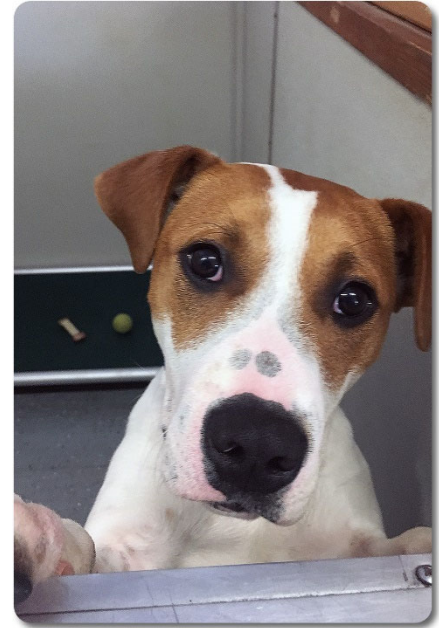
Volunteers, who are crucial to the operations of every Green Chimneys program area, receive a range of trainings and professional development opportunities. For example, in the Equine Program, an average of 10 community volunteers assist with daily and/or weekly activities, such as general barn chores and basic maintenance, therapeutic or adaptive riding lessons, horsemanship classes, vocational equine education, and Learn and Earns. Prior to working one-on-one with students or equines, volunteers complete an extensive and individualized training program on safety procedures (including Therapeutic Crisis Intervention); take a written theory exam; and have their horse handling and management skills assessed and approved by an Equine Program staff member. Rather than prescribing a set course of strict learning activities, volunteer training is largely customized according to each individual’s knowledge of, prior experience with, and overall comfort around equines. A handbook consisting of barn rules, attire guidelines, lesson procedures, and descriptions of volunteer roles in the context of student lessons is also made available to each Equine Program volunteer-in-training.

Volunteering in the Equine Program also provides individuals who may not otherwise have access to equines with an opportunity to interact with horses on a regular basis. Likewise, volunteers with less experience are given a chance to increase their equine knowledge, skills, comfort level, and advocacy. Regardless of the initial reasons for seeking a volunteer position in the Equine Program, most individuals report that developing relationships with students is ultimately the most rewarding aspect of their volunteer experience (A. O'Brien, personal communication, March 22, 2017). Seasonal and annual recognition events are held in honor of volunteers' service and dedication. Because of their genuine interest in working with horses and the unique youth population and setting at Green Chimneys, the majority of volunteers tend to remain active and committed to the Equine Program program for at least six months, if not longer (e.g., some volunteers have been working with Green Chimneys for over 15 years). For more information on the Equine Program, see Chapter 4.



Sale of Goods – In the 1950s, Green Chimneys sold wool and milk from its resident sheep and dairy cows, respectively. However, both endeavors were ultimately deemed too costly to continue, particularly from a time management perspective. Today, on a very small scale, Green Chimneys sells free range eggs collected from the chickens who reside at Boni-Bel Farm. These eggs are available for purchase at the Boni-Bel Country Store, in accordance with New York State Department of Agriculture and Markets (2019) regulations.

Socialization of Dogs for Adoption – A hallmark of Green Chimneys’ Canine Program is the socialization of shelter or stray dogs for adoption, and the powerful impact these activities have for the students, community, shelters, and the animals themselves. Since 2014, 134 dogs have been adopted from the program with a very low return rate. Shelter dogs at Green Chimneys are taught basic obedience skills and are socialized with children and youth in a variety of settings (i.e., classrooms and residential dorms), making the dogs even more desirable candidates for adoption. Importantly, students play an active role in caring for, training, and socializing shelter dogs and supporting their successful future adoptions. For more information on the Canine Program, see Chapter 7.



Summer Camp – During the summer, Green Chimneys offers camp programming to local children, aged 4 to 15 years, who are not enrolled in the school. Three sessions of Hillside Camp, lasting three weeks each, are held onsite alongside regular educational programming for enrolled Green Chimneys students (Green Chimneys, 2019a). The Farm Program Manager/4-H Program Coordinator provides training and guidance to summer camp counselors to support their facilitation of two interactive clubs as part of the summer camp programming: the Llama Club and the Sheep Club (X. Dyson, personal communication, March 22, 2017). Students involved in these summer camp clubs learn basic animal anatomy and caretaking; how to interact safely with the animals; and an overview of animal reproductive processes, breed origins, and basic showmanship skills.

3.7 Considerations for the Humane Care of Animals

Green Chimneys upholds high standards of care, welfare, and ethical practice regarding the animals who reside onsite. Special attention and dedication is paid to each animal's species-specific and individual needs, including those that concern his or her health and well-being, diet, activity, housing, socialization, affection, temperament, preferences and aversions, retirement, and end-of-life care. The organization's *Statement of Animal Care and Welfare at Green Chimneys*, written by the Farm and Wildlife Director, details the school's commitment to protecting the rights of animals in their charge:

Best practices in [HAI] programming require that the best way to prevent stress in therapy animals is to not ask too much of each animal in the first place. Prevention of stress is the key. Frequent breaks, rest periods, interaction time with other animals and frequent evaluation of each individual helps the staff to ensure that animals of diverse species flourish in the program (Kaufmann, M., 2017, p. 1).

The Five Freedoms

The steps that Green Chimneys has taken to prevent animal stress and/or harm is made evident by the organization's commitment to adhere to the *Five Freedoms* (Command Paper 2836, 1965). Formal animal welfare standards were first developed in 1965 via the United Kingdom's *Brambell Report*, and described the need to provide animals (specifically farm animals and livestock) with opportunities "to stand up, lie down, turn around, groom themselves and stretch their limbs" (Command Paper 2836, 1965, p. 13). Not long after, the Farm Animal Welfare Council updated these standards to the *Five Freedoms* (listed below and tailored for each species and/or program area in the chapters that follow), which are currently practiced by animal caretakers around the world, including across the Green Chimneys campus. Notably, animal welfare scholars (i.e., Mellor, 2016 and others) have recently proposed expanding these standards to the *Five Provisions*, a framework that takes a proactive approach in focusing the *Five Freedoms* not only on minimizing negative experiences for animals, but also on promoting

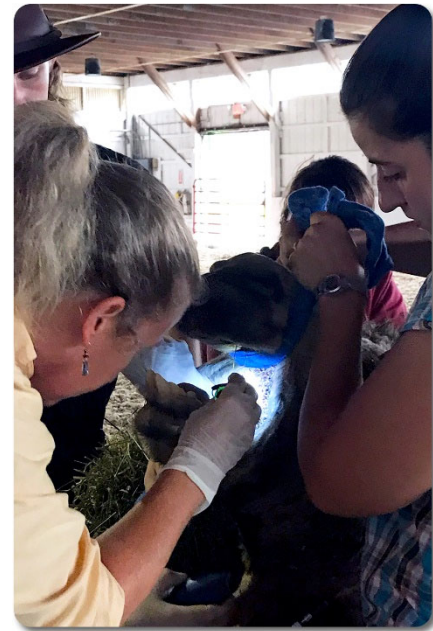
positive ones. The *Five Freedoms* are listed below in Table 3.7.1 (Farm Animal Welfare Council, 2012, para. 2):

Table 3.7.1. The Five Freedoms

Freedom	Description
From hunger and thirst	"By ready access to fresh water and a diet to maintain full health and vigour"
From discomfort	"By providing an appropriate environment, including shelter and a comfortable resting area"
From pain, injury, or disease	"By prevention or rapid diagnosis and treatment"
To express normal behavior	"By providing sufficient space, proper facilities, and company of the animal's own kind"
From fear and distress	"By ensuring conditions and treatment which avoid mental suffering"

Veterinary Care

The *Statement of Animal Care and Welfare at Green Chimneys* outlines the measures taken to support animal husbandry, veterinary care, enrichment, and animal health record keeping as reflected in the guidelines issued by the USDA's *Animal Welfare Act and Animal Welfare Regulations* (2017). Due to the diversity of species living in the farm and wildlife areas, Green Chimneys works closely with two veterinarians with specialities in exotic avian, farm animal, and equine medicine. Green Chimneys also keeps detailed medical logs and records of veterinary treatment, prescribed medication, vaccinations, supplemental nutrition, and oral medication for the prevention of



Even camels need dental care. Here, Sage sits calmly while Equine Program staff assist the veterinary dentist with this routine check-up.

zoonotic diseases. These logs are updated regularly and are kept within reach of each respective department. Animals are also taken to veterinary specialists as needed, such as Tufts University Veterinary Hospital and the New England Equine Surgical and Medical Center. The veterinary practices offered at Green Chimneys are discussed in greater detail in later chapters that thoroughly describe each program area.

3.8 Summary

Youth engagement in therapy and learning is often enhanced by the thoughtful inclusion of animals, animal interaction, and animal environments in clinical and educational interventions. At Green Chimneys, such AAI and nature-based programming is led by a specialized and highly trained transdisciplinary team [e.g., clinical social workers, mental health and occupational therapists (OTs), teachers and educators, farm and wildlife specialists, and dedicated interns and volunteers] in the classroom, student residences, Horse and Teaching Barns, Wildlife Center, canine kennel facilities, and other natural settings across campus. Through various applications and approaches, AAI at Green Chimneys is designed to build positive and mutually beneficial relationships between students, animals, communities, and the surrounding environment.

In addition, AAI programs provide diverse options for clinicians to supplement and enrich more traditional therapeutic modalities for their young clients (S. Klee, personal communication, May 23, 2019). When students work closely with an animal, taking on the responsibility of caring for themselves and the animal's well-being, they are demonstrating growth in all aspects of PYD. Likewise, AAI encourages youth to use their individual strengths and assets to cultivate and deepen their bond with an animal, and to engage positively with the practitioner and intervention. Green Chimneys' social workers and other clinical staff are not required to use animal-assisted or nature-based approaches in their work with students;

however, doing so is highly encouraged given the mission and philosophy of the school, as well as the documented benefits of these practices.



Although steadily growing in popularity, the presence of AAIs in youth programs is not yet common, nor is the use of clearly defined AAI protocols or the inclusion of AAI practices in academic curricula for clinical or teaching professionals-in training. This will likely evolve as the research investigating the efficacy of these complementary interventions continues to expand. The innovative and highly accredited programs at Green Chimneys have set the standard and exemplify just how far the AAI field has advanced. Indeed, Green Chimneys' animal-assisted programming is conceived of and conducted ethically (with a strong consideration for the safety and welfare of human and non-human participants), and in a manner that maximizes the potential for positive student outcomes. Figure 3.8.1 (opposite page) provides a brief overview of the animal-assisted therapies, activities, and educational programs offered at Green Chimneys, which will be discussed in depth and with greater specificity in each of the following four chapters in Part II.

Figure 3.8.1. Green Chimneys' Animal-Assisted Interventions

Green Chimneys Animal-Assisted Interventions				
	Horse Barn	Wildlife Center	Teaching Barn	Canine Program
Animal-Assisted Therapy [AAT]	Equine-Assisted Individual Psychotherapy Camel-Assisted Individual Therapy	Animal-Assisted Occupational Therapy Animal-Assisted Physical Therapy	Animal-Assisted Individual Therapy	Canine-Assisted Group Psychotherapy Canine-Assisted Individual Psychotherapy Canine-Assisted Individual Occupational Therapy
Animal-Assisted Activity [AAA]	Therapeutic Riding (HS) Elective Riding Club Horsemanship Club	Visit Lucy at Duck Pond Bird Releases Wildlife Rehabilitation	Open Pen (Visit farm animals in barn) Evening Visits	Morning Bus Greeting Dog Dorm Visit After School Activities Crisis Management Canine Education Class
Animal-Assisted Education [AAE]	Learn and Earns Career Technical Education Equine Class	Learn and Earns Wildlife Class	Learn and Earns Farm Science Class 4-H Club	Learn and Earns Canine Career Technical Education Class

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Chapter 4: Equine Program



At Green Chimneys' Horse Barn, outdoor arena and riding ring, students participate in a variety of therapeutic and educational interventions enhanced by the inclusion of equines and camels. In the Equine Program, children and youth may engage in mindfulness exercises on horses through adaptive riding; groom and provide nurturance to donkeys on the ground; provide daily food and water for ponies and miniature horses; and learn about a camel's behavior (and how to regulate their own) by leading him or her across an outdoor pasture. Through these animal-assisted interventions (AAIs), students often develop meaningful connections with equines and staff, as well as gain skills essential to social-emotional learning (SEL) and positive youth development (PYD). Notably, given the large size of camels and most equines, youth participants in this program area are given the opportunity to safely overcome fears, gain confidence, and share their newfound knowledge with others through human-animal interaction (HAI). Likewise, as most equines are sensitive to subtleties in human behavior and environmental stimuli, the Horse Barn provides students with a rich venue in which to develop self-awareness, emotional regulation, empathy, and character.

4.1 Summary of Selected Research

Historical Background on Equine-Assisted Interventions and Research

Medical literature supporting the potential benefits of horseback riding for people's health can be found as early as the second century CE (Ekholm Fry, 2013). For thousands of years, humans have relied on horses as an important means of transportation, as well as a valuable asset in battle, agriculture, communication, commerce, and trade. Today, horses are more widely recognized for the therapeutic benefits they offer humans, including helping individuals cope with the physical and emotional challenges of traumatic brain injury, post-traumatic stress disorder (PTSD), anxiety, depression and autism spectrum disorder (ASD), among others (Buck, Bean, & De Marco, 2017). Beginning in the 1970s, therapeutic riding (also known as adaptive riding) for people with special needs became formalized through the North American Riding for the Handicapped Association. These efforts sparked increased interest in studying the mechanisms and efficacy of therapeutic riding, including hippotherapy (which utilizes the horse's movements to assist with the treatment of physical, occupational, and speech and language challenges), for the purposes of human well-being. Over the past several decades, research on the therapeutic benefits and applications of horses has broadened to include both mounted interventions (i.e., therapeutic riding, hippotherapy) and therapeutic activities on the ground.

Arguably, horses and other equines (e.g., donkeys, mules, and miniature horses) may be particularly well-suited to assist in therapy due to being prey animals and, consequently, having a heightened awareness of their surroundings and sensitivity to the state of others (Buck et al., 2017). Horses are naturally social, thrive in group settings, and are inclined to protect and connect with one another in times of stress (Buck et al., 2017). Horses are also similar to humans in that they have distinct personalities, apparent moods, and significant relationships with other horses. Taken together, these attributes allow horses to form meaningful connections with

humans. This connection can be of tremendous value, both in therapy and in other contexts, for humans in times of stress, anger, sadness, and fear (Buck et al., 2017).



Several systematic reviews (Bronson, Brewerton, Ong, Palanca, & Sullivan, 2010; Jormfeldt & Carlsson, 2018; Selby, 2009; Snider, Korner-Bitensky, Kammann, Warner, & Saleh, 2007; Sterba, 2007; Zadnikar & Kastrin, 2011) have largely concluded that, while equine-assisted interventions show

promise as therapeutic endeavors, more evidence is needed to determine clinical effectiveness.

Several factors in particular threaten the validity of studies in this area, primarily in terms of research design and methodology (Kazdin, 2010; MacKinnon, Noh, Laliberte, Lariviere, & Allan, 1995). These issues include small sample sizes, limited inclusion of a control or comparison group, and a lack of validated instruments to measure outcomes related to HAIs. Moreover, one challenge to synthesizing available research data in equine-assisted interventions is the often inconsistent use of terminology. As noted by Ekholm Fry (2013), "...sub-terms are not clearly defined; practitioners may choose a term based on personal preference and the equine-assisted mental health training they have received" (p. 257). Terms such as *therapy*, *psychotherapy*, *mental health*, *learning*, *interventions*, and *activities* are often used interchangeably when referring to equine-assisted work with clients, yet the goals and measures of the different practices often vary considerably, making the consolidation of research findings difficult.

Notably, qualitative and anecdotal data relating to equine-assisted interventions have been useful in documenting individual experiences, but the "use of randomized control trials, regarded as the gold standard of evidence-based practice, in addition to sound methodological design and large sample sizes, is encouraged to establish an evidence base for [all] animal-assisted therapies"

(Ekholm Fry, 2013, p. 265) – equine and otherwise. Additionally, while research measuring the impact of AAIs on equine stress and quality of life is growing, with some studies indicating that horses experience minimal to no physiological and/or behavioral stress as a result of their AAI participation (Gehrke, Baldwin, & Schiltz, 2011; Malinowski et al., 2018; McKinney, Mueller, & Frank, 2015), additional scientific inquiry in this area is strongly needed given the field’s increasing popularity. Nonetheless, equine-assisted intervention research has indicated promising, albeit limited, findings regarding youth with emotional, behavioral, and learning challenges.



Green Chimneys' two camels – Phoenix (left, with his summer haircut) and Sage (right) – greet and engage with visitors.

The Inclusion of Equines in Therapeutic and Educational Contexts

Several studies present findings that have important implications for the inclusion of equines in interventions seeking to promote PYD. For example, Kaiser, Smith, Heleski, and Spence (2006) found that youth, aged 8-13 years, who were identified as “at-risk” and/or in need of special educational services, experienced a decrease in anger after participating in either weekly or biweekly therapeutic riding sessions. The participants’ anger scores were assessed before and after these 60-minute sessions using the Children’s Inventory of Anger. While this study’s sample was small ($n = 20$), the results demonstrate potential social-emotional and self-regulation benefits of therapeutic riding for children with a broad range of learning, behavioral, and/or psychosocial challenges.



Mounted activities allow students to interact with horses and staff members, providing them with opportunities to improve emotional and behavioral awareness, communication, and social skills.

Increasingly, research suggests that equine-assisted therapy for youth may enhance their social and behavioral interactions and strengthen their self-concept (Masini, 2010). In a 2010 case study, young survivors of sexual trauma reported that equine-assisted psychotherapy enhanced their feelings of safety and trust in others, increased their self-awareness, allowed them to connect with their feelings at a deeper level, provided a supportive

environment to share their story, and helped them feel empowered and confident enough to take healthy risks and test new behaviors (Masini, 2010). It is important to note that, while the above self-reported findings are encouraging, other, more rigorous research in the area of equine-assisted psychotherapy for youth with trauma histories did not find interventions with equines to be significantly more effective in reducing post-traumatic stress symptoms than traditional therapy in an office setting (Mueller & McCullough, 2017). In other words, Mueller and McCullough (2017) found that youth, aged 10-18 years, in their treatment condition (i.e., a 10-week equine-assisted psychotherapy intervention) and control group (traditional therapy) both experienced significant decreases in post-traumatic stress symptomology in relatively equal measure.

Recently, a 2018 systematic review by Jormfeldt and Carlsson described several studies from 2003-2015 that measured the effects of equine-assisted interventions for children and adolescents (all 16 years of age and younger) on the autism spectrum. The reviewed studies included various types of equine-assisted interventions, including therapeutic riding, hippotherapy and grooming, as well as programs centering on psychoeducational horseback riding, community-based therapeutic recreation, equine-assisted learning, and riding for people with disabilities (Jormfeldt

& Carlsson, 2018). Across studies, findings generally showed improvements in youth behavior, communication, social skills, motor control, and self-care in association with equine interaction.

Mechanisms of Change in Equine-Assisted Interventions

Various mechanisms of change are thought to underlie equine-assisted interventions. Broadly, these align with those of many other AAIs and nature-based interventions (NBIs; Ekholm Fry, 2013, 2019), and include the following:

Biophilia – This hypothesis posits that people have an innate connection to, and tendency to focus on, other living beings and the natural environment (Wilson, 1984).

Biophilia has been used to support the notion that the relational presence of a calm and healthy horse can assist with feelings of safety, as well as physical and emotional regulation, in humans.



A walk to see the calm and welcoming miniature horses in the open paddock often helps students manage their emotions when feeling dysregulated.

Relationship – The human-horse relationship is central to equine-assisted mental health interventions. Formation of a trustworthy and mutually influential relationship with a non-human animal is believed to provide an experience of well-being, and aids further exploration of the role of relationships in clients' lives. The presence of an equine in therapeutic and educational settings can also help foster a reliable and purposeful alliance between client and therapist or student and teacher (Bachi, Terkel, & Teichman, 2012; Schlote & Parent, 2018).

Client motivation – During challenging activities, such as working through emotional and physical pain or trauma, horses may help to further engage clients and increase their motivation to continue in therapy (Bachi et al., 2012; Kendall et al., 2015).

Therapeutic environment – When working with horses, therapeutic activities generally take place in a barn, ranch, or pasture setting. In comparison to a typical therapist’s office or teacher’s classroom, these relatively novel, outdoor environments may be experienced as more open, inviting and welcoming to a client, thereby encouraging greater connection and willingness to participate in therapy or learning (Bachi et al., 2012; Yorke, Adams, & Coady, 2008).

Movement – When working with large animals such as horses, movement is an inherent part of most activities. Rhythmic movement for some clients not only provides general physical health benefits, but is also correlated with improvements in mental and emotional states (i.e., experiencing greater focus/attention, feeling calm and connected; Hasler 2017).

Touch – While bodily touch is widely accepted as an important aspect of the human experience, therapeutic practitioners have an ethical obligation to avoid most physical contact with clients in practice. Meanwhile, horses provide a unique opportunity for clients to experience physical contact with several areas of a large animal’s body, potentially supporting relevant aspects of human health and development (i.e., reducing arousal, feeling comfortable and present, and increasing body awareness through touch; Bachi et al., 2012; Mueller & McCullough, 2017).

4.2 Overview of the Equine Program

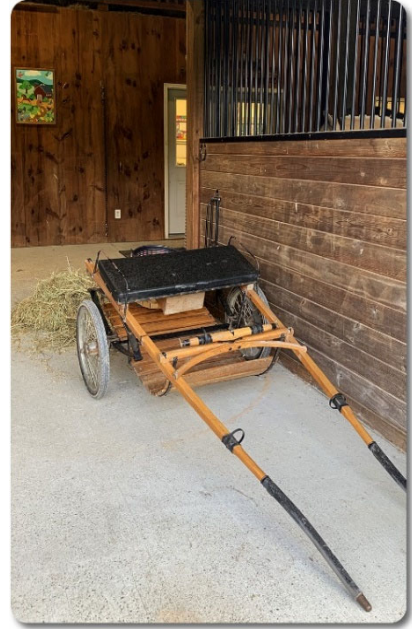
Horses, miniature horses, donkeys, ponies, pony-mules, and Bactrian camels play an integral role in the AAIs offered at Green Chimneys. Although camels are not equines, they live at the Horse Barn and are considered part of equine programming at Green Chimneys. The overall mission of



the Equine Program is to explore and enjoy human-equine interactions in a positive and caring way, while also providing inclusive and supportive services for children and youth. Equine and camel experiences for Green Chimneys students range from classes on riding skills to groundwork activities to basic animal care, such as feeding, watering, and mucking stalls. Interacting with a horse on the ground (e.g., through leading, grooming, and circle work) may be best for students who are unable to participate in mounted activities due to physical conditions or medication that could compromise balance and coordination during riding activities. In such cases, Green Chimneys staff are committed to preventing any stigma or shame among students, especially when in the presence of their peers. For example, students who are not able to ride horses are typically present in the Horse Barn on days when only unmounted activities take place. Likewise, if the student is older, staff may use his or her age and/or higher level of responsibility as rationale for his or her participation in groundwork tasks. Overall, offering opportunities to engage in both mounted and unmounted activities, while being sensitive to each child's unique circumstance, corresponds with Green Chimneys' greater mission of providing an environment that is educational, therapeutic, nurturing, and adaptive to the needs of all students.

Horses have long been part of the Green Chimneys community, beginning with Dr. Ross' affinity for horseback riding and carriage driving. Prior to the development of Green Chimneys' modern classroom buildings, fenced-in pastures extended throughout much of the area where the school currently stands (see *Green Chimneys Campus Map* on page 10). From 1997 to 2007, Dr. Susan Brooks served as Green Chimneys' farm psychologist, and was instrumental in shaping and formalizing AAIs at the school, particularly equine-assisted psychotherapy (M. Kinoshita, personal communication, March 22, 2017). Dr. Brooks was a board member of the Equine

Facilitated Mental Health Association, an organization that stemmed from, and eventually rejoined, the North American Handicapped Riding Association. The latter Association is now known as the Professional Association of Therapeutic Horsemanship International (PATH Intl.), the world's largest professional organization that specializes in therapeutic horsemanship and equine-assisted activities. Overall, PATH Intl. seeks to promote a variety of equine experiences to inspire and enrich the lives of those who participate, a mission closely aligned with that of Green Chimneys. Since first becoming an accredited PATH Intl. facility in 2003, Green Chimneys' Equine Riding Program has earned and maintained accreditation every year, and is listed as a Premier Accredited Center demonstrating 100% compliance with mandatory PATH Intl. standards.



This harness racing sulky is currently only used for display and demonstration, but its presence in the Horse Barn pays tribute to the long history of equine-related activities at Green Chimneys.

4.3 General Policies, Practices, and Procedures

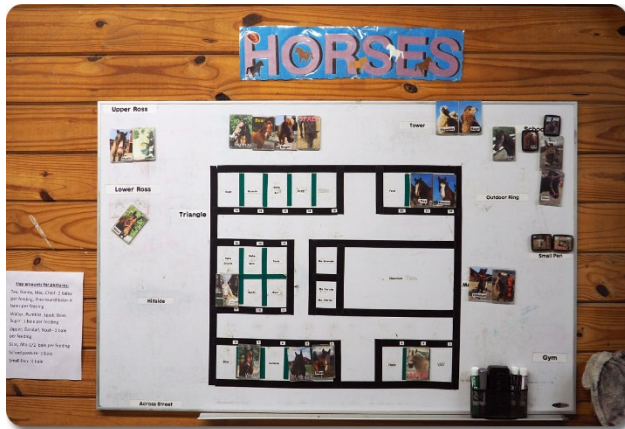
The safety of humans and animals is paramount at Green Chimneys and is reflected in the Equine Program's policies and procedures. Every student is encouraged to take at least one quarter of therapeutic riding lessons, if not contraindicated by any physical or medical conditions (e.g., unmanaged seizure disorders or allergies). If conditions prevent the student from horseback riding, ground-based activities are offered so that everyone has the opportunity to interact with equines (see above). Students are also allowed to elect out of the Equine Program if they so choose.

Participating students are always accompanied into the Horse Barn by a Green Chimneys staff member, who is typically a member of support staff or of the Equine Program team. Students are expected to adhere to the general barn rules, which are explained to them when they first begin working with equines and reiterated in subsequent interactions. These include using quiet voices and calm movements around equines; asking for staff permission before interacting with an equine; never reaching through stall bars (e.g., to touch an equine); and always being kind and respectful toward equines. When a student does not follow a rule, the facilitator gives a reminder and, if needed, further clarification of the expectations. If the student is still unable to follow the rules, he or she is given a verbal warning and may be asked to leave, or be removed from, the Horse Barn.



Safety procedures for mounted activities adhere to those set forth by PATH Intl. (2019). These include requiring all students to wear approved, certified helmets when riding, and to use emergency-release stirrups on English saddles and tapadero-style stirrups on Western saddles to prevent feet from slipping

and becoming stuck. Equipment safety checks are performed prior to a student mounting a horse, and again when the student is mounted. These checks focus primarily on confirming a proper fit and position of the horse's equipment, including adequately tightening the saddle girth or cinch and ensuring that the rider's apparel (i.e., safety helmet and close-toed shoes) are positioned properly (PATH Intl., 2019). Additionally, all mounted activities are supervised by a PATH Intl.-certified Therapeutic Riding Instructor who is familiar with, and committed to, high safety standards.



In the event of an emergency, this equine tracking board — which is regularly updated as horses, donkeys, ponies, and camels are rotated to different paddocks across campus — helps ensure that no equine is left behind.

Staff at Green Chimneys maintain an ethical responsibility for the care of both students and animals. Thus, multiple staff and volunteers assist during all equine activities, with extensive policies in place to ensure the safety of each participant. If a student and horse need to be separated (e.g., due to unsafe student behavior), volunteers can remove the horse from the situation, while instructors or other staff with training in behavioral de-

escalation assist the student. A walkie-talkie radio is also held by at least one Green Chimneys staff member during daily equine activities so that he or she is able to communicate with other staff on campus in case of emergency. Likewise, a landline phone is available in the riding arena and a cell phone is carried by the instructor when programs are held outside.

Moreover, all equine medication and feed bins are locked, as are private areas such as offices, classrooms, and the hayloft when not occupied by a staff member. At the beginning and end of their shift, volunteers sign keys in and out, with permanent keys only given to full-time staff and interns. Pasture gates are also locked to ensure that equines remain safely inside fenced areas. At the end of each day, loose equipment (i.e., cross-ties, lead ropes, shovels, and pitchforks) are removed from open areas and secured behind locked doors. Additionally, security staff survey the Horse Barn during their nightly rounds and six security cameras monitor the farm program areas 24/7.

4.4 Staffing

With the support of up to 25 volunteers, the Equine Program is primarily managed by three full-time staff and three to four interns. Likewise, staff from other departments, such as Social Work and School Psychology, also utilize equine programming on a regular basis.

Equine Program Coordinator – The Equine Program Coordinator is chiefly responsible for the management and operations of all equine activities, and reports directly to the Farm and Wildlife Director (see Chapter 3). This person oversees all activities involving equines, is an instructor for equine programming, and coordinates initiatives with school staff. In collaboration with the Barn Manager and other support staff, the Equine Program Coordinator is responsible for selecting and training horses, developing and managing the departmental budget, and seeking additional funding opportunities through grant writing.

Equine Program Facilitator – The Equine Program Facilitator reports to the Equine Program Coordinator and is responsible for supporting Equine Program management, operations, and class instruction. A critical and unique component of this role is volunteer management, including the recruitment, scheduling, training, and continuing education of Equine Program volunteers. The Equine Program Facilitator is also responsible for after-school equine activities for students, including Riding Club and Horsemanship.

Barn Manager – The Barn Manager is a full-time position and, like the Equine Program Coordinator, reports to the Farm and Wildlife Director. This person is responsible for ensuring the general care and health of equines; overseeing daily operations in the barn; developing curriculum; and leading equine instruction for the school's career technical education (CTE) program. For mounted and unmounted lessons, this individual works closely with instructors to determine the most appropriate equine(s) for students to work with based on individual human

and animal characteristics, such as balance, muscle strength, frustration tolerance, and personality. The Barn Manager also serves as a substitute instructor for mounted lessons when needed. Interns in the Horse Barn report to the Barn Manager for daily assignments, equine management education, and assessment of long-term career goals and learning opportunities.



Career Technical Equine Education Instructors – These instructors are responsible for providing older students with vocational, social, and behavioral training to teach such skills as grounds maintenance, horse health care, and grooming. Because New York State Department of Education (NYSED) standards for CTE programs require a minimum number of hours dedicated to hands-on experience, participating students often hold part-time jobs at grocery or country stores to supplement their experience in the Equine Program. Students are evaluated by their instructors on certain employability characteristics, such as attendance, punctuality, ability to work with others, appropriate dress, and other basic job skills that they will need in typical job settings.

Equine Program Interns – Equine Program internships are offered for four or eight month periods. Between two and four qualified interns are accepted each internship cycle. While equine experience is not required, it is preferred. The intentions of this program are to prepare interns to manage an equine facility and/or to give them experience working with children with special education needs in a therapeutic setting.

Interns complete extensive training during their first three months of work at Green Chimneys, and are assessed through a riding evaluation administered by the Equine Program Coordinator. Overall, interns support daily operations in the Equine Program by cleaning, mucking, feeding, and performing other important animal care tasks (i.e., exercising the horses); specific tasks are assigned based on the results of their riding evaluation assessment. Likewise, Equine Program interns often work one-on-one with students during Learn and Earns (see Sections 2.7 and 4.8 for more information).



Equine Program Volunteers – Volunteers are critical to the daily operations of Green Chimneys' Equine Program. Prospective volunteers apply through Green Chimneys' general volunteer application process (see Chapter 1) and, after an initial screening, are contacted by the Volunteer Coordinator for further review (Green Chimneys, 2019). Volunteers in the Equine Program must be at least 18 years old and work an average of 5-10 hours per week. While horse experience is preferred, it is not mandatory. Volunteer orientation and training includes a tour of the farm, barn, and outdoor arena; an in-depth review of volunteer responsibilities and safety procedures;



lessons in grooming and leading the horses; and an instructional video from PATH Intl. Volunteers are asked to make a six month commitment to the Equine Program, although many continue working with the program for much longer.

4.5 Facilities and Tangible Resources

The Horse Barn is located along the north side of the Green Chimneys campus between Ross Field and the Farm and Wildlife Center (see *Green Chimneys Campus Map* on page 10). The indoor facilities contain a total of 22 12 square foot box stalls that are arranged in two rows of 11. This provides enough stalls to house all equines indoors when needed, such as during inclement weather. Horses are also moved into stalls prior to and after activities with students so they can be more easily groomed and outfitted with appropriate equipment (e.g., saddle, bridle). Stalls open onto cement aisles that are 12 feet wide and offer additional areas for cross-tying horses for stationary unmounted activities. Giving students multiple options where they can work with equines and camels during different activities allows for consideration of the needs of the student and the animal (e.g., comfort level in enclosed or open spaces).



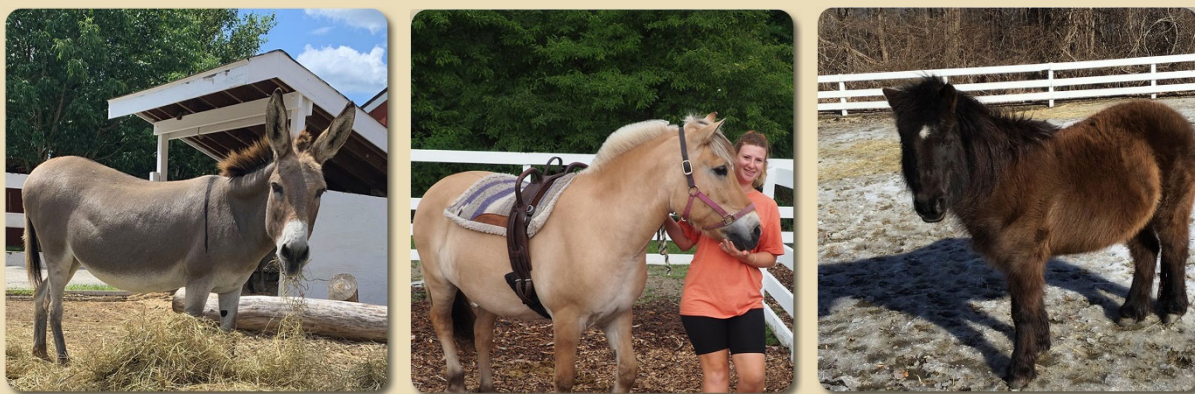
Although they spend most of their time outside, all animal residents of the Horse Barn have comfortable interior quarters. The spacious stalls are intended for individual occupancy, provided with fresh hay and water, and cleaned on a daily basis.

A work room and tack room are adjacent to each other in the center of the Horse Barn building, along with several staff offices. At the south end of the facility, the main aisles lead to an indoor riding arena, with a second, outdoor arena located next to the barn. Both arenas are enclosed by wood panel fencing. Trails and walkways throughout campus are also used for outdoor equine activities. Additionally, a series of fenced-in pastures are situated east of

the Horse Barn, each with a shelter that provides animals protection from natural elements such as sun, wind, and precipitation. Equines spend most of their time in these pastures in small groups so they can benefit from freedom of movement and social interaction. Likewise, miniature horses and donkeys live primarily in a small, outdoor turnout located between the Teaching Barn and classroom buildings.

4.6 Animals in the Equine Program

Currently, several types of equines, and two Bactrian camels, reside at Green Chimneys' Horse Barn. Having a variety of species and breeds allows students to be matched with animals whose characteristics (i.e., size and temperament) are well-suited to their individual treatment goals and abilities. On average, there are 20 animals who fall under the care of Equine Program staff, such as horses (sometimes including Clydesdales), miniature horses, miniature donkeys, camels, Shetland ponies, and a pony-mule (a horse-donkey hybrid). Although not equines, two camels also live in the Horse Barn because Equine Program staff have expertise in working safely and effectively with large animals, and have received species-specific training from camel experts.



Green Chimneys' Horse Barn houses multiple equine species, including (left to right) donkeys, Norwegian fjord horses, and one Shetland pony.

4.7 Considerations for the Humane Care of Animals

Across the Green Chimneys campus, staff and volunteers attend to the species-specific and individual needs of all animals in order to best support their comfort, health, and well-being. Fundamentally, their welfare is just as important as any benefit humans may receive from their inclusion in therapy or education. In the Equine Program, humane care policies and procedures are designed to maximize the quality of life for equines, and to ensure that they are well-prepared to participate in often demanding activities with students. Green Chimneys adheres to standards for equine welfare developed by PATH Intl., as well as the American Horse Council (American Horse Council, 2009). These standards were initially developed, and continue to evolve, to advocate for the care and well-being of equines, as well as to reduce risk and promote safety for human participants in AAIs.



The open paddock is a special pasture designed to allow staff and students opportunities to spend quiet time with miniature horses and donkeys.

Equines and camels at Green Chimneys mostly live outdoors, which allows them free movement and socialization with herd mates for most of the day. For herd animals, freedom of movement is vital for proper digestion and body conditioning. Likewise, ample opportunities for social interaction are critical for equine mental health, as this allows for the development and maintenance of satisfying personal relationships, play, and relaxation. Most of the equines at Green Chimneys are provided hay as forage three times a day, with additional accommodations made for those with individualized health needs (e.g., soaking hay prior to feeding for horses who require a low-sugar diet). Hay is generally placed both in a raised trough and directly on the ground at designated intervals throughout the paddock. This encourages



separation between the animals during feeding, thereby minimizing potential disputes and/or injuries (i.e., bites and kicks) over food resources. In cases where a horse is kept in a box stall for a short period of time (e.g., in preparation for a session with a student) or longer durations (e.g., due to

inclement weather, injury or illness), hay is made readily available to the horse. Additionally, most equines receive supplemental, concentrated feed (i.e., grain), which is placed in individual feed bags. Likewise, water is always available to equines, either in large troughs in pastures or in five-gallon buckets mounted to walls within stalls.

To maintain horses' good physical conditioning and training, and to monitor for any potential health concerns, horses are exercised at least once a week by instructors, interns, or volunteers who have demonstrated skill in riding activities. These skills include: (a) the provision of clear and appropriate directional cues to the horse, (b) the confidence to ride independently, (c) the ability to maintain a safe environment for both the horse and the rider, and (d) the knowledge of what type of exercise is needed given the current body condition of the horse and his or her workload (Henneke, 2009). As needed, Green Chimneys' horses are treated with supplemental physical bodywork (e.g., chiropractic care and massage) by licensed equine professionals.

The Five Freedoms in the Equine Program

As discussed in Chapter 3, Green Chimneys is committed to ensuring that each animal at the farm receives care in accordance with the Five Freedoms, a commonly referenced framework of essential animal welfare standards. Below are descriptions of how Green Chimneys staff promote the Five Freedoms in the Equine Program:

Freedom from thirst and hunger – Equines at Green Chimneys are ensured freedom from thirst by being provided near-constant access to fresh water. Although water is not always available when equines are working with students, these sessions are limited to 45 minutes and mandatory breaks are scheduled between each session to ensure that animals have the opportunity to drink water. Freedom from hunger is met by providing equines with regularly scheduled meals and individualized supplemental feed, carefully attending to their body condition (Henneke, 2009), monitoring their nutritional intake, and adjusting their feed when needed.



Freedom from discomfort – Equine housing at Green Chimneys promotes freedom from discomfort by providing shelter from the sun, wind, rain, and snow in pastures, as well as adequate space to move and lie down (especially in box stalls). A high level of attention is also given to the fit of tack and equipment to ensure that equines are comfortable. For example, saddles are assessed for fit and re-flocked on a regular basis. The supplemental exercise and activity given to the horses outside of the work they do with students helps them maintain optimal physical conditioning, so they are better able to handle the physical demands of being ridden by less experienced individuals.

Freedom from pain, injury, and disease – Green Chimneys staff work closely with a team of veterinarians, farriers, and other professionals to ensure that horses and other equines are as free from pain, injury, and disease as possible. Physical comfort and well-being often depend on the age of the animal, prior health issues, and the nature and cost of necessary treatment services. Green Chimneys staff regularly consult on treatment and maintenance plans for horses to assess

what level of care is warranted and appropriate, given the financial resources available. Equines are given standard preventative care, such as regular dental and hoof care. Immunizations are also administered twice a year, or as needed, to support continued health and to abide by state and national laws recommending and requiring specific vaccines. On a daily basis, staff also conduct brief assessments of the physical condition of each equine (e.g., a visual scan for wounds and areas of irritation or inflammation) so that physical ailments can be treated in a timely manner.



Students participate in Learn and Earns in the Horse Barn to ensure the ongoing health of equines. The student pictured here is applying a conditioner to prevent damage to this pony's hooves.

Freedom to express normal behaviors – Green Chimneys

staff ensure that equines have the freedom to express normal, species-specific behaviors through the use of conscientious housing and feeding practices. As discussed earlier, equines are often turned out in small herds to allow for same-species interactions and free movement, which reduces stress, improves body condition, and aids in healthy digestion (McGreevy, 2004). Additionally, regular access to forage also supports proper digestion and minimizes stomach ulcers and negative stereotypies, which can have long-term, detrimental effects on the horse's internal systems and anatomical structures. Examples of negative stereotypies include cribbing (i.e., when a horse bites onto a surface and quickly inhales air) and weaving (i.e., when a horse rhythmically sways his or her front end side-to-side). A separate consideration is the suppression of some normal equine behaviors during therapeutic or educational activities with humans (e.g., movement inhibition). To manage this issue, Green Chimneys uses ethically sound training methods, and carefully monitors the stress tolerance of individual equines and activities that might modify species-typical behaviors. Based on individual animal needs, staff maintain

schedules for each equine that limit the amount of time spent in programs; continually assess and address equine stress during programs that may signify a need for respite (e.g., through changes in facial expression, body posture, and overall energy level); and balance the time equines spend in programs with the time they are given to rest.

Freedom from fear and distress – Green Chimneys staff safeguard equines from fear and distress by closely supervising their interactions – both on the ground and during mounted sessions – with students, volunteers, and interns. Volunteers and interns must demonstrate a high proficiency in horse handling before they are permitted to participate in direct work with equines. Likewise, during sessions, instructors carefully assess students on their ability to maintain balance while riding; to provide gentle cues to the horse; to attend to equine behaviors, communication, and responses; and to regulate their emotions during times of stress. This last skill is also a prerequisite for students to be allowed to manage equines independently with limited direction from the supervising horse handler. During mounted sessions, instructors also closely monitor students for any undue pressure exerted on the horse’s mouth and nasal bone by



the bridle. If needed, the instructor will take measures to adjust the rider’s hand position by instructing the student to lengthen the reins; re-position his or her hands forward; or by physically assisting with the adjustment. Careful attention is also given to the amount of uncontrolled movement and vocalization that individual students may present. Horses paired with students who display unpredictable behaviors must be genuinely tolerant in both temperament and response to avoid causing the equine distress or fear during the interaction.

Veterinary Care

The staff at Green Chimneys collaborate regularly with Mid-Hudson Veterinary Services of Carmel, NY to provide quality veterinary care for all animals housed in the Horse Barn. Vaccinations and boosters for horses, donkeys, and mules occur twice a year (in the spring and fall) and include

Vetera Eastern and Western

Encephalomyelitis, west nile, influenza,

rhino pneumonitis, platonic horse fever, rabies, and tetanus. Camels receive annual rabies,

tetanus, deworming, and Clostridium perfringens type C and D vaccines. Green Chimneys also

works proactively with veterinarians to protect horses against parasites, including via fecal exams and deworming on a bi-monthly basis.

In addition, equines are given vital rehabilitative hoof care every 5-8 weeks. Properly caring for the horses' feet and hooves is another essential component of equine health. As such, a farrier visits Green Chimneys every five to eight weeks to care for the herd and is on call to respond promptly if a horse throws a shoe. Dental exams and special procedures are performed by the equine dentist from Mid-Hudson Veterinary Services; twice annually, the dentist visits Green Chimneys to perform an oral exam for each equine and camel. Most other healthcare procedures are performed on an as needed basis. For example, all equines and camels are monitored for generalized joint stiffness or lameness and, if needed, are given joint injections once a year. Green Chimneys has also begun to incorporate massage therapy, chiropractic treatments, and acupuncture for equines at the farm.



Due to Green Chimneys' care and vigilance, there were no veterinary emergencies when mini horse Maya successfully delivered a healthy foal in May 2019. Little Cricket has quickly become a favorite on campus.

The Barn Manager is responsible for coordinating veterinary services and monitoring the health needs of equines. However, all full-time Equine Program staff are trained in basic equine first aid and are able to treat minor wounds, monitor for general equine health, and consult with veterinarians and farriers on preventive and urgent care. Veterinarians also respond to emergency cases of equine or camel injury, illness, or other presenting medical issues. To provide the best possible healthcare for equines, Green Chimneys staff regularly engage in grant writing to maintain funds for the ongoing care of older and/or ill horses. Grant funding also covers more expensive and specialized procedures, such as joint injections. Currently, Green Chimneys is working to expand the farrier budget to support rehabilitative and specialized shoes for horses who have a medical issue impacting their feet, such as navicular disease.

4.8 The Equine Program as a Context for Positive Youth Development

Equine Programming at Green Chimneys encourages students to develop skills through navigating various aspects of a complex environment, thereby providing a rich platform for PYD. Key elements of the Equine Program environment include the physical settings of the barn and paddocks, the equine animals and camels, the adult instructors and facilitators, and the student's fellow peers. It is within this dynamic context that youth are taught specific horsemanship and life skills relating to equine care, handling, and riding.

The *Big Three* of PYD in the Equine Program

Green Chimneys' interventions involving horses, other equines, and camels incorporate and feature elements of the *Big Three* (described below), which play an integral role in the effectiveness of youth development programs.



Green Chimneys offers opportunities for children, both young and old, to bond with horses and other equines.

Positive and sustained relationships between youth and adults – When working in the Equine Program, students establish positive and sustained relationships with adults who serve as instructors, facilitators, and mentors (i.e., the first component of the *Big Three*). During most equine activities, students must initially rely on adults to provide guidance and direction on how to navigate the environment and its various animals, many of whom are quite large. As students gradually build skills and confidence, they are able to transition to a role of collaboration and partnership with their adult mentors.



At times, students and their mentors may also act as “co-learners.” For example, one current Equine Program Intern expressed that she knew very little about horses at the beginning of her internship. By chance, she was assigned to a student who was also unfamiliar with horses, and had expressed feeling nervous when working around them. Over time, the intern and student were able to collaborate and engage in the learning process together, guided primarily by the Barn Manager and other staff with equine knowledge and experience. During this time, the intern supported the student in taking steps to gain comfortability around the horses and confidence in his caretaking abilities (E. Farmer, personal communication, March 28, 2019).

Activities that build important life skills – This second component of the *Big Three* recommends that children participate in activities that build general life skills. Many of the equine-focused activities incorporate important skills like basic math, organization, memory, communication, accountability, decisiveness, hygiene, and problem-solving. For example, when feeding a horse grain, students are challenged to remember measurements of feed needed for each horse. Some

horses have special dietary needs that may change from week to week, requiring students to double-check written instructions or ask for assistance if they are unsure of how to proceed.

Opportunities for youth to use life skills as participants in, and leaders of, valued community activities – This last component of the *Big Three* suggests that, to maximize PYD, youth need opportunities to apply learned skills as both a participant and a leader in their communities. This element is apparent in group riding lessons where students are asked to take turns as “the leader” by performing figures and circles, or by demonstrating certain horsemanship techniques (e.g., correct hand positions) for other young riders. Assuming a leadership position in their peer community requires that the student also develops a number of “soft skills,” such as a strong work ethic and sense of teamwork; effective and supportive communication with various members of the group; and flexibility in approach according to others’ riding abilities or a horse’s emotional state (among others).

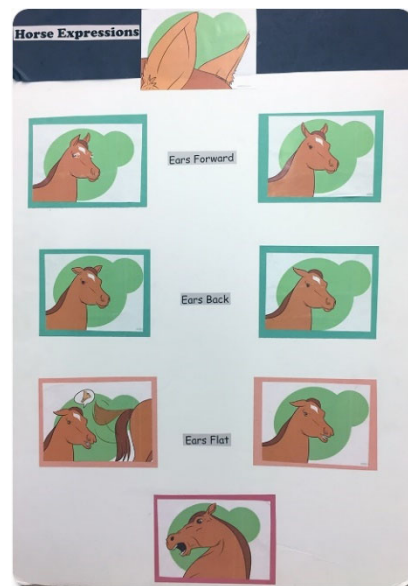


The *Five Cs* of PYD in the Equine Program

The *Five Cs* of PYD are evident in the following examples relating to Green Chimneys’ Equine Programming:

Competence – During Learn and Earns in the Equine Program, students are assigned a task from the list of daily chores displayed in the stable. To gauge the student’s current level of competence in performing the assigned task, and to provide additional guidance and instruction, the intern or volunteer supporting the student reviews the task before the activity and breaks it down into smaller steps to support student success. For instance, an intern might ask the student what tools

are needed to clean the horses' stalls and where those tools are located. The student is encouraged to lead as much of the process as possible, including selecting the right equipment, opening and closing gates, and checking off the task from the list when complete. Additionally, the student is given the opportunity to problem-solve around any notable or unexpected changes in the environment, such as if a horse has been moved to a new stall. The intern helps redirect the student as needed and acknowledges correct actions and insight with praise. Through repeated actions, as well as engaging with the intern in learning additional skills relating to the primary tasks, students gain *competence* in horsemanship activities and related, transferable skills.



As part of the 4-H curriculum, students learn various aspects of horsemanship, such as equine anatomy and behavior. Learning to identify the non-verbal cues, expressions, and calming signals of horses may help youth recognize them in other people as well.

Connection – Connection with equines in the Horse Barn can be fostered in a number of ways. During therapeutic riding activities, the slow and methodical rhythm of the horse's movement can be calming for some students, which may allow them to develop a deep sense of bonding with the horse. Additionally, when a student first meets a horse, he or she may initially be drawn to the animal via appearance only (e.g., by color or size). However, through interventions led by the child's social worker and/or intern, the student may gradually get to know the horse as an individual, and begin to feel empathy and strong feelings of personal *connection* with that particular animal. For example, the student may come to know the horse's history, physical condition, unique personality and triggers, and preferences in terms of food and activity. In turn, this allows the student to see parallels between the horse's experiences and their own, all while connecting with supportive adult staff members.

Confidence – Through mounted and unmounted horsemanship activities, students gain the ability to direct a horse’s movement and attend to the horse’s unique needs. This sense of mastery is perhaps the most evident source of increased *confidence* among students within the Equine Program setting. When asked why they enjoy horseback riding, most students will mention their newfound ability to guide the horse. In general, each riding horse weighs 1,000 pounds; as such, it is not surprising that mastering this difficult, and often initially daunting, skill can enhance a student’s sense of self worth and confidence, a fundamental aspect of PYD.

Character – Across Green Chimneys’ nature-based programs, it is quite uncommon for students to be left alone without direct adult supervision. However, preparing to mount a horse is a routine process in the Equine Program where students are required to act appropriately on their own. Prior to the student rider mounting the horse, the instructor completes a thorough equipment check while the volunteer handler directs the horse to stand in place. The student rider is asked to stand on his or her own at the mounting platform, about 25 feet away from the horse. This protocol requires the student to be patient and quiet, even though he or she is often excited to start the lesson. The students develop *character* by respecting the social norms of the lesson environment (i.e., waiting their turn and acting in accordance with the rules), even when the supervising adults are focused primarily on other tasks.

Caring – Like most animals at Green Chimneys, equines require a great deal of care, which is often provided by students by way of Learn and Earn activities. One particularly challenging task can be early morning feeding. Due to the dining hall schedule, students who participate in this assignment are asked to help feed the equines before they themselves have eaten breakfast. Yet, students often develop a strong sense of *caring* for the animals and enjoy the opportunity to provide for them, even when these tasks require that they delay fulfilling their own needs.

One riding instructor recently shared the challenges she had with a student who felt initially resistant to (and even offended by the notion of) feeding the donkeys and horses before he had the chance to eat breakfast. However, after a few weeks of participation in the Equine Program, and getting to know the animals in the Horse Barn, this student noticeably changed his attitude, even choosing to be late to his own breakfast in order to ensure that all equines had received their morning meal. In other words, he took a step he seldom had before: he put himself and his needs second, and has since continued to willingly feed the donkeys and horses each day with a sense of responsibility and compassion (V. Parody, personal communication, March 28, 2019). Likewise, students often voice their desire to help interns and other staff complete large or strenuous tasks, thereby demonstrating teamwork and empathy toward other people, as well as the animals themselves.



During the winter months, Learn and Earns may begin before the sun is up. Students demonstrate their caring and strength of character by making sure every equine starts the day with a good breakfast.

4.9 Animal-Assisted Interventions in the Equine Program

In the field of equine-assisted interventions, programs are typically divided into two broad categories: mounted and unmounted activities. Mounted activities do not occur when the weather is either too hot or too cold, windy, or when thunder is audible. Equines with muscle weakness due to old age do not participate in mounted activities, but may be selected for unmounted activities if deemed appropriate by the instructor. Mounted activities are generally more expensive due to the cost of qualified support staff and additional time and space required to safely provide this programming. However, this cost is offset by the therapeutic benefits gained from horseback riding that simply cannot be replicated through unmounted activities.

Such benefits include unique types of physical movement and increased awareness of the here-and-now (Buck et al., 2017).



Unmounted activities with equines offer students the benefits of human-animal connection on the ground. For example, students might lead, groom or stand next to equines, or they may learn equine-related information in a classroom setting without an equine present. When facilitating unmounted

activities, staff sometimes partner multiple students with the same horse, taking precautions to avoid overstimulating or stressing the animal. For students with physical limitations that preclude them from participating in mounted activities (e.g., disabilities that limit mobility or medications that cause severe imbalance), unmounted activities provide meaningful opportunities to engage with horses. Overall benefits of mounted and unmounted activities include feeling safe in the presence of a perceived nonjudgmental being, as well as comfortable and calm through touching and observing a horse (Buck et al., 2017). For more information on the documented effects of interacting with equines, see Section 4.1.

Green Chimneys continually evaluates the impact and effectiveness of its various equine-assisted interventions. Likewise, staff allocate resources to ensure that all students who wish to participate in equine programming have the opportunity to do so in whatever capacity is most appropriate for their clinical and educational goals, as well as individual abilities.

Animal-Assisted Therapies in the Equine Program

Equine-Assisted Psychotherapy – Social workers and psychologists incorporate equine-assisted psychotherapy into their work with students by first determining the primary treatment goals to be addressed and the duration needed for this type of therapy (generally a 6-12 week period).

Clinicians then consider and utilize relevant treatment approaches in the context of each session, which follow guidelines from PATH Intl. The client, mental health professional, equine, and equine-specialist work together to carry out the intervention using the “diamond model,” where each of the four participants represents a point in the diamond. The team works closely to incorporate both mounted and unmounted interventions that focus on such goals as: (a) avoiding maladaptive behaviors (e.g., jerking the horse’s reins while riding); (b) decreasing other behaviors that may be distressing for the horse (e.g., loud talking, impulsive or fast movements, rough petting); (c) increasing client engagement; (d) creating sensory stimulation through movement and touch; and (e) practicing adaptive coping skills, both on horseback and in the office at the end of the session. Below is a snapshot of how Green Chimneys includes horses and horse environments during dialectical behavior therapy (DBT) with students:

Equine-Assisted Intervention as an Adjunct to Dialectical Behavior Therapy (DBT)

A common treatment modality that clinicians use in conjunction with equine-assisted psychotherapy is DBT, which aims to promote the healthy expression of emotions by increasing adaptive behaviors through a series of skill building, exposure, and cognitive restructuring interventions (Rizvi, Steffel, & Carson-Wong, 2012). In the Equine Program, Green Chimneys staff often encourage adaptive behaviors by drawing on DBT concepts and asking students to:

- Take deep breaths
- Physically stop before approaching a horse
- Recognize how to communicate with a horse using one’s own body position
- Use respectful social and sensory cues (e.g., greeting horses verbally before haltering them)
- Build positive relationships with horses (e.g., praising the horses, giving them a gentle scratch) and the Equine Program staff (e.g., holding a door open, actively listening during instruction); and
- Stay present and focused at the Horse Barn and during the interaction

For example, one Equine Program Intern shared how she uses equine-assisted mindfulness techniques to help students gain self-awareness of how their emotions and behaviors impact others. This intern facilitated an activity where the student gently placed his hand on the horse and focused on observing the horse’s behavioral response (e.g., breath, alertness, tension). Throughout the intervention, the student became more physically relaxed and began to notice that the horse also seemed calmer in response. Overall, this student learned that both people and animals are aware of their surroundings and the actions of others, and gained mindfulness skills to help adapt his behaviors to promote positive and respectful social relationships.

(L. Dundon, personal communication, March 28, 2019)

Additionally, social workers and psychologists also incorporate miniature horses and donkeys in less structured ways by visiting the animals' enclosures during therapy sessions and encouraging thoughtful interaction:

In some cases, social workers are looking for certain sensory input or body movement. Sometimes [students] like to take a miniature horse for a walk, as a child is more responsive when [he or she] is physically moving. In some cases, [social workers] choose to work with an animal that has a specific story: for example, a therapist working with a child with a miniature horse mother and son duo to talk about relationship; a donkey who lost her mother with a grieving child; or a bottle-fed animal and a child who has [reactive attachment disorder] to explore maternal love and nurturing (M. Kinoshita, personal communication, July 25, 2017).

Camel-Assisted Individual Therapy – Largely unique to Green Chimneys is the inclusion of



Bactrian camels in animal-assisted therapy sessions and activities. Given that camel behavior can be unpredictable, interactions with camels require a controlled environment and highly skilled supervision. The inclusion of camels, Phoenix and Sage, in individual therapy sessions was initially pilot-tested by a

social work intern and one Green Chimneys student who expressed interest in working with them. Similar to equine-assisted psychotherapy (see above), the diamond model is often followed here to include the client, camel, mental health professional and camel-expert, who monitors the camel's behavior and well-being during the session. Therapeutic goals often include increased impulse control, communication skills, empathy, confidence, and sense of self-worth.

Additionally, due to their rarity (particularly as a species involved in HAI programs), large stature and relatively recent arrival to Green Chimneys, camels also offer the additional benefit of novelty, drawing attention and interest from many students. Through the development of a

camel-assisted therapy protocol and successful piloting phase with individual students, this type of intervention has recently been expanded to include both camels in groundwork activities with student groups roughly three times per month.

Animal-Assisted Activities in the Equine Program

Horsemanship Class – Therapeutic Horseback Riding (also known as Therapeutic or Adaptive Riding) is a popular activity offered within the Equine Program. Up to 15 Horsemanship Classes are held throughout the week, with no more than six hours of equine participation per day, in accordance with the PATH Intl. policies for equine welfare; equines at Green Chimneys often work far less than the maximum six hours. Four to six students participate in each 80-minute class once per week over a 10 to 11 week period. On the whole, classes are conducted according to the goals set forth by PATH Intl., and focus on specific skill-building lessons and activities. For example, students learn independence and body awareness by guiding their horse and ensuring that a safe amount of space is maintained between themselves and other people and animals. Through interacting with the horses and Equine Program staff and interns, students also gain important relationship skills (e.g., the ability to read social cues) that apply to their lives outside of the Horse Barn environment. Furthermore, as bonding with other living beings can be challenging for some students, learning how to safely connect with, and compassionately care for, equines can be very impactful (PATH Intl., 2019).



Interns and volunteers escort students to the horses they have been paired with before a therapeutic riding lesson.

Several horses take part in therapeutic riding sessions. Horses paired with students for therapeutic riding vary in height, build, and movement to accommodate various riders and to provide different sensory input according to each rider's needs. Before each riding class,

volunteers and interns groom and tack the horses, who are then brought into the center of the arena. At that time, the Therapeutic Riding Instructor assists each rider in the mounting process. Classes are 80 minutes, during which time students walk their horse; practice guiding their horse by walking in a circle or weaving through cones; learn basic riding skills; and, when able, trot their horse. When weather and time permits, classes are taken for rides on Tom's Trail (see *Green Chimneys Campus Map* on page 10); otherwise, students walk their horses along the roads that pass through the campus grounds. As needed, the Therapeutic Riding Instructor adapts activities according to the needs of class participants and equines (e.g., replacing mounted riding with groundwork activities).



Generally, lesson plans work towards standard goals for the first three class sessions. In the first session, the Therapeutic Riding Instructor sets rules and expectations for student behavior in the classroom and Horse Barn. There is a strong focus on how to behave safely in the barn when working with equines and other animals. In the second session, the instructor matches students with horses; teaches them how to properly groom their horse; and explains why this activity is important. The instructor also reviews the use of various tack and equipment. In the third session the first riding instruction begins, with a focus on stops and starts, steering, and maintaining control of the reins. If this class goes well, the instructor may take students out for a trail ride.

While these lesson plans are fairly standard, they are also flexible based on the needs and skills of the students and the primary focus of the instructor. In some classes, specific horseback riding skills are the focus, such as riders keeping their heels down; maintaining a flat, but relaxed, back; and placing hands in the proper position. In others, relaxation and mindfulness take center stage,

with students being guided by a volunteer who leads the horse so they can close their eyes, focus on the present, and envision a calm place. In all classes, there are many opportunities for students to practice social interactions, such as with peers (e.g., via conversations between students as they wait to mount their horses) or with animals (e.g., showing appreciation and affection for their horses).

After-school and Evening Programming – After-school and evening programs (or “clubs”) are designed to increase the time available for day and residential students to spend with horses and build their equine knowledge and skills. Classes are limited to a certain number of participants per session based on the activity or focus of the club. Specific programmatic offerings change throughout the year, and may include programs such as Drill Team or Rodeo Club. Both after-school and evening programs are 60 minutes long and use the same general programming, but have different names to distinguish the time of day they are offered (i.e., afternoon vs. evening).

Clubs are planned and led by the Equine Program Facilitator, with the assistance of at least one intern or volunteer. Activities include classroom-based lessons on horsemanship (e.g., horse handling and care, riding, grooming, use of gear, tacking), groundwork (e.g., leading and lunging), and riding lessons. If weather permits, the Shetland pony is also available for visits and, on colder days, is brought into the Equine Program classroom to help students learn about horse care and anatomy. Mounted activities follow the same general structure as the Horsemanship Class (i.e., Therapeutic Riding activities) described above.

Animal-Assisted Education in the Equine Program

Career Technical Education Equine Class – Green Chimneys’ equine CTE course aligns with the 4-H curriculum, *Giddy Up and Go: Level 1 Discovering Horses* (National 4-H Council, 2015); the adaptation of NYSED Special Education Common Core State Standards (2014); and NYSED Career Development and Occupational Studies Standards (2016). Course topics are taken from

the 4-H curriculum, which also offers workbooks for students to use. This course is geared toward children and youth who have their own horse or are working with one through a traditional riding program. The 4-H curriculum mainly focuses on horsemanship and civic responsibility. Student achievement is measured according to the standard measures within the 4-H curriculum, with equine management certificates offered to students through an online program adopted from the University of Kentucky. This online program also offers weekly videos focusing on equine nutrition, breeding, first aid, and other related topics (University of Kentucky Department of Animal & Food Sciences, 2019).



Horsemanship skills taught in the Equine Program include appropriate use and care of the equipment necessary for equine-assisted activities, such as saddles and bridles (left) and brushes, curry combs, hoof picks, and other grooming tools and products (right).

A student who is interested in pursuing career technical equine education is encouraged to discuss this professional interest with his or her counselor and/or social worker. Career Technical Equine Education Instructors develop lesson plans according to the number of students enrolled, and adapt areas of the curriculum to meet both NYSED Career Development and Occupational Studies Standards (2016) and the students' individualized education program (IEP) goals. This CTE program is only offered to junior (kindergarten - 7th grade) and senior (8th - 12th grade) students who have demonstrated responsible animal husbandry skills, specifically with equines.

Students selected for this opportunity must also demonstrate an ability to regulate their emotions and behaviors when they are in the presence of equines.

Learn and Earns – Learn and Earns are an important feature of Green Chimneys' Equine Program, as they provide students with the opportunity to develop vocational tools and life skills under the guidance of a trusted mentor. Here, students help



accomplish the variety of labor-intensive tasks that need to be done every day in support of the equines' health and well-being. Typically, students are paired with interns for their individual jobs; however, the Equine Program also has two seasoned volunteers who supervise Learn and Earns each week. While tasks vary according to students' abilities, they typically involve feeding and watering the horses, cleaning stalls and replacing wood shavings, transferring horses between stalls and pastures, and cleaning tack and brushes. A chore list is centrally located in the barn, and each student checks off tasks that they complete with the help of their supervisor. Chiefly, this activity challenges students to recall their recent actions and provides a rewarding sense of accomplishment.

A standard Learn and Earn timesheet is filled out before and after each 45-minute session to record the time students spend on each activity. When the session ends, the student washes his or her hands and is walked back to class by his or her mentor. The first set of daily Learn and Earns occur in the morning before school starts, with the second set taking place in the evening. Primarily, Learn and Earns focus on ensuring horses have food and water, with interns, volunteers, and/or staff members often joining students for a meal (breakfast or dinner, respectively) after their work in the Horse Barn is complete.

4.10 Summary

Humans have relied on the companionship and physical labor of equines for thousands of years. Increasingly, the inclusion of horses and other equines in human therapeutic and educational interventions has shown considerable promise in enhancing the physical, social, developmental, and mental health outcomes for diverse populations. Likewise, benefits of horse-human interactions – often achieved in a safe and engaging outdoor environment – include behavioral and emotional regulation, sensory stimulation, increased self-efficacy, and facilitated learning.

This chapter focused on mounted and unmounted equine-assisted interventions at Green Chimneys, including therapeutic riding; equine-assisted psychotherapy; and activities such as grooming, feeding, and leading. The Green Chimneys Equine Program provides a unique educational and therapeutic environment that is adaptive and flexible to the needs of each student. Several animals (including horses, miniature horse, donkeys, camels, a Shetland pony, and a pony-mule) reside at the Horse Barn, each of whom serve various therapeutic roles depending on the individual needs and strengths of young participants.

As described in Chapter 3, the Equine Program has the longest history at Green Chimneys as a formalized set of AAIs. The program is highly regarded by certifying bodies, the local community, and the student participants and their families. Therapeutic (or adaptive) riding has long comprised the majority of equine programming offered at Green Chimneys. From a logistical standpoint, therapeutic riding classes are scheduled as two consecutive periods into the standard academic day and accommodate up to six children at a time.

Moreover, Equine Program involvement strengthens the development of PYD skills through connecting students with all aspects of a complex, natural environment. The unique physical setting, positive equine interactions, and sustained relationships with adult instructors and facilitators



support youth as they learn leadership and vital life skills. Likewise, through both mounted and unmounted equine-assisted interventions, students at Green Chimneys are better equipped to develop higher levels of competence, connection, confidence, character and caring, each of which can enhance self-worth, enrich social relationships with others, and set the stage for future success. Equine Program staff are continuously refining interventions to improve the developmental, academic, and overall health trajectories of each student they serve, as well as carefully overseeing protocols pertaining to the ethical care and involvement of equines in Green Chimneys' clinical activities and educational instruction.

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Chapter 5: Wildlife Center



At the Paul C. Kupchok Wildlife Rehabilitation Center at Green Chimneys (known simply as “the Wildlife Center”), animals such as birds, rodents, reptiles, amphibians, and chinchillas receive ongoing rehabilitative care and are included in select therapeutic and educational interventions with students. Animal-assisted interventions (AAIs) in this program area seek to instill respect for wildlife in youth through (a) classroom instruction and discussion, (b) mostly indirect animal care responsibilities, and (c) supportive mentor relationships with wildlife staff.

Many of the wildlife animals at Green Chimneys are injured, displaced and/or suffering from disease, and receive rehabilitative care with the hope that they can be re-released into their natural environment once they regain their health. In order to maintain the safety of Green Chimneys students and wildlife, and to preserve the intrinsic and species-specific traits of the animals receiving rehabilitative care, students have limited direct contact with animals at the Wildlife Center. When appropriate, other resident wild animals who have been declared

“permanently non-releasable” may receive more interaction with students through the guidance and supervision of qualified Green Chimneys staff. Overall, this supportive and novel setting teaches students important life and practical skills that lead to positive youth development (PYD), such as empathy and inclusion, curiosity, self-regulation, responsibility, and communication.



During his tenure as Green Chimneys' Farm and Wildlife Director, as well as the years since he retired from that position, Paul Kupchok has overseen the rehabilitation and release of many injured birds of prey. One of the most memorable was this release of a bald eagle in 2015.

5.1 Summary of Selected Research

Currently, research on the efficacy of programs that seek to benefit the health of both wildlife and humans is limited. There is some debate as to whether the treatment of wildlife in captivity is truly beneficial from an animal welfare and conservation standpoint, as the release of rehabilitated animals may have negative ecological impacts (e.g., disease transmission and disruption of local prey-predator balances), especially when they are moved to another area (Mullineaux, 2014). As such, the inclusion of wild animals in environments marked by regular human contact must be informed by careful and continual consideration of what is best for each individual animal and the environment. While many are drawn to the wildlife rehabilitation field by a motivation to counteract negative, human-driven impacts on the global environment, others have an altruistic interest in supporting conservation efforts in their local community

(Mullineaux, 2014). Although the underlying motivation for practicing wildlife rehabilitation varies, scholars agree that the welfare of the wild animals must always be at the forefront of these programs (Cooper & Cooper, 2006; Kirkwood, 2005; Mullineaux, 2014; Mullineaux & Kidner, 2011; Vogelnest, 2008; Wobeser, 2007).

This strong commitment to ensuring and promoting animal welfare as central priorities in wildlife rehabilitation mirrors that of the ever-evolving AAI field, including humane and animal-assisted education (Tedeschi & Jenkins, 2019). According to Bexell, Clayton, and Myers (2019, p. 231), “people who are passionate and knowledgeable about animals and who model care, concern, and admiration for them,” such as AAI practitioners, play a salient role in fostering respectful relationships between children and animals – both wild and domestic. For example, an early study showed increased positive attitudes towards snakes among students in fifth through eighth grade who observed an adult handle a snake during a wildlife education program (Morgan & Gramann, 1989). Interestingly, attitudes among students who viewed a slideshow of snakes, but did not directly observe an adult interacting with them, did not change in this study, thus underlying the important role of experiential learning and adult role models in animal-assisted and wildlife education (Morgan & Gramann, 1989).



A 2012 qualitative study found that students who participated in wildlife education programming reported greater feelings of sensitivity toward wildlife, stronger interest in environmental stewardship, and a deeper sense of connectedness to nature after participating (Theimer & Ernst, 2012). Students took part in either (a) an after-school club in which fifth grade students met every two weeks to engage in natural history, outdoor skills, and recreation;

(b) an alternative high school program in which students learned to work at a fish hatchery complex; or (c) a field-based middle school program in which students studied science, writing, math, and health through hands-on experiences in a local prairie wetlands environment (Theimer & Ernst, 2012). Moreover, Kidd and Kidd (1997) interviewed 63 suburban adolescents who had volunteered in wildlife education programs to assess their characteristics and motivations for pursuing this particular area of volunteer work. Overall, interview participants reported that the following childhood experiences contributed to their positive attitudes toward



These two red-tailed hawks have been permanent residents of Green Chimneys since sustaining serious injuries from separate automobile strikes that left them unable to thrive in the wild.

wild animals and their interest in volunteering: (a) significantly higher than average rates of caring interactions with companion animals; (b) the presence of a supportive adult role model who provided social approval regarding their animal relationships; and (c) specific education in wildlife care (Kidd & Kidd, 1997). Taken together, these studies demonstrate that children and youth who receive interactive and/or hands-on education in wildlife care through the guidance of encouraging adults (i.e., the Green Chimneys model) are more likely to have positive attitudes towards wild animals and to seek out opportunities to care for their well-being in the future.

Important Considerations in Wildlife Rehabilitation Programming

In addition to prioritizing animal welfare and well-being, several other factors must be considered when establishing a wildlife rehabilitation program, especially if there is to be a central human health or interaction component (as is the case with Green Chimneys). Take the phenomenon of imprinting, which is described as a “form of learning in which an animal gains its sense of species identification” (Wildlife Center of Virginia, 2019, para. 1). When birds are hatched, for example, they learn who they are by visually imprinting on their caregiver, resulting

in a stable identity across their lifespan (Wildlife Center of Virginia, 2019). Notably, considerable or excessive human contact can also cause an animal to imprint on humans, which may have adverse consequences (Llewellyn, 2003). Mullineaux (2014) maintains that each human who comes into contact with a wild animal reduces the animal's chance of successful rehabilitation and release. In fact, a few of the birds who currently reside at the Wildlife Center are considered unreleasable because they imprinted on humans prior to arriving at Green Chimneys.

Once a bird has imprinted on humans, the process cannot be reversed; the animal will identify with humans for life, although this does not necessarily mean that a bird will be friendly or affectionate in their behavior (Wildlife Center of Virginia, 2019). Likewise, this enduring form of bonding can seriously jeopardize a wild bird's immediate and long-term survival in the wild. Habituation to humans reduces an animal's ability to deal with hazards and predators efficiently, thereby rendering his or her re-release into the wild unsafe and unsuitable (Thompson, 2014). In short, the less human contact a rehabilitating wild animal experiences the better. This fundamental tenet has informed Green Chimneys' wildlife policies and practices, which mandate that human (e.g., staff, intern, volunteer, student, and visitor) interaction with rehabilitating and releasable wildlife be kept to a strict minimum. In this way, Green Chimneys promotes the welfare and natural behaviors of wild animals, as well as the safety of human caretakers and the public.



Positive Effects of Wildlife Interventions

Although sparse, research documenting the impact of human-wildlife interaction and wildlife rehabilitation has offered promising implications for human, animal, and environmental well-

being. A 2013 study of surf scoter birds receiving rehabilitation after an oil spill compared rehabilitated oiled and rehabilitated non-oiled birds' post-survival rates to non-rehabilitated control birds, and found that the rehabilitation process itself did not decrease survivability for non-oiled birds (i.e., they did roughly as well post-release as non-rehabilitated control birds; De La Cruz et al., 2013). Further, providing rehabilitative care to birds who had been oiled during the spill increased those birds' survival rates by 14.3% (De La Cruz et al., 2013). Other research examining sea otters concluded that wildlife rehabilitation seems to be an effective conservation tool for isolated, low-density populations of animals, but is minimally effective in areas near the carrying capacity for species being rehabilitated, where re-releasing more animals of that species may increase competition for resources (Estes & Tinker, 2017).

Animal rehabilitation work also provides people with a unique opportunity to practice nurturing skills that play a central role in most social relationships. Kidd and colleagues (1996) found that nearly a quarter of the adult volunteers they surveyed reported an enjoyment of “hands-on nurturing” as the basis for their participation in wildlife rehabilitation (p. 227). At Green Chimneys' Wildlife Center, opportunities for students to demonstrate nurturance are aligned with the *Five Cs* of PYD. For example, during Learn and Earn activities, students must learn the responsibility and importance of *caring* for a wild bird by ensuring his or her habitat is clean before they have any direct interaction with the animal. Moreover, research has shown that youth who have the skills to care for those around them are more likely to show “empathy and sympathy for the feelings and experiences of others” (Lerner & Lerner, 2011, p. 46). Fostering empathy in children appears to increase prosocial and helping behaviors while decreasing verbal aggression, physical violence, feelings of anger, and externalizing behaviors (Eisenberg et al., 2013; Robert & Strayer, 2004; Stanger, Kavussanu, & Ring, 2012). As such, thoughtful AAs focused on the care of vulnerable wildlife promote human health in much the same ways as traditional education and therapy, while also having the potential of benefiting the lives of non-human animals.



Participation in wildlife education, care, and/or rehabilitation may also impact people's attitudes regarding the natural environment, as well as the interconnection between human, animal, and environmental well-being (or the One Health paradigm; Lapinski, Funk, & Moccia, 2015). A 2008

study by Kassilly and Tsingalia explored the influence of participating in "wildlife clubs" on the perspectives of participating students living in Kenya. Club activities, some of which resemble the wildlife education and mentorship offered to Green Chimneys students, included visits to national parks and animal orphanages, essay competitions on wildlife conservation, access to wildlife education materials, and opportunities for discussion with wildlife professionals (Kassilly & Tsingalia, 2008). Findings from this study's Likert-scale questionnaire suggest that wildlife club members held strongly positive beliefs about Kenya's wildlife, whereas non-members had neutral or weakly positive beliefs (i.e., one question asked respondents to indicate how strongly they agreed with the following statement: "You consider Kenya's wildlife as nature's unique gift to the country"; Kassilly & Tsingalia, 2008, p. 203).

In addition, a 2008 meta-analysis found that people experienced cognitive and emotional benefits (e.g., empathy) in response to their participation in marine wildlife tours (Zeppel, 2008). Furthermore, these experiences appeared to contribute to both onsite behavior changes, such as acting appropriately when viewing turtle nesting sites, and some longer-term changes, such as donating money and telling others about conservation issues (Zeppel, 2008). In other words, through learning about, and emotionally connecting with, marine wildlife, visitors' attitudes toward broader environmental health and conservation appeared to improve.

As youth at Green Chimneys observe, encounter, and learn about the wonders of wildlife, opportunities for personal growth present themselves, not the least of which being a growing commitment to the care and protection of the natural environment. Importantly, this may include students sharing their newfound knowledge with peers, staff, family, and the greater community. As such, the Wildlife Center at Green Chimneys has the potential of not only benefiting individual students, permanent animal residents and re-released wildlife, but it may in fact create ripples of broader change by informing and enhancing youths' attitudes towards wildlife, the environment, and nature conservation.

5.2 Overview of Wildlife Center Programs

The Wildlife Center grew primarily from the efforts and passion of Paul Kupchok, Green Chimneys' longtime former Farm and Wildlife Director. In the early 1980s, Kupchok advocated staunchly for the inclusion of wildlife animals and programming on campus. Specifically, he made the argument that a wildlife conservation and rehabilitation center could exist in harmony with the mission and goals of the existing farm programming, while also providing the school with further opportunities for student and community engagement (Kupchok, 1995). Situated in a lightly forested section of Green Chimneys' campus, the Wildlife Center offers a physical



haven from the other, relatively active program areas and classrooms (see *Green Chimneys Campus Map* on page 10). Having a designated, quiet place on campus to calmly reflect, feel safe, or become regulated can be very important for students prone to anxiety or sensory overload.

The wildlife facility and surrounding environment consist of a rustic wooden building, as well as constructed wood-pellet trails that meander between various outdoor educational displays and flight enclosures housing over 50 local and exotic birds. The Wildlife Center, well-known by the



community as a rehabilitation setting for injured and orphaned birds, specializes in working with birds of prey (i.e., hawks, falcons, eagles, owls, and vultures), although wildlife staff occasionally rehabilitate songbirds, reptiles, and other small mammals (i.e., chinchillas, hedgehogs, and squirrels) in need of care (Kaufmann, Beetz, Kinoshita, & Ross, 2015). Structured to prioritize the well-being of its animal inhabitants, the Wildlife Center includes certain sensory elements that can be engaging or aversive to some students, such as a consistently warm temperature and the distinct smells of animal food and bedding.

In 1995, Kupchok wrote an article for publication in the *Journal of Avian Medicine and Surgery* entitled, “Children Healing Wildlife Healing Children.” In this article, he describes turning “service receivers” (i.e., youth) into “service providers” as a primary objective of the Wildlife Center (Kupchok, 1995, p. 190). With supervision from staff, students are given a unique chance to help another living being heal and return home, with the intention being that the student also benefits from the intervention and, thus, may be more likely to experience a successful homecoming of their own (i.e., for youth residing on campus; Kupchok, 1995). Additionally, the Wildlife Center seeks to educate youth about animals who live beyond the backyard or barnyard. In his 1995 article, Kupchok describes how providing first-hand opportunities for students to learn about and from wildlife species can help cultivate attitudes of environmental stewardship and respect for conservation among youth. Although unusual for a school, the inclusion of wildlife rehabilitation at Green Chimneys purposefully allows children and youth to

come “face to face with the fact that, [much like them], animals can be needy and that they [the students] can play [an important] role in nursing them back to health” (Kupchok, 1995, p. 190).

5.3 General Policies, Practices, and Procedures

Staff at Green Chimneys’ Wildlife Center continuously consider the various risks and realities of working with wildlife animals in an educational environment designed to support children with psychosocial challenges and special needs. When working with wild animals who may be rehabilitated, human contact of all kinds is limited. For example, students may indirectly



Green Chimneys’ General Animal Caretaker examines a recently injured adult bald eagle.

interact with animals at the Wildlife Center by cleaning their enclosures and providing them with food or water. However, youth are generally not permitted to touch or handle wild animal residents. Likewise, animals who will eventually be re-released into the wild are never exhibited publicly.

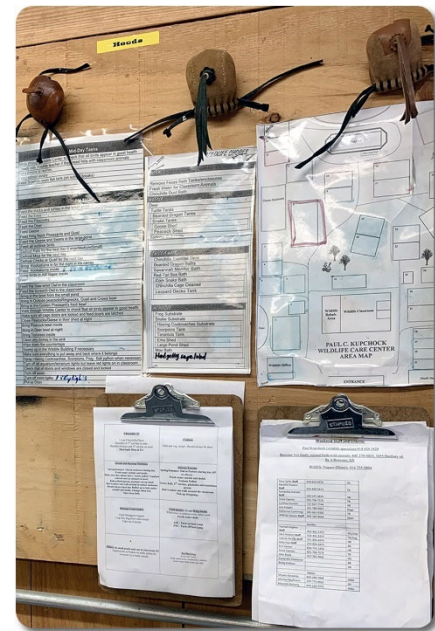
Importantly, injured wild animals receiving rehabilitative care are less predictable in their behavior than domesticated or permanently non-releasable animals, thereby underlining the need for minimal interaction with people. It is also important that potentially releasable animals maintain a

healthy fear of humans to support their survivability in the wild (M. Kinoshita, personal communication, July 23, 2019).

In order to declare an animal as permanently non-releasable, Green Chimneys staff must obtain a letter from a veterinarian describing the animal’s injury or medical issue, and the reasons why release would not be in his or her best interest. If staff at the Wildlife Center are interested in keeping the non-releasable animal on campus, they must provide documentation on why they believe he or she would benefit physically and psychologically from living in captivity. When it

is not in a non-releaseable animal's best interests to keep him or her at Green Chimneys, he or she is either transferred to a more suitable location or is humanely euthanized. In cases where non-releaseable animals mate in captivity, Green Chimneys staff may release their offspring after preparing them for a life in the wild. In preparation for release, Wildlife Center staff ensure that human-bird interaction is limited and that the bird is able to hunt live prey and fly well. As such, staff conduct a "soft release," during which an enclosure door is left open for the bird to exit and enter freely. Food is made available inside the enclosure until the bird is able to hunt on their own, at which time he or she will not return to the enclosure.

Overall, animal welfare and the safety of human participants inform the design of every intervention at the Wildlife Center. In addition to taking in injured and non-releaseable wildlife from the local and national community, Green Chimneys staff educate nearby residents on how they can safely support wild animals who may be in need of life-saving treatment. Moreover, when deciding to bring a new animal into the program, Green Chimneys staff carefully assess whether the center would be an appropriate setting for the animal based on his or her individual needs and temperament. For example, non-releaseable animals who show obvious signs of stress or discomfort when handled or touched are typically not good candidates for the program. Similarly, captivity is likely inappropriate (at least within Green Chimneys' active residential school setting) for animals who regularly make attempts to escape their enclosures or who stop eating and drinking due to probable stress. In contrast, animals who preen themselves, eat and drink normally, and appear otherwise comfortable in their new habitats often do quite well at the center. Notably, animals living at the Wildlife Center are purposefully not given names so as to remind students and

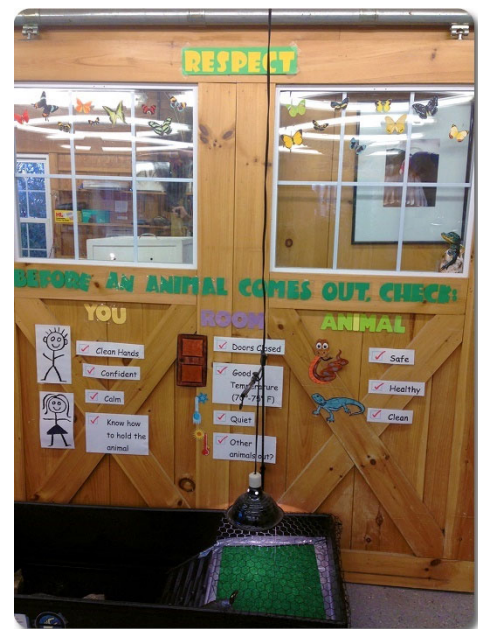


Detailed feeding schedules and enclosure maps help the Wildlife Caretaker and interns guide students through Learn and Earns.

the visiting public of the distinction between wild and domesticated animals, and how this difference changes the ways in which humans and animals interact; animals in other program areas on campus are named. This practice also aligns with Green Chimneys' overall intention to return animals at the Wildlife Center to their native habitats whenever possible.

Many wild animals thrive under the collective care approach of Green Chimneys' staff, interns, volunteers, and students. Likewise, youth are able to learn from wildlife residents through classroom lessons, indirect care responsibilities, and supportive mentor relationships with dedicated and knowledgeable adults who provide greater understanding about these remarkable animals. As with all jobs at Green Chimneys, students participating in Wildlife Learn and Earn activities receive supervision and hands-on teaching as they work. Staff or interns first evaluate student readiness by introducing them to the area, assigning them very basic tasks, and assessing their work performance. In the vast majority of cases, students do not handle wildlife animals even when assigned caretaking tasks. However, a supervised student may be able to interact with certain animals, such as those who are permanently unreleasable, if the animals initiate contact.

Additionally, a small number of students participate in a multi-step bird handling program (see Section 5.9 for more information), in which they are expected to learn and demonstrate an understanding of the birds before being allowed to hold them. A key component of this training is an emphasis on each animal's individual needs and behaviors, including habitat requirements, proper handling techniques (if applicable), and signs of distress. To create the preconditions for safe interactions with any animal, wildlife staff require that students and all other



center visitors adhere to the following posted rules, especially before an animal may be taken out of his or her habitat:

1. *Ask before touching any animal*
2. *Wash hands before and after touching all animals*
3. *Be calm (no running) and quiet (no shouting) in the center at all times*
4. *Treat all animals with respect to ensure safe and humane interactions*
5. *Remember, not all animals are safe to hold!*

Furthermore, students must heed certain rules or precautions noted for individual animals. For example, a resident blind crow cannot be housed in a larger outdoor enclosure due to the risk that the bird might harm him- or herself when given more room to fly. As an alternative, the crow currently resides in the Wildlife Center classroom, where he or she is allowed to roam freely with proper supervision. These specific guidelines are posted near the crow's enclosure, while overall center rules (see above) are displayed prominently in bright colors at the Wildlife Center classroom.

During group programs and classes, the Wildlife Teacher is aided by a teaching assistant (TA) to maintain a student-to-staff ratio of at least three-to-one (see Section 5.4 for a description of the Wildlife Teacher position). Having both a Wildlife Teacher and a TA in the classroom allows for closer supervision of interactions between students and animals, as well as quicker response times to potentially hazardous situations. For example, when a monitor lizard and a tortoise are outside of their enclosures at the same time, it is imperative that multiple staff be available to maintain a safe distance between the two species. Likewise, species-specific precautions are taken during



interactions with certain animals, such as wearing thick leather gloves when handling a raptor to protect the handler's hands and arms from the bird's sharp talons or using disposable gloves or tongs when preparing a wild animal's food.

Additionally, general Green Chimneys staff who use the Wildlife Center in their work with students must do so during the school day and when at least one Wildlife Center staff member is present. When classes or programs are not in session, wildlife staff limit the risk of unauthorized access to the center by keeping all doors locked and secure. This ensures that qualified staff members are available to supervise any unplanned interactions that may take place between a student and an animal. General staff are also trained on basic safety procedures, the use of equipment, and the overall layout of the Wildlife Center. For example, on an as-needed basis, clinical staff who accompany a student when he or she provides care for wildlife animals receive careful training on how to properly enter and exit that particular animal's enclosure.

Of note, the wildlife rehabilitation program at Green Chimneys must contend with the unfortunate reality that many animals in their care will die as a result of severe injury, habitat displacement and other complications, often leading to profound grief. In years past, Green



Chimneys would announce the death of every resident animal to the entire campus. However, staff have learned over time that doing so may trigger some students by bringing up memories of other painful losses. At present, staff consider a number of factors before communicating the death of any animal to students, including the child's (a) ability to understand death and loss; (b) methods of processing information; (c) age and trauma history; and (d) role and level of involvement in the animal's care (Kinoshita, 2015). Program area and administrative staff also ensure that

clinicians, other key personnel, and/or parents are made aware when an animal passes away in order to provide timely and appropriate support to grieving students. Notably, children and youth are often provided with an onsite memorial space in which to collectively grieve; share memories; and leave pictures, messages, flowers, and other mementos.

Moreover, as a therapeutic school and mental health treatment center for youth, Green Chimneys is well positioned to support students, staff, and volunteers through the highly personal bereavement process. When working with a student who is grieving, Green Chimneys staff always consider his or her (a) age and developmental stage, (b) psychosocial or mental health challenges, (c) typical coping mechanisms, and (d) the level of fondness or attachment he or she shared with the deceased animal(s). Each of these factors greatly shape how the student will understand and come to terms with the loss, and inform any long-term support he or she may need. Overall, the death of any animal at Green Chimneys, while often heartbreaking, presents students and staff with an important opportunity to discuss a central, shared experience in a supportive environment, and to develop coping skills that will help them manage the loss of other meaningful relationships – both human and animal – throughout their lives. Green Chimneys also strives to teach children about death and loss on an ongoing basis by incorporating topics related to end-of-life care and euthanasia into Farm Science class curriculum and activities (Kinoshita, 2015).

5.4 Staffing

Programs at the Wildlife Center – including the daily care of animals, the overall upkeep of facilities, and the development and implementation of student activities – are supported by a staff of three full-time employees, one part-time program consultant (i.e., a Wildlife Center Specialist and Program Consultant), one intern, and approximately four to six trained volunteers. Additionally, staff from other departments (e.g., social workers, Residential

Counselors) regularly support and interact with the Wildlife Center classroom by helping to supervise youth or by visiting the center for one-to-one student sessions.

Wildlife Caretaker – The Wildlife Caretaker is responsible for the management and care of all birds, reptiles, amphibians, insects, and mammals housed within the Wildlife Center. This person holds several wildlife rehabilitation licenses issued through the U.S. Fish and Wildlife Service (USFWS) and the New York State Department of Environmental Conservation (see Section 3.2 for details). As a licensed wildlife rehabilitator, the Wildlife Caretaker is also responsible for overseeing the release of animals who he or she deems eligible and ready for re-release to their natural habitat.

Wildlife Teacher – The Wildlife Teacher is responsible for the development and facilitation of the wildlife curricula and classes, and for assisting the Wildlife Caretaker in the humane care of all animals residing at the Wildlife Center. This role requires the educator to have strong teaching skills and a keen understanding of how to responsibly care for wildlife animals in the context of rehabilitation.



General Animal Caretaker – The General Animal Caretaker assists the Wildlife Caretaker and other program area colleagues, and manages the Wildlife Center when the Wildlife Caretaker is out of the office. Additionally, this person supports interventions and tasks in the Teaching Barn (e.g., 4-H programming, rehabilitative hoof care; see Chapter 6). The General Animal Caretaker focuses primarily on animal care duties such as feeding, cleaning, and providing species-specific

enrichment to resident wild and farm animals. Other key responsibilities include mentoring students through Learn and Earns, and serving as an intern supervisor in the absence of other full-time staff.

Wildlife Program Intern – The Wildlife Program Internship occurs over a period of four or eight months (either January through August or September through December), with one intern being accepted into the program per period. Due to the relatively demanding nature of this role, this intern receives an extensive four-week training course covering such topics as the care and proper handling of wildlife animals; Therapeutic Crisis Intervention; and general policies, practices, and procedures at Green Chimneys and the center specifically. Upon completion of this training, this individual facilitates Learn and Earn programs and one-to-one mentoring of students at the Wildlife Center. Interns in this program are supervised and guided by the Wildlife Caretaker and Farm Education Program Manager (see Chapter 6) to support the center’s daily operations, including cleaning, feeding, and direct animal care. Additionally, this intern supports wildlife education classes by supervising students, promoting their engagement in learning, and demonstrating safe handling practices (where appropriate). As needed, this individual also assists students who are having difficulty regulating and may need to step away from the group to focus on a different task or activity.



Wildlife Center Specialist and Program Consultant – Paul Kupchok (see Section 5.2) continues to support the operations of the Wildlife Center as a part-time specialist and program consultant. Overall, Paul uses his expertise as a licensed wildlife rehabilitator and falconer to oversee the care and rehabilitation of wild birds, as well as the licensing requirements for

keeping them at Green Chimneys. Additionally, he serves as an advisor on bird care, is on call at all times, and provides weekly supervision to staff at the Wildlife Center.

5.5 Facilities and Tangible Resources

Staff at the Wildlife Center use typical classroom amenities – such as SMART Boards, projectors, computers, and tables – for Wildlife Classes (see Section 5.9) and other educational activities. Additionally, specialized resources are used to provide high quality, species-appropriate enclosures and care for the wildlife animals living onsite (see Table 5.5.1 for more information).

Table 5.5.1. Wildlife Center Resources

<i>Generalized resources</i>	<i>Species-specific resources</i>
Well-insulated walls and doors without holes or gaps	Interior and exterior enclosures of various sizes
Operational sink and ample countertop space	Natural materials for different habitats and species (e.g., foliage, logs, rocks, nesting materials)
Cleaning and sanitation supplies	Enrichment supplies (e.g., areas for exercise, “toys” that promote species-specific behaviors)
Hard floor surfaces throughout	Heat lamps
Refrigerators and/or freezers for food storage	Food (e.g., fresh vegetables, seeds, grains, insects, rodents)
Disposable gloves and tongs for food handling	Leather gauntlets and hoods for handling raptors

Outdoor, open-air enclosures at Green Chimneys are designed to house raptors and other birds of prey. Situated along wood-chipped paths, these habitats are of varying size and dimension according to the needs of each bird species, as well as USFWS and New York State Department of Environmental Conservation regulations and standards established by the Raptor Center at

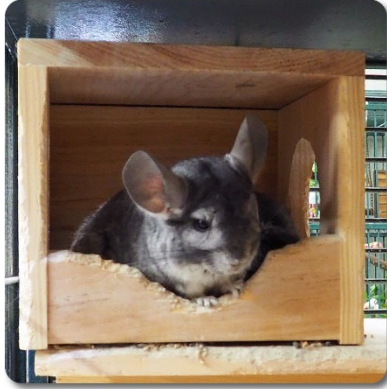
the University of Minnesota (as recorded in *Raptors in captivity: Guidelines for care and practice*; Arent, 2018). For other migratory bird species, the USFWS and Green Chimneys' Wildlife Center use care standards established by the National Wildlife Rehabilitators Association (i.e.,



Wildlife in education: A guide for the care and use of program animals; Buhl, Schlieps, & Smith, 2018). In accordance with federal and state regulations regarding the care of birds used in educational programs in captivity, all enclosures are purposely set back from the path to give the birds space from humans, and to reduce any stress caused by visitors, students, and/or other animals. In total, there are 46 outdoor habitats for animals at the Wildlife Center, including the large duck pond, rehabilitation enclosures, and habitats for tortoises.

5.6 Animals at the Wildlife Center

Approximately 50 different wild and exotic animal species live at Green Chimneys' Wildlife Center, which specializes in the treatment, care, and/or rehabilitation of birds of prey. Domestic and rare breeds of birds –including an Andean Condor, a Griffon Vulture, Eurasian Eagle Owls, Barred Owls, Barn Owls, Screech Owls, Red-shouldered Hawks, Peregrine Falcons, crows, ducks, geese, a woodpecker, and a kookaburra – are sheltered at the Wildlife Center, some of whom are unreleasable due to human imprinting and/or severe injury. Most birds spend the majority of their time in outdoor flight enclosures, although some are brought indoors at night. Although all enclosures are designed to block the wind, rain and snow, some birds who are native to a warmer climate may be brought indoors or provided shelter with a heating lamp during the winter months. Inside, the walls of the Wildlife Center are lined with habitats that



house a diverse range of other wildlife animals, including various insects; a tarantula; two chinchillas; a tortoise; and a variety of turtle, lizard, and snake species.

5.7 Considerations for the Humane Care of Animals

All Wildlife Center staff are trained in animal care and handling procedures, and advocate for the individual needs of animal residents. For example, a sign posted near the kookaburra habitat reminds visitors to refrain from standing too close to the enclosure for long periods of time.

This is because the kookaburra often vocalizes (i.e., when alarmed, to establish territory, or for mating purposes) by making a laughing sound when visitors stand near her enclosure, and she can quickly become overheated or stressed after “laughing” excessively. In addition, through expert and diligent care, Wildlife Center staff identify any medical needs, respond to them promptly, and work collaboratively with a local wildlife veterinarian to treat the animal’s injuries or conditions. Overall, staff at the Wildlife Center thoughtfully integrate practices and lessons that promote animal well-being into every aspect of their work, from cleaning enclosures, to displaying animals for



public view, to working with students (see below and Section 5.3 for general policies, practices, and procedures at the Wildlife Center).

The Five Freedoms at the Wildlife Center

Freedom from thirst and hunger – Animals at the Wildlife Center are ensured freedom from thirst by having constant access to fresh water within their enclosures. An animal included in educational programming might be taken out of his or her enclosure for a class or presentation, but the length of these activities is limited so as not to deprive the animal of water or nourishment. Wildlife Center staff are educated on how to assess the physical welfare state of individual animals and how to appropriately respond to any presenting needs or issues. For example, if staff notice that a bird is panting, frequently moving around on the handler's glove or trying to fly away, they will opt to remove the bird from educational activities for the day.

In addition, diets are specific to the species and individual needs of the animal, and may include fresh fruits and vegetables, seeds, grains, meat, or insects. Each bird, for example, has a specific diet that Wildlife Center staff monitor by spot cleaning his or her enclosure every day and keeping track of any uneaten food. This process helps the team determine how much food each bird should be fed the following day, or if they should be temporarily fasted; fasting is a common procedure when caring for birds of prey in captivity, as they typically do not need to eat every day when in the wild. If a bird does not eat all they are given in one day, they may be fasted the following day. In contrast, if they do eat all the food they are given, they will be provided with extra food at the next feeding. Wildlife birds and classroom animals who are able to be handled (i.e., those deemed permanently unreleasable or who do not mind human contact) are also monitored and



weighed regularly as an indicator of their overall health and dietary needs (P. Kupchok, personal communication, July 24, 2019).

Freedom from discomfort – Housing for animals within the Wildlife Center is adjusted throughout the year to meet the environmental and temperature needs of various species, and to prevent them from becoming weary or bored. Both indoor and outdoor enclosures provide shelter from the wind and rain, as well as multiple perches for birds to rest. Perches are typically made from natural wood, branches, and/or sticks; however if wood needs to be purchased to create a perch, wildlife staff will first cover it with Astroturf to prevent any painful sores or wounds on the bird's feet that may lead to serious infection. In preparation for a release to the wild, staff will also help birds gain strength by housing them in a flight enclosure, which provides more space for exercise and activity.



Although this Andean condor is no longer able to fly, his outdoor enclosure is still spacious enough to stretch his wings to their full span – approximately 9 feet.

As mentioned above, all wildlife animals who participate in human-related activities or interventions are monitored closely for behavioral signs of discomfort or fatigue, and are removed from the situation if deemed necessary. As these stress-related or calming signals vary by species and individual animal, a key responsibility of wildlife staff is to know each animal's general temperament and social tolerance levels (e.g., how much handling is the animal able or willing to accept?). For example, birds who open their beaks or drop their wings during human interaction may be in distress, and are typically examined and/or transferred from the situation to a more comfortable environment. The length of human interaction, as well as recovery time

between sessions or activities, ultimately depends on each animal's preferences, needs, and inherent nature. That being said, Green Chimneys staff are committed to restricting human contact for all animals living at the Wildlife Center, especially for those who are receiving rehabilitative care for future re-release.

Freedom from pain, injury, and disease – The Wildlife Caretaker works in close collaboration with other wildlife staff, including the General Animal Caretaker, Wildlife Program Intern, volunteers, and veterinary partners to monitor and assess animals for any pain, injury, or disease. As a licensed wildlife rehabilitator, the Wildlife Caretaker can often identify and treat most minor animal injuries. In the wild, birds must mask any signs of sickness, weakness, or physical trauma in order to survive and protect themselves from predators, and often do not communicate they are unwell until the situation is dire (P. Kupchok, personal communication, July 24, 2019). Therefore, a key competency of all wildlife rehabilitators is to become familiar with each individual animal in their care through carefully observing, monitoring, and understanding his or her behavior, eating habits, and overall health. As always, handling wildlife is kept to a minimum, as this often stresses the animals and may place them at risk for injury.

Freedom to express normal behaviors – Overall, wildlife animals at Green Chimneys are given enclosures large enough to allow for freedom of movement, and to express and engage in typical behaviors. In cases where the animal has sustained a permanent injury or is receiving active treatment, staff



may intentionally limit his or her movement to prevent further pain or health issues (e.g., via providing a somewhat smaller, but still spacious, living environment where the animal may be

disinclined to move quickly and/or fly). Special attention is also paid to the design of enclosures so that they resemble the animal's natural habitat as closely as possible. For example, a woodpecker currently lives in an enclosure filled with familiar branches and logs, which allows the bird to express typical behaviors (i.e., pecking and drilling into natural wood) despite living in captivity. As discussed above, perches are also very important to the welfare of birds at the Wildlife Center, as they spend most of their lives in the wild in trees high above ground.

Additionally, Wildlife Center staff ensure that birds without permanent injury have opportunities to engage in instinctual hunting behaviors by providing intentional enrichment activities. For example, staff may drop a deceased fish into a kookburra's water bowl for the bird to practice diving skills; hide food throughout the enclosure for ravens and crows to find; or sprinkle mealworms on the ground to reinforce foraging behavior in quails, turkeys, and pheasants. Moreover, contact between humans and wild animals is limited in order to preserve the animal's natural behaviors.

Freedom from fear and distress – By following federally regulated guidelines for housing captive wild animals, Green Chimneys ensures that all enclosures meet the size and space needs of the resident species, and that they are set back from visitor trails and other program areas to prevent fear and distress. As discussed previously, before any class, program or event, wildlife staff carefully consider whether the inclusion of a particular animal is necessary, suitable, and in his or her best interest. Moreover, staff members monitor for any signs of distress during all wildlife activities; if the animal's well-being appears at all compromised at any time, staff will discontinue the session and attend to the animal's immediate needs.

Veterinary Care

The Wildlife Center works with a local veterinarian in Brewster, NY, who offers his services to Green Chimneys free of charge. The veterinarian performs wellness checks on all of the Wildlife Center animals at least twice each year, and visits more frequently if staff have concerns about any animal's well-being. On average, the veterinarian visits about once per month. Notably, most minor health issues experienced by birds and other animals at the Wildlife Center and classroom can be treated by the Wildlife Caretaker, who is also a licensed wildlife rehabilitator. By consulting regularly with Brewster Veterinary Hospital, the Green Chimneys team is able to determine if an animal needs care beyond that which the Wildlife Center can provide.



Injured wildlife who require frequent attention can be housed inside the Wildlife Center. These enclosures also provide overnight and winter housing to more sensitive birds, such as the kookaburra.

5.8 The Wildlife Center as a Context for Positive Youth Development

The Wildlife Center at Green Chimneys provides a unique setting for PYD, exposing students to a variety of animals whom they would otherwise be unlikely to encounter, at least in close proximity. Through this opportunity to observe and interact compassionately with wildlife, students learn and develop essential life skills while fostering positive interpersonal relationships.

The *Big Three* at the Wildlife Center

Positive and sustained relationships between youth and adults – At the Wildlife Center, students are able to develop positive and sustained relationships with adult instructors and animal caretakers. For example, students work under the guidance of staff, interns, and

volunteers to provide daily, indirect care for the animals during Learn and Earn activities. Principally, students are able to observe positive adult role models interact with wildlife animals (many of whom may present certain behavioral challenges) in a caring, safe, and consistent manner. In this way, the adult is modeling how he or she would respond if the student were to act out, which helps form the basis for a positive and trustworthy relationship. Recently, the Wildlife Program Intern shared that he worked with a student who had experienced difficulties at home and, as a result, struggled with trusting people. However, through the program's reliable consistency of rules and expectations, scheduled tasks and adult mentors, the student was able to gradually build meaningful relationships with the wildlife staff and animals – bonds based on trust that allowed him to contribute positively to animal care and other responsibilities (J. Boyle, personal communication, March 29, 2019).

Activities that build important life skills – By helping to provide humane care to animals living at the Wildlife Center, students learn important life skills such as responsibility, empathy, communication, and time management. Moreover, students often work together to accomplish feeding and cleaning tasks, which provides valuable lessons in teamwork, cooperation, and



The Wildlife Center offers many opportunities for students and staff to face their fears and make unusual human-animal connections with cockroaches, baby pythons and tarantulas, among other species.

mutual support. Although direct contact between students and animals is minimal, youth are encouraged to step out of their comfort zones at the Wildlife Center by studying unique and, in some cases, formidable animals; showing others respect by following program rules; and trying something completely new. Ultimately, this helps build confidence, mastery, and self-control by teaching youth specialized skills and showing them that they can overcome their fears.

Opportunities for youth to use life skills as participants in, and leaders of, valued community activities – Students at Green Chimneys learn in community and often work together to complete important tasks and activities. Through these processes, students connect with peers and adults about their shared experiences, and teach each other about the new skills or knowledge they have developed in their work at the Wildlife Center. On occasion, students have the opportunity to participate in releases of birds to the wild, which offer a special opportunity for youth to honor a relationship by saying goodbye; to share how they themselves have grown with staff, peers, and members of the public; and to demonstrate new skills, knowledge, and leadership with the Green Chimneys and local surrounding communities.

The Five Cs of PYD at the Wildlife Center

Competence – Students who work at the Wildlife Center learn both simple and more challenging tasks related to specialized animal care. For example, through Learn and Earn programming, a student may work under the guidance of an intern to properly provide food for the blind crow or to clean her water bowl. When first learning tasks like these, a student often needs considerable instruction and assistance. However, over time, students complete these tasks with greater ease and independence, thereby gaining a sense of *competence* through mastery of skills that provide value to other living beings.

Connection – Students have opportunities to build myriad connections at the Wildlife Center, whether they be with animals, adult mentors, or fellow students. For example, youth might work together as a team to complete a designated task, such as cleaning an injured chinchilla’s habitat on a daily basis. In this scenario, one student might hold the instruction clipboard, while others assist with sanitizing the enclosure, replacing soiled hay bedding, or washing the chinchilla’s food and water dishes. Strengthened by a shared sense of empathy for the animal’s well-being and quality of life, these coordinated efforts build camaraderie and *connection* among students as they work collaboratively to accomplish a rewarding common goal.

Confidence – As students experience success at the Wildlife Center, their *confidence* steadily builds. Success for some students may be advocating effectively for a tortoise in need of respite by remembering and applying previous lessons on tortoise-specific needs and stress behaviors. Likewise, a student may conquer a personal phobia by taking small steps toward a tarantula or by being in the same room as a snake or vulture. Not only do these tasks increase confidence and self-assurance, but they also serve to deconstruct biases regarding certain animal species



Character – Caring for other living beings in need promotes *character*, compassion, and positive growth. At Green Chimneys, youth are able to find their niche by helping diverse and often misunderstood species, many of whom have been subjected to the negative consequences of human activity in the wild. Learning about the varied experiences and abilities of wildlife

helps Green Chimneys staff instill empathy and respect for animals and the natural world we share. Likewise, providing for the everyday needs of vulnerable living beings teaches students responsibility, dedication, and patience.

Caring – Relationships with injured or distressed animals living in captivity, even if from a distance, provide important nurturance opportunities for youth. Students at Green Chimneys often learn about *caring* while helping gather bandage materials so that staff may wrap an injured bird’s leg, or by thoughtfully cleaning a baby duck’s enclosure to improve that animal’s quality of life. Likewise, students living in the residential facility may naturally empathize with an animal at the Wildlife Center who now lives somewhere other than his or her home of origin.



5.9 Animal-Assisted Interventions at the Wildlife Center

AAIs at the Wildlife Center focus on teaching and supporting youth through the indirect care of wild animals and their habitats. Primarily, students engage with wildlife by participating in occupational therapy sessions, educational classes, Learn and Earn tasks, and, to a lesser extent, rehabilitation and animal handling activities. Depending on the focus of the intervention, students work closely with program staff and interns, occupational therapists (OTs), educators and TAs, volunteers, and/or fellow students at the Wildlife Center.

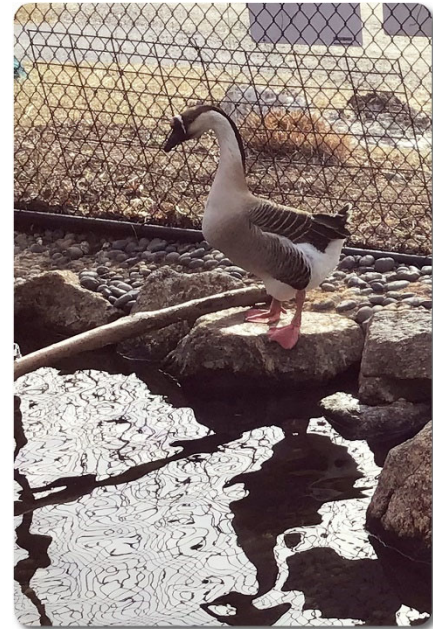
Animal-Assisted Therapy at the Wildlife Center

Wildlife Animal-Assisted Occupational Therapy – At the Wildlife Center, OTs work with individual students during one-on-one therapy sessions or via Learn and Earn activities to

strengthen their abilities to engage in school, work, recreation, and everyday life. For example, students may improve their fine motor skills by cutting food into small enough pieces for a wild bird to eat. Likewise, an OT might teach students Career Technical Education (CTE), time management, and organizational skills by guiding them through the process of completing their timecards. Overall, the Wildlife Center offers OTs a dynamic setting in which to creatively tailor activities according to each student's therapeutic goals.

Animal-Assisted Activities at the Wildlife Center

Visiting Lucy at the Duck Pond – Lucy, a male domestic African goose, is well-known for his loud calls that echo across campus. Having imprinted on humans, Lucy is a permanent resident of Green Chimneys and one of the few wildlife animals who has been given a name. Interactions with Lucy at the Duck Pond are often unstructured and/or spontaneous, and serve as an important enrichment activity for many students who gain comfort from his presence and enjoy spending time with him.



Bird Handling Training – On rare occasions, students who have demonstrated consistently safe behavior at the Wildlife Center, as well as thoughtful consideration for animal and habitat care, may be given the opportunity to learn how to handle a permanently unreleasable bird. Selected students work with the Wildlife Caretaker to fully understand the procedures required to safely and responsibly handle a bird on their hand using a leather glove for protection. This activity allows students to practice self-control and motor skills, and provides them with opportunities to teach others about a particular bird species and how they may collectively advocate for wildlife and the natural environment.

Wildlife Rehabilitation – As discussed throughout this chapter, human contact with releasable wildlife currently undergoing rehabilitation at Green Chimneys is restricted in order to mitigate animal stress, and to support a successful return to the wild by ensuring animals retain a healthy fear of humans. As such, students largely contribute to wildlife rehabilitation through contact-free caretaking, such as working alongside the Wildlife Caretaker to prepare an animal’s meal or proper shelter.

Birds of Prey Day – Each spring, Green Chimneys hosts Birds of Prey Day, an annual event that has increased the visibility of the Wildlife Center, and highlighted the importance of wildlife conservation and stewardship, for members of the local community. Typically, 5,000 to 6,000 people attend, with admission proceeds reinvested back into the Wildlife Center’s programming (M. Kaufmann, personal communication, March 21, 2017). At this event, esteemed falconers from across the Northeastern U.S. come to Green Chimneys to display and celebrate a wide variety of avian species. In addition to learning more about wild birds, student participants at this event are able to practice social and leadership skills by engaging with members of the public and wildlife experts. Releases of rehabilitated birds occur both during Birds of Prey Day and as warranted throughout the year (see below for more information).



Bird Releases – From time to time, students will assist with the release of a fully rehabilitated bird who is ready to return to the wild. The release of a bird is always a special time on campus; often, birds are released in honor of someone who has passed away or to commemorate a momentous occasion. A powerful metaphor is created when a student who is being discharged

assists with the release of a bird. Notably, this also gives the community at Green Chimneys a chance to come together and celebrate the parallels between the bird's rehabilitation journey and the student's own success and readiness to move on to a new and exciting chapter in his or her life.

Animal-Assisted Education at the Wildlife Center

Wildlife Class – Wildlife Class at Green Chimneys provides students with a comprehensive understanding and appreciation for wildlife, and encourages youth to explore the interconnectedness they share with the natural environment and other living beings through further learning and advocacy. On a weekly basis, the Wildlife Center hosts 20 45-minute Wildlife Classes, each led by one TA and consisting of up to six Green Chimneys students. Lessons traditionally focus on the natural habitat, diet, and behaviors of a specific breed or species, and may conclude with an opportunity for students to interact with the animal or insect (e.g., holding a snake or cockroach or closely observing a chinchilla who has been placed in a pen outside his or her enclosure). Other activities teach students how to appropriately conduct



themselves around a wildlife animal; for example, the instructor may encourage students to practice self-regulation skills to control their bodies and voices in order to foster an environment in which animals feel safe enough to engage in play and other natural behaviors.

On the whole, wildlife topics and content remain constant across class sessions, with minor modifications made based on each student's developmental age and interests. These classes are semi-structured, curriculum-driven interventions that meet several core educational standards and allow students to take an active role in their own learning. Students who participate in

Wildlife Classes receive partial school credit and are graded quarterly based on their level of participation, positive attitude, safe behavior, and retention of concepts and skills covered during class. While every student is given the opportunity to partake in Wildlife Class, youth may elect to opt out or to participate differently in the intervention. According to the Wildlife Teacher,

A student was afraid of one of the animals living at the Wildlife Center and, because of this, she did not want to participate in the intervention. She could stand outside of the classroom, observing through the window. She soon became comfortable enough with the animal to enter the classroom, and by the end of the class session, she had entered the classroom and was interacting with an animal [who] had previously frightened her (M. Robbins, personal communication, March 24, 2017).

Accommodations are often made so that students feel comfortable when engaging with wildlife animals. For example, if an interested student is afraid of live snakes, he or she can observe interactions between staff and a snake from a distance or behind glass, study snake behavior online, or choose an alternative activity.

Learn and Earns – Under the mentorship and supervision of a wildlife staff member or intern, students contribute to the routine care of resident animals at the Wildlife Center for one hour each week. Daily Learn and Earn activities in this program area mainly consist of observing and discussing animal behavior, cleaning enclosures, and providing wildlife with fresh food and water. In essence, participating students gain important CTE skills – such as practicing how to self-regulate, follow instructions, think critically, and work collaboratively – while providing empathic care to wildlife animals in need.

5.10 Summary

The Wildlife Center provides a unique, natural setting for students to engage in experiential learning and positive interactions with staff, peers, and resident animals. While some children may initially feel nervous at the thought of working in close proximity to wild animals, conquering fears and demonstrating progress in this environment often serve to enhance a student's confidence in his or her abilities. Likewise, these interventions allow for broader conversations about bias and the universality of fear, including how one may respect diversity or cope with anxiety in other life situations. For example, within the context of Wildlife Center activities, in-depth discussions may take place around such questions as:

- *Why are we sometimes afraid of things we are unfamiliar with?*
- *How can we approach or confront a fear through small, manageable steps?*
- *What actions can I take to help manage my anxiety during times of uncertainty?*
- *How can we support others when they are afraid?*
- *How do I engage with others who are different from myself?*

The Wildlife Center also serves as a supportive environment for students as they develop vital self-regulation skills. For example, a student may choose to engage in a personally grounding activity – such as visiting with Lucy at the Duck Pond or refilling an owl's water dish – during times of emotional stress. Indeed, even seemingly simple activities like these can be calming for students and can help them self-regulate sufficiently to return to class and/or other settings across campus.

Notably, the Center's focus on wildlife care and rehabilitation also gives students opportunities to assist with nurturing other living beings, which in turn increases the animals' likelihood of a safe and successful return home if they can be re-released into the wild. Through this indirect caregiving process, students often actively participate in respectful AAIs; develop empathic

concern for wildlife animals; feel self-assured in the skills they have mastered and lessons they have learned; show leadership as they share their newfound knowledge with others; and aid in their own homecoming or educational success.

Integral to each wildlife intervention is the safety of animal and human participants. As such, Green Chimneys staff carefully consider whether the Wildlife Center would be an appropriate setting for both animals and students based on their individual needs, personalities, and temperament. Strict policies and rules are enforced by program staff, interns, and TAs in an effort to create mutually beneficial environments where youth can learn and foster connections and animals can thrive. Learning about responsibility and compassion for wildlife may also translate to an increase in critical interpersonal and CTE skills, such as communication and time management. Moreover, as students develop greater awareness of themselves and other individuals at the Wildlife Center, they may feel more comfortable talking with adults, members of the community, and one another. In these myriad ways, the Wildlife Center plays a central role in the positive growth, education, and development of youth at Green Chimneys.



5.11 References

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Chapter 6: Teaching Barn



The Teaching Barn at Green Chimneys provides a supportive and sensory-rich environment where students can interact with, and help care for, a diverse array of farm animals – from a Potbelly pig to a Golden Comet chicken to a Jersey cow. This dynamic therapeutic and educational setting often motivates youth to foster meaningful relationships with animals, fellow students, and adult staff while learning a variety of practical, interpersonal, and essential life skills. The Teaching Barn is often a bustle of activity and novel experiences. Depending on the individual, certain sensory elements – such as the sundry smells and noises of the barn, the tactile texture of a sheep’s wool, and the broad range in animals’ size, shape and vocal timbre – can either be calming or over-stimulating which, in turn, could make it difficult for some students to self-regulate in this setting. As such, every effort is made to gradually expose students with varying degrees of sensory sensitivity to the layout and various animal species of the Teaching Barn environment. With time and graduated exposure, many students truly thrive at the Teaching Barn, partaking in engaging animal-assisted interventions (AAIs) and activities that integrate the *Big Three* to strengthen the *Five Cs* of Positive Youth Development (PYD).

6.1 Summary of Selected Research

Documented Psychosocial Benefits of Animal-Assisted Interventions in Farm Settings

The potential for youth to experience psychosocial benefits and social-emotional learning (SEL) through farm AAIs is promising, although research is limited and has often been based on perceived or self-reported effects. Further, many studies on farm-based interventions do not separate direct interactions with farm animals from those with the broader farm environment, such as baling hay or pulling weeds. To date, studies on farm interventions also vary significantly in terms of activity, client population, and animal species; for example, one might involve trimming goats' hooves, another milking cows, and a third mucking stables. This variety of possible interventions in a farm environment is an advantage in practice, as it allows for adaptation according to the client's or student's unique needs, interests, and therapeutic or educational goals (Hassink, De Bruin, Berget, & Elings, 2017; Kaley, Hatton, & Milligan, 2019; Pedersen, Ihlebaek, & Kerkevold, 2012). However, it can make the design and implementation of rigorous research in this area somewhat difficult.

Nevertheless, a number of research studies have documented important psychosocial benefits associated with farm AAIs and environments, particularly for adult populations. For example, several studies have found that farm AAIs can reduce symptoms of anxiety and depression (Berget, Ekeberg, & Braastad, 2008b; Berget, Ekeberg, Pedersen, & Braastad, 2011; Hassink et al.,

2017; Kaley et al., 2019; Pedersen, Martinsen, Berget, & Braastad, 2012; Pedersen, Nordaunet, Martinsen, Berget, & Braastad, 2011), and improve participants' sense of self-efficacy (Berget,



Students have the opportunity to use a clicker to train sheep to perform activities, such as touching her nose to a tennis ball or the trainer's cheek.

Ekeberg, & Braastad, 2008a; Berget et al., 2008b; Pedersen et al., 2011). Improvements in self-efficacy may stem from frequent opportunities to develop practical skills, as well as a sense of mastery and competence, when working with farm animals (Gorman, 2019; Granerud & Ericksson, 2014; Hassink et al., 2017; Steigen, Kogstad, & Hummelvoll, 2016). Likewise, current research suggests that interacting with farm animals in the context of occupational therapy, career technical education (CTE), and animal care activities has positive impacts on self-esteem and coping abilities among youth and adults with a variety of behavioral, mental, and psychological disorders (Berget et al., 2008a; Berget et al., 2008b; Hassink et al., 2017).

In one of the most rigorous studies to date, 29 adults with clinical depression were randomly assigned to either a farm-based intervention with cows ($n = 16$) or a wait-list control group ($n = 13$; Pedersen et al., 2012). All study participants continued their regular treatments of psychotherapy and/or medication, with those in the intervention group also working twice a week with a farmer in a cowshed for a total of three months. Depending on the farm's size, degree of mechanization and labor needs, each biweekly session lasted between 1.5 to 3 hours. Participants in the intervention group interacted with dairy cattle via tasks of their own choosing, such as grooming or milking the cows, taking care of calves, and mucking stalls (Pedersen et al., 2012). Over the study period, those in the intervention group (with cows) reported significant improvements in depression and self-efficacy, while those in the control group (without cows) reported no significant changes.

Another randomized controlled trial by members of the same research group examined the effects of a 12-week program in which adults with psychiatric disorders worked with farm animals – including cattle, sheep, horses, and small mammals – twice a week for three hours at a time (Berget et al., 2011). Each participant's exact work varied based on his or her coping ability and interests, and all had the opportunity to physically interact with the animals (Berget et al., 2011). The intervention (or AAI) group showed significantly lowered state anxiety (i.e., transient

anxiety in response to factors present in a specific moment, as measured by the Spielberger State Anxiety Inventory) and depression (as measured by the Beck Depression Inventory) at a six-month follow-up as compared to baseline measurements. In contrast, the control group, who received their standard psychiatric treatment only, showed no significant changes in state anxiety. Of note, there were no significant differences between study cohorts at follow-up in regard to depression, although both groups showed improvements in depression levels over time (Berget et al., 2011).

Other research has shown that people report valuing interactions with farm animals because the animals do not pressure, condemn, or stigmatize them (Granerud & Ericksson, 2014; Kogstad, Agdal, & Hopfenbeck, 2014). Moreover, farm animals often provide us with resources thought by many to be essential to human health, including milk and eggs, and are dependent on human care for their survival and well-being. This relationship can be particularly powerful for intervention participants who typically fill the role of care receiver, rather than providing care to other living beings (Gorman, 2019; Granerud & Ericksson, 2014; Kogstad et al., 2014). In addition to instilling empathy and respect for farm animals, this caregiving work can help break up monotonous routines when participants learn new tasks, or provide a stabilizing influence if participants are able to hone their skills through the same set of responsibilities (Kaley et al., 2019; Mallon, 1994; Steigen et al., 2016).



Animal-Assisted Interventions with Children and Youth in Farm Settings

Farm settings can provide a myriad of novel experiences for young people in both residential and day school settings. Routine interactions – such as milking a cow, feeding a llama, or caring for a

sheep during the shearing process – can be an important complement to the therapy and education a child or youth receives (Balleurka, Muela, Amiano, & Caldentey, 2014; Hassink et al., 2017; Mills et al., 2014; Pedersen et al., 2011). Qualitative research by Hassink and colleagues (2017) found that participating in farm AAIs can have the following effects for youth with behavioral challenges: (a) encouraging reciprocity of care, (b) instilling a sense of courage and self-efficacy when working with large farm animals, (c) supporting valued relationships with farm animals, (d) promoting relaxation and calm, and (e) offering helpful distraction from daily stressors or challenges. Moreover, interviews with study participants indicated that, while some youth had difficulties connecting with farm personnel, they chose to continue their work at the farm because they had established relationships with the animals and felt committed to their care and well-being (Hassink et al., 2017).

Often, the relationships youth form with farm animals are also therapeutic. In an early study at Green Chimneys, Mallon (1994) interviewed students and farm staff to explore their experiences regarding the inclusion of farm animals in treatment and therapeutic approaches. Mallon (1994) found that children interacted with farm animals in much the same way they did with a therapist (e.g., speaking to their favorite animals when feeling sad or angry). Moreover, 67% of students reported that they visited the farm when they needed to feel better, and 83% said they felt happy or excited when they were in the farm environment. One interviewed staff member speculated that forming safe relationships with farm animals could ultimately help students (re)connect with other humans, a widely-supported idea that continues to be posited in more recent studies (Gorman, 2019; Granerud & Ericksson, 2014; Hassink et al., 2017; Kogstad et al., 2014).

Mallon (1994, p. 466) also discussed how farm animals often serve as “compensatory attachment objects” with whom children can give and receive affection, nurturing, and a sense of connection. He argued that this form of attachment may be particularly meaningful for children living in residential treatment programs due to maltreatment, family violence, and other adverse

childhood experiences (Mallon, 1994). A recent study (Balleurka et al., 2014) measured the impact of animal-assisted therapy on attachment security among adolescents with behavior and depressive-anxiety disorders living in protective residential care ($n = 46$). Balleurka and colleagues (2014) assigned 21 youth to an animal-assisted therapy intervention group and 25 youth to a control group (standard therapy only); cohorts were formed based on the participants' adaptive difficulties to residential environments, as well as their similar mental health issues, national origin, and type of residential care program. All participating youth spent two consecutive days each week staying overnight at a farm and receiving group and individual therapy. For those in the intervention group, a dog and nine horses were incorporated as therapy animals. Likewise, guided interactions with farm animals, such as sheep, goats, chickens and pigs, were offered (Balleurka et al., 2014).

Researchers found that, over time, youth in the intervention group showed a significant increase in secure attachment (as measured by a reduced version of the CaMir Questionnaire), while those in the control group experienced no changes.



Practice Considerations

For some young people, forming relationships with farm (and other) animals may be easier and more comfortable than connecting with adult teachers, therapists, farmers, or other interventionists (Hassink et al., 2017; Pedersen et al., 2011). Indeed, much of the AAI literature highlights the ability of animals, particularly dogs, to enhance the therapeutic alliance between clients and helping professionals – a key component to positive client and/or student outcomes (Gorman, 2019; Parish-Plass & Pfeiffer, 2019). For example, by including an animal in mental health treatment, a therapist is able to model how the client will be treated in the therapeutic relationship by showing respect for the animal. This, in turn, (a) creates a sense of overall safety

and trust for the client; (b) enhances and expands the client’s notion of therapy and the therapeutic setting, particularly in outdoor or barn interactions with equines and other farm animals; and (c) allows the therapist to embark on a “joint venture” with the client by focusing on a collaborative task that can be done together (e.g., cleaning a lamb’s wool of debris) rather than directly talking about issues in a way that clients may find threatening (Ekholm Fry, 2019, p. 270; Gorman, 2019).

In nature-based settings like Green Chimneys, farm animals can enhance these early stages of an intervention by helping to build a trustworthy bridge between a student and the therapist, teacher, or Teaching Barn staff; by providing a motivating and supportive impetus for the student to engage in class or therapy; and by encouraging student self-awareness and responsible behavior through first listening to the Barn Caretaker and observing his or her interactions with animals before directly assisting with animal care (Pedersen et al., 2011). At the same time, Teaching Barn staff who facilitate educational animal-assisted activities must demonstrate a



The Teaching Barn provides opportunities for farm-focused AAAs, such as with its popular (and curious) sheep residents.

strong commitment to helping children and youth in need; be empathetic, patient, and flexible in their communication and teaching approach; maintain structure during planned activities; and be consistent in the tasks they ask students to perform (Berget et al., 2008a; Berget et al., 2008b; Ferwerdavan Zonnefeld, Oosting, & Kijlstra, 2012; Pedersen et al., 2011). At Green Chimneys, students are allowed regular physical contact with farm animals under the supervision of qualified and caring staff. With their guidance, interactions with farm animals at the Teaching Barn are thought to increase students’ confidence and abilities to cope with adversity.

Recently, there has been a growing call for researchers to measure the well-being effects of AAIs for farm and other animal participants (Coulter, 2016; Gorman, 2015; Hassink et al., 2017). Indeed, an environment or interaction may be simultaneously therapeutic for humans and distressing for animals (Gorman, 2015). As such, greater attention to the welfare and ethical treatment of animals, who often participate in this important work through no choice of their own, is needed. Currently, research regarding the impacts of AAIs for dogs and horses is growing, but is still lacking in regard to farm animal participants.

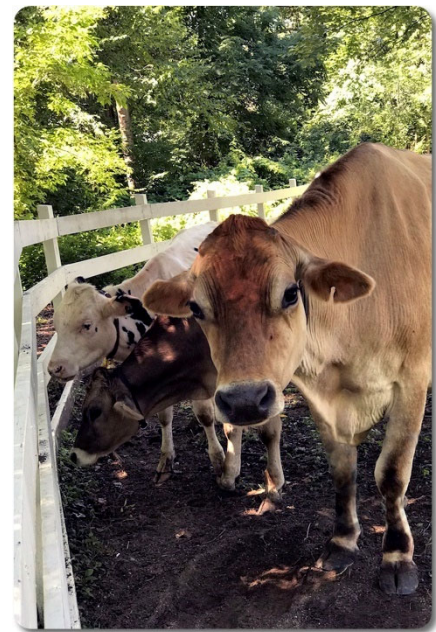
As a *starting point* towards supporting and ensuring farm animal well-being, farm professionals should work to maintain the Five Freedoms (see Table 3.7.1 in Chapter 3) and be knowledgeable and aware of animal behavior, including the species-specific and individual stress, affiliation, and calming signals among the animals they work with (Coulter, 2016; Gorman, 2015; Hassink et al., 2017). Depending on the species, animal and situation, general stress-related behaviors may include hanging their heads; avoiding human contact; being on high alert; and showing aggression, agitation, lack of appetite, and lethargy. Likewise, farm animal caretakers should be responsive to any signs of animal discomfort, pain, illness or maltreatment, and provide each animal with a safe and comfortable environment.

In addition, AAIs should ideally be designed around animals' natural and preferred behaviors (Stephan, 2015). For example, in pigs, this includes recognizing that most pigs are very social and like to be handled and massaged. They are also extremely intelligent and can become bored easily (Stephan, 2015). Therefore, AAIs with pigs could include taking them for walks, teaching them new tricks, and gently handling them. Of course, as with all animals, it is important to treat each pig as an individual with unique likes and dislikes. Pigs typically express positive emotions, such as relaxation and happiness, through sniffing, wagging their tails, and jumping or running. Conversely, they may communicate fear or stress through actions that include freezing or stiffening, as well as turning away or walking backwards (Stephan, 2015).

Like pigs, goats are herd animals, and typically should live with or in close proximity to at least one other goat. Goats are also active, playful, agile, and sociable with people. However, unlike pigs, goats usually do not seek out extensive physical contact or cuddling with humans, nor do they generally enjoy learning tricks (Stephan, 2015). However, because of their active nature, they can be appropriately engaged in AAIs that involve physical activity, including climbing, running, and going for walks. These two examples of pigs and goats demonstrate the diverse and complex needs of farm animal species, and the importance of being informed and connected to individual animals when including them in AAIs.

6.2 Overview of Teaching Barn Programs

The Teaching Barn at Green Chimneys offers diverse opportunities for students to foster positive connections with farm animals living onsite (Green Chimneys, 2019). First established in 1948, this program stemmed from the property's history as a working dairy farm and Dr. Ross' lifelong love of farm animals. In fact, milk from dairy cows was initially given to young Green Chimneys students for healthy nourishment. However, these cows were soon retired, as the staffing and time required to maintain an efficient milking schedule began to interfere with the responsibilities of running the school (Ross, 2011). This is, perhaps, also reflective of an overall shift in organizational focus from raising animals for consumption purposes to including them intentionally in educational and therapeutic interventions for children and youth.



Led by a transdisciplinary and specialized team of professionals, interns and volunteers, the Teaching Barn provides an engaging and experiential classroom where students are able to:

1. *Foster caring connections with farm animals, peers, adult mentors, members of the public, and the natural environment*
2. *Acquire practical, vocational, and leadership skills through activities that benefit Green Chimneys and the surrounding community*
3. *Apply scientific and other academic concepts in a natural setting*
4. *Gain confidence in their own growing knowledge and abilities*
5. *Develop fine and gross motor skills as they learn to navigate the barn environment*
6. *Practice mechanisms of coping, regulating their emotions, and controlling their behavior in times of stress and sensory overload*

6.3 General Policies, Practices, and Procedures

The Teaching Barn is generally accessible to Green Chimneys staff and supervised students during regular business hours throughout the week, with extended hours offered to accommodate AAI sessions before or after school and on the weekends (M. Kinoshita, personal communication, July 25, 2017). As is true across the Green Chimneys campus, policies, practices, and procedures at the Teaching Barn emphasize the safety and well-being of both human and non-human animals. If any AAI participant appears uncomfortable or expresses discomfort with a certain therapeutic or educational activity, staff members are trained to promptly pause or conclude the session and thoroughly assess the situation for any welfare concerns.

Generally, students and visitors are asked to keep their hands out of animal enclosures in the Teaching Barn, and are not allowed to feed farm animals without staff supervision. In the case of a weather emergency that prevents full-time caretaking staff from coming to campus, detailed feeding instructions for each resident animal are posted near the food bins so that interns, who are housed adjacent to campus, are able to fill in. Additionally, students and visitors are not permitted to run or yell throughout the barn, and must ask for permission prior to opening any animal enclosure. Overall, these rules and procedures instill a greater sense of responsibility among students for ensuring animal well-being, and encourage them to become conscientious stewards of animal safety.

Additionally, the farm staff provide hands-on training to teachers and clinical staff who wish to include animals in their work with students. Training emphasizes essential animal handling and care skills, such as harnessing, leading, grooming, communicating or using specific commands, and understanding each animal's behavioral signs of stress or affiliation (M. Kinoshita, personal communication, July 25, 2017). Prior to beginning any farm AAI, teaching and clinical staff work collaboratively with the Farm Education Program Manager (see description below) to determine which animals may be most appropriate given the participating student's interests, abilities and education/treatment goals, as well as the animal's preferences and temperament.



Interns and students arriving at the Teaching Barn for morning Learn and Earns are greeted by this friendly Alpine goat and his wagging tail.

Typically, a member of the Teaching Barn staff or an intern will partner with the teacher or social worker for the first few sessions with a student to provide additional support and species-specific expertise (also known as the “diamond model”; Zilcha-Mano, Mikulincer, & Shaver, 2011). In this model, the animal handler or specialist focuses on the animal's needs during the intervention, while the teacher/therapist and student engage in the interaction itself. This structure allows the Teaching Barn staff to ensure animal well-being so that the teacher or therapist can focus on the student while he or she becomes more familiar with the Teaching Barn setting. As the teacher or therapist gains comfort with the barn and the animals who reside there, the Teaching Barn staff member (e.g., the Farm Education Program Manager) may step away from sessions; this “triangle model” of interventionist, student, and animal (Zilcha-Mano et al., 2011) can be advantageous as it allows for more privacy and fewer distractions during the session.

6.4 Staffing

Farm Education Program Manager – This individual leads Green Chimneys’ nature-based internship program and collaborates with school staff to connect traditional classroom curricula with the academic and CTE activities offered through the Teaching Barn’s Learn and Earn program. Individualized Learn and Earn and mentorship objectives are identified for each participating student through staff discussions on his or her potential areas for growth related to classroom behavior and social skills, including the ability to form and maintain healthy boundaries with others. As a part of this process, the Farm Education Program Manager schedules all Learn and Earn farm activities for students, interns, and supporting volunteers.

Moreover, this individual assists the school administrative team and Farm and Wildlife Director (see Section 3.4 in Chapter 3) in the development and broad integration of nature-based therapies and activities into other program areas across the Green Chimneys campus. In addition to having practical experience working on farms and/or in educational settings including a diverse range of farm animal species, the Farm Education Program Manager must have a solid understanding of humane education and its facilitation. This individual reports to (and, when needed, stands-in for) the Farm and Wildlife Director.

Farm Program Manager/4-H Program Coordinator – The Farm Program Manager/4-H Program Coordinator performs and oversees functions related to nature-based program development, as well as the supervision and management of Teaching Barn staff. Together with the Farm and Wildlife Director and Farm Education Program Manager, the Farm Program Manager/4-H Program Coordinator implements the unique philosophy of animal care in Green Chimneys’ therapeutic, non-production agricultural setting; represents the farm at administrative rounds in rotation; and contributes to the day-to-day scheduling of farm staff based on evolving program needs.

Other key responsibilities include: (a) providing supportive oversight regarding the daily management of barns, sheds, pastures, fields, and organic gardens; (b) collaborating with other Green Chimneys Managers on the care of equines and wildlife; (c) broadly supporting the Green Chimneys administration, school, and social services departments; (d) serving as Green Chimneys' primary liaison for veterinarians, sheep shearers, vendors, and other specialists; (e) maintaining Green Chimneys' United States Department of Agriculture (USDA) C license through the careful management of animal medical records; (f) ensuring the accessibility of the farm for youth, families, staff, interns, volunteers, and the general public; (g) supervising staff in their delivery of public farm tours; and (h) assisting with farm special events and the activities of the Boni-Bel Country Store. In addition, the Farm Program Manager/4-H Program Coordinator oversees all 4-H programming, ensuring that curriculum, activities, and preparations for the Putnam County 4-H Fair contribute to the PYD of all students at Green Chimneys. This position reports to the Farm and Wildlife Director.

Program Assistant and Farm Animal/Barn Caretaker – This individual oversees the health and well-being of all animals living at the Teaching Barn, and is responsible for pasture upkeep and the daily supervision of 2-3 interns and 1-2 volunteers. He or she also manages the preventive, emergency, and long-term medical needs of the resident farm animals by working closely with local veterinarians, farriers, sheep shearers, and other species specialists. In accordance with best practices and to maintain Green Chimneys' Class C USDA license, the Program Assistant and Farm Animal/Barn Caretaker systematizes the medical histories and notes of all farm animals for potential review during annual, impromptu inspections by the USDA. This individual holds a bachelor's



degree in animal science or agriculture, with extensive practical experience working with farm animals, and reports to the Farm Program Manager/4-H Program Coordinator and the Farm and Wildlife Director.

Farm/Canine Program Assistant – The Farm/Canine Program Assistant is responsible for supporting all aspects of Green Chimneys’ Teaching Barn programming, such as maintaining the health and accessibility of the farm grounds, contributing to animal care and barn management, mentoring students through Learn and Earn activities, developing after-school and weekend programs at the Teaching Barn, and assisting with special community events. As needed, this individual also assists with other program areas across campus, including the Canine Program (see Chapter 7) and Recreation Department (see Chapter 11). Preferably, the Farm/Canine Program Assistant holds a bachelor’s degree in animal science or a related field, and has prior experience working in a farm setting. This person reports to the Farm Program Manager/4-H Program Coordinator, and the Farm and Wildlife Director.

Farm Science Teacher – The Farm Science Teacher is responsible for developing curricula in humane education and farm science (a component of 4-H) – as well as farm animal history, behavior, and training – for classes that typically consist of six students in 1st through 12th grade. This person works with a designated classroom teaching assistant (TA), and uses individualized education program (IEP) goals and supporting information to create and adapt lesson plans according to the needs and strengths of each student. Likewise, he or she assists with supporting the health, safety and welfare of all animals who live at the Teaching Barn, and fills in for the Farm/Canine Program Assistant when needed. Additional responsibilities include the care of all small animals who live in the farm science classroom, including doves, guinea pigs, rats, and parakeets.



Recently, the Farm Science Teacher partnered with a Creative Arts Therapist to provide a specialized after-school group in which students designed and built a moveable maze as enrichment for classroom rats.

The Farm Science Teacher holds a master's degree in either education or special education and has a valid teaching license or certificate in the state of New York. Although this individual does not provide data to inform IEP goals, he or she submits quarterly report cards with grades based on each student's classroom behavior (including degree of safety), participation in class

discussions and activities, use of social skills, and overall effort. Moreover, the Farm Science Teacher must have an active interest in working with farm animals; a basic understanding of human-animal interaction (HAI) theory and practice; and a willingness to participate in orientation, as well as initial and/or ongoing AAI training, provided by Green Chimneys. The Farm Science Teacher reports to the Farm and Wildlife Director and is accountable to the Farm Education Program Manager and the general supervisor for classroom teachers in the school program.

Teaching Barn Interns – Interns at the Teaching Barn work closely with students to help foster animal care skills and positive self-regard through ongoing mentoring. Their primary responsibility is to ensure human and animal safety while helping students complete daily Learn and Earn activities. Other than having an interest in working with farm animals and Green Chimneys' student population, prospective Teaching Barn Interns must be at least three years post-high school graduation and participate in a screening and interview process; experience with farm animals is not a strict prerequisite. Prior to working with students or animals, interns receive training from the Farm Education Program Manager and the Program Assistant and Farm Animal/Barn Caretaker on the Teaching Barn facility and equipment; the program's

policies, practices, and procedures; how to handle and care for the resident farm animals; and how to observe, monitor, and verbally de-escalate students when needed. Additionally, interns thoroughly review their students' relevant psychological histories, and briefly meet with each students' social worker, as part of this initial training process and whenever a new student is added to their caseload.



A group of Teaching Barn Interns receive training on how to clean and feed llamas, skills they will eventually teach to students through Learn and Earn activities.

Internships at the Teaching Barn typically last four to eight months. Each intern mentors between 16 and 21 students, working with each student once or twice a week on such caretaking tasks as mucking stalls, preparing feed, or taking animals to pasture. Interns also work closely with the Farm Education Program Manager to determine which Learn and Earn activities [with which animal(s)] best

align with each student's current treatment and/or educational goals. At the end of every month, interns review their students' competencies, achievements, and/or setbacks with the Farm Education Program Manager to assess progress and whether any changes in approach are needed.

Teaching Barn Volunteers – Volunteers interested in working at the Teaching Barn must receive extensive training in farm animal care and handling from the Program Assistant and Farm Animal/Barn Caretaker. Each volunteer works closely with the Farm Animal/Barn Caretaker until he or she is comfortable enough to work independently. Overall, 10 committed volunteers currently work at the Teaching Barn, with up to 2 onsite at one time to assist with daily tasks. Volunteer assignments at the Teaching Barn are based on the experience level of the individual,

and can range from cleaning stalls to advanced animal handling (e.g., transferring large animals in and out of pens).

6.5 Facilities and Tangible Resources

The Teaching Barn is located between the Horse Barn, the Wildlife Center, and the school on the northeast side of the Green Chimneys campus (see *Green Chimneys Campus Map* on page 10).

The main indoor facility contains nine box stalls divided into two rows. Additionally, the Teaching Barn classroom and office share an adjacent space on the north side of the building, along with a room for small animal quarantine.

Immediately outside of the barn structure are four turnout areas attached to the east and west sides of the building; these are uncovered and contained by wood panel fencing. In addition, a series of free-range habitats and coops for chickens are situated along the northwest and northeast sides of



the Teaching Barn, while rabbits reside in the southwest corner. Due south of the main facility is a shed-like structure divided into three stalls, each with its own separate turnout paddock for pigs. The larger pigs have an additional muddy paddock east of the main barn facility, which is adjacent to the cow pasture. One of the two younger flocks of sheep graze in a turnout pasture between the Wildlife Center and the Horse Barn, with the second flock and some llamas often residing in a pasture on the southside of campus between the canine kennel facilities, the Educational Garden, and the student residences (see *Green Chimneys Campus Map* on page 10). The primary tools and equipment used by Teaching Barn staff, interns, and/or students include a tractor, wheelbarrows, pitchforks, rakes, shovels, and hoof trimmers.

6.6 Animals at the Teaching Barn



Teaching Barn staff carefully assess each animal's temperament, health status, and level of stress before including him or her in an AAI session or activity with a student. While all animals at the Teaching Barn may play a role in AAIs, it is not always appropriate or safe for students to interact directly with every animal. For example, because of their size and unpredictable temperament, the two large-breed pigs are primarily cared for and handled by qualified staff members, interns and specifically trained volunteers, while students may help prepare their food, clean their paddocks, or participate in other indirect care activities.

6.7 Considerations for the Humane Care of Animals

Given the relative diversity and large number of animals residing at the Teaching Barn, staff must be conscientious, collaborative, and highly organized to ensure that multiple species-specific and individual animal needs are met simultaneously. Much like other program areas at Green Chimneys, the Five Freedoms and an overall commitment to animal wellness help guide the humane care and ethical treatment of animals at the Teaching Barn.

The Five Freedoms at the Teaching Barn

Freedom from thirst and hunger – All farm animals who live at the Teaching Barn are provided constant access to fresh water, unless they are participating in Farm Science Classes, therapy sessions, or other AAIs in a location away from their pen or enclosure. In such cases, staff ensure that young animals,



who might be particularly vulnerable to stress from these sessions, participate in only one AAI session at a time. These sessions typically last about 30 minutes each, and water is always made readily available immediately before and after each AAI session. Staff ensure freedom from hunger by feeding farm animals predetermined amounts in their stalls twice per day, and allowing them to graze and free feed when turned out to the surrounding pastures. Depending upon the species, animals at the Teaching Barn are fed a diet of local hay, grass and/or species-specific feed, which is supplemented by fruits and vegetables from the school gardens and dining hall. While animals often receive positive reinforcement in the form of food when engaging with humans, Teaching Barn staff carefully attend to each animal's body condition and make adjustments to his or her nutritional regimen as needed.

Freedom from discomfort – Staff at the Teaching Barn provide animals with physical comfort through ample living space, species-specific amenities (e.g., pig beds have insulation underneath and heat lamps above them), and shelter from extreme or inclement weather. For example, if a goat falls ill, he or she is housed in a separate stall in the barn with a heat lamp and miniature horse blanket for warmth while receiving necessary medical treatment. In addition, stalls are thoroughly mucked out on a daily basis, with fresh straw and other natural bedding materials replaced each morning. Every spring, a professional sheep shearer gently shears sheep to prevent them from becoming dirty and overheated in the summer months. Moreover, all farm animals who participate in therapeutic or educational interventions are monitored closely for behavioral signs of discomfort and are removed from the situation if the Teaching Barn staff or interventionist deems necessary.



Freedom from pain, injury, and disease – Teaching Barn staff make every effort to prevent and/or minimize pain, injury, and disease among farm animals through regular veterinary examinations and emergency care. As needed, the Program Assistant and Farm Animal/Barn Caretaker will administer subcutaneous and intramuscular vaccines and medication to the resident animals. In addition, a local farrier visits Green Chimneys routinely to provide cows with vital rehabilitative hoof care and trimming. Of note, Green Chimneys' General Animal Caretaker (see Section 5.4 in Chapter 5) and Teaching Barn staff provide similar hoof care to pigs, llamas, goats, and sheep. Teaching Barn staff also assess each farm animal on a daily basis for any wounds, lameness or other signs of physical pain or illness, and seek medical attention whenever necessary.

Freedom to express normal behaviors – On the whole, farm animals at Green Chimneys are given the freedom to express behaviors that align with their species-specific and individual needs and propensities. During AAIs, students are asked to be calm and respectful in their approach so that participating animals can feel safe and are free to behave naturally. Additionally, Teaching Barn staff continuously attend to each animal’s unique behavioral needs regarding housing, feeding, movement, physical activity, and socialization. For example, one of the pens for the Teaching Barn’s two largest pigs is more spacious than the other, allowing for greater freedom of movement. In order to ensure that each pig has equal time in the larger pen, staff move them back and forth between enclosures every other week. Additionally, a goat resides with one of the pigs, as she does not get along socially with other goats and is much calmer when housed with this particular pig. These are just two ways that the Teaching Barn staff respects the freedom of these animals to behave normally by making necessary adjustments to their habitats, routines, and/or stall mates.



Freedom from fear and distress – By supervising the interactions that students and visitors have with farm animals, Teaching Barn staff, interns, and volunteers seek to prevent animal fear and distress. Each time a student transitions to the Teaching Barn, his or her teacher or social worker informs Teaching Barn staff if the student is experiencing any significant behavioral or emotional issues. Before interacting with the farm animals, students must first be able to demonstrate safe, calm, and respectful behavior (see General Policies, Practices, and Procedures in Section 6.3). If a student is having difficulty self-regulating at the Teaching Barn, a qualified staff member may remove him or her from the environment and apply appropriate, student-specific de-escalation strategies from the Therapeutic Crisis Intervention model. As discussed previously, staff

continually monitor farm animals for behavioral signs of fear, distress and discomfort, especially during their active participation in AAIs.

Veterinary Care

Green Chimneys provides animals at the Teaching Barn with lifelong care, including regular veterinary treatment; preventive and maintenance health checks performed by trained and qualified staff (e.g., the Program Assistant and Farm Animal/Barn Caretaker); and a nutrient-



Through Farm Science curricula, students learn about potential dangers to farm animals, such as poisonous plants, and what symptoms might indicate an animal is in need of medical attention.

rich, species-specific diet tailored to each animal's nutritional needs (Green Chimneys, 2019). A large animal veterinarian is typically onsite at least once each month to weigh the animals, administer deworming medication, and/or provide annual vaccinations, such as rabies and *Clostridium perfringens*. Additionally, Green Chimneys adheres to the USDA's *Animal care: Program of veterinary care* (USDA APHIS, 2018), which requires attending veterinarians and Teaching Barn staff to develop a written program that ensures adequate care for all animals on the premises, including disease control and prevention, pre- and post-procedural care, nutrition, and euthanasia.

If a farm animal is unwell, Teaching Barn staff work with a veterinarian to decide if euthanasia is the best course of action. Important considerations include (a) whether the animal is in pain; (b) the age and overall health of the animal; (c) the animal's current and future quality of life; (d) the cost, methods, and potential outcomes of treatment; and (e) the impact on the students. If the choice is made to euthanize the animal, Teaching Barn staff strive to make the animal comfortable, invite colleagues to be present during the procedure, and ask the veterinarian to come at a quiet time of day. While staff do not make campus-wide announcements of euthanasia

procedures (see Section 5.3 in Chapter 5), the Farm Education Program Manager notifies Green Chimneys leadership of the decision and works closely with clinicians to identify children who may need extra care or attention when grieving the death of the animal (Kinoshita, 2015).

Prior to welcoming a new farm animal to the Teaching Barn, staff first consider the animal's species/breed and size, behavior, temperament, and housing and feeding needs. Likewise, the team reviews the animal's veterinary history and medical records in order to optimize his or her care, as well as safeguard other animals of the same species who may be housed with or near the incoming animal. Screening is stringent due to the Teaching Barn's limited capacity to provide a separate quarantine area for medium to large livestock, should the need arise; currently, only chickens, ducks, and other small animals can be kept at the Teaching Barn for quarantine. The Farm Animal Barn Caretaker completes a USDA Record Form for every farm animal resident upon his or her arrival to Green Chimneys, and updates the animal's medical record to reflect the move and all other USDA requirements. Likewise, Green Chimneys' medical record files for farm animals follow the USDA guidelines of the aforementioned *Animal care: Program of veterinary care* (USDA APHIS, 2018).

6.8 The Teaching Barn as a Context for Positive Youth Development

One of the clear benefits of working and learning at the Teaching Barn is the diversity of novel and engaging experiences it offers children and youth. For many students, such experiences may be both challenging and a source of solace, thereby promoting their SEL and PYD.

The *Big Three* at the Teaching Barn

Positive and sustained relationships between youth and adults – Teaching Barn staff and interns foster a wide range of positive growth experiences for children and youth at Green Chimneys. For example, prescheduled visits from the community on Saturdays offer students and Teaching

Barn staff opportunities to co-lead informative tours of the barn and animal habitats (Green Chimneys, 2019). Students who demonstrate responsible behavior, express an interest in guiding supervised tours, and practice beforehand with supportive adult mentors are given these unique and valuable learning opportunities.



Additionally, farm animals often serve as important social catalysts between students and adults. One intern recently described a student who was resistant to going with her to the Teaching Barn, but became noticeably calmer once he arrived and began petting the goats. The intern then used her knowledge of the student's fondness for Harry Potter, and soon they were both riding on their broomsticks on their way to clean the chicken coop and planning a wand-making session during their next Learn and Earn (T. Zapalac, personal communication, March 27, 2019). Enjoyable exercises such as these build self-awareness, emotional regulation and communication skills, confidence, responsible caregiving, and trusting relationships between students and engaged adults.

Activities that build important life skills – Green Chimneys students develop essential life skills at the Teaching Barn by participating in a variety of animal-assisted activities and barn chores, as well as special community events. For example, during Little Folk Farm Day, students develop interpersonal, social, and leadership skills by speaking with attendees and sharing their knowledge; selling tickets and snack items; and helping co-lead Teaching Barn and campus tours. While students are given the opportunity to shine during these events, it should be noted that each of these activities are supervised by a Green Chimneys staff member, which helps optimize

student learning and ensures the proper execution of tasks (M. Kinoshita, personal communication, July 25, 2017).

Opportunities for youth to use life skills as participants in, and leaders of, valued community activities – Working with large and somewhat unfamiliar animals at the Teaching Barn instills valuable knowledge, useful animal handling and care skills, and positive self-regard among Green Chimneys students. These benefits, combined with the social and leadership skills students gain through guiding barn tours and speaking with visitors, are important for both PYD and community engagement. Furthermore, students who dedicate their time to becoming familiar with a particular farm animal or animal species often participate in 4-H Showmanship at the annual Putnam County Fair (see Section 6.9 for more information). This time-honored community event highlights youth leadership, knowledge, animal handling, and communication skills (Green Chimneys, 2013).



The *Five Cs* of PYD at the Teaching Barn

Competence – Including animals in educational and therapeutic activities often leads to an increased sense of *competence* for students who may be insecure about their abilities or unaware of their existing and growing strengths. At the Teaching Barn, the Farm Science Teacher, Program Assistant and Farm Animal/Barn Caretaker, and General Animal Caretaker build competence among students by providing them with practical lessons in farm animal husbandry, behavior, health, habitats, and overall care. Moreover, students who are interested in participating in 4-H programming practice how to handle a wide variety of farm animal species, each of whom present with unique needs and personalities. In order to be a calm, self-aware and

competent handler, young 4-H participants also learn the importance of regulating their emotions and keeping their body composed, as most animals tend to startle in response to sudden movements or loud noises. Eventually, experienced students may be chosen to present at the 4-H County Fair, which requires they be competent in handling the animal and in describing his or her species-specific and individual traits to members of the public.



Connection – For students at Green Chimneys, making connections with others might feel difficult or unnerving, at least initially. New students are transferred out of their district school and, in the case of residential students, separated from their families and friends. Over time, however,

most students experience Green Chimneys as a supportive refuge. The abundant green landscapes, large variety of animal species and programs, and diverse opportunities for outdoor recreation in the natural, farm environment make the Teaching Barn an ideal setting for building connections. At the Teaching Barn, students foster *connection* through meaningful relationships with individual farm animals, such as interacting gently with Samantha, a Jersey Cow; helping to provide nourishment to Copper, a Tamworth Pig; handling and learning about rabbits, like Cinnamon and Dandelion, during 4-H activities; and experiencing progress with Bo Peep during animal-assisted therapy sessions with sheep. Likewise, students connect with their social worker during shared animal bonding, fellow peers and intern mentors during Learn and Earn tasks, teachers and TAs during Farm Science Class, and members of the community during Teaching Barn tours and site visits.

In addition, individual therapy sessions or classes that incorporate a farm animal from the Teaching Barn allow students to make conceptual connections between the animal's story or behavior and their own. For example, when the Farm Science Teacher recently asked students to share a connection they had with an animal, two out of three students were able to make a connection between their behaviors and experiences and an animal they knew (J. Colacicco, personal communication, March 20, 2017). Students who struggle with transitions may feel particularly connected with a goat showing signs of stress upon first arrival to the Teaching Barn environment. Likewise, children who are just learning how to regulate their emotions during times of frustration may see themselves in a pig with similar behavioral issues.

Confidence – A popular Learn and Earn activity among students at the Teaching Barn is caring for the chickens in their coop enclosure. Although many students are initially intimidated by working in such close proximity to the chickens, they often learn how to navigate the coop environment and interact confidently with its inhabitants through observation and guidance from staff. This job requires that students be mindful in their movements and observant of animal behavior and location, especially given the likelihood of hungry chickens being underfoot. Likewise, students learn to carefully approach the nest box to collect any freshly laid eggs. Overcoming trepidation and gaining useful skills, whether in the chicken coop or in another farm animal enclosure, builds a student's *confidence* and sense of self-efficacy.



Character – Positive, sustained relationships between a student and a Teaching Barn staff member or intern can have a formative impact on the student's *character* development. For

example, when engaging in a Learn and Earn task at the Teaching Barn, students must listen and be respectful to the intern when learning new concepts, especially as they relate to interacting safely and gently with resident farm animals. Students must also demonstrate that they value this important work by being on time, responding with interest to the intern's directions and prompts, and showing a strong commitment to completing each task they have been assigned. In turn, the intern helps strengthen and reinforce the student's development in this area through support, commendation, and encouragement. In rare cases (e.g., when the student is not following instructions, or is engaging in unsafe behaviors while in the barn), the treatment team may determine that the student's participation in the Learn and Earn program should be suspended until he or she is able to meet expectations.

Caring – The conscientious and species-specific care of farm animals living at the Teaching Barn is a common Learn and Earn responsibility at Green Chimneys. In this role, students take part in such animal care tasks as providing food and water to goats and llamas; helping shear sheep and prepare them for warmer weather; cleaning pig pens and paddocks; leading cows to pasture; and facilitating outdoor time for rabbits in their designated turnout areas. Likewise, students are reminded of the potential impact their behavior may have on the well-being of others, and how remaining calm and composed in the barn is a form of *caring*. Overall, the compassion that students show farm animals is intended to translate into increased empathy towards others, including farm animals raised inhumanely in other environments for food production purposes; greater self-care; and the development of community building skills through working collaboratively with peers and adult mentors.

6.9 Animal-Assisted Interventions at the Teaching Barn

Given the diversity of species living at the Teaching Barn, students have the opportunity to engage with farm animals in AAIs tailored to their individual academic and therapeutic goals.

Below are descriptions of animal-assisted therapies, activities, and educational interventions that students may participate in at the Teaching Barn.

Animal-Assisted Therapy at the Teaching Barn

Farm animal-assisted therapy – The Teaching Barn provides an ideal setting for social workers to support individual youth through a variety of clinical interventions with different animal species. Social workers may choose to hold a session with a single student while partnering with an animal (i.e., via the triangle model), or coordinate with a Teaching Barn staff member or intern. In the latter scenario, the specialized staff member or intern leads the student and animal through a farming activity, with the social worker making appropriate connections to his or her treatment goals (i.e., via the diamond model).



Students often feel connected with the farm animals at Green Chimneys through a sense of shared experience. For example, a student struggling with loneliness may be particularly drawn to a hen who appears isolated or separate from the brood. In response, the social worker may encourage the student to provide the animal with empathic, compassionate care during animal-assisted therapy, which, in turn, could foster a much needed friendship for the child and help him or her process personal feelings of depression, abandonment, and rejection. Additionally, youth who witness improved physical wellness among the farm animals they have cared for may begin to see the potential for positive growth in themselves. This can prompt students, however subtly, to recognize the value of their contributions, stay engaged with a challenging or prolonged task, and care for themselves in the same gentle and intentional ways they do with an

injured cow or highly anxious llama. Overall, social workers utilize these and many other points of human-animal connection to help clients actualize their unique therapeutic goals.

Due to their gentle and approachable nature, sheep are commonly included in animal-assisted therapy sessions at Green Chimneys. Led by a licensed social worker, individual animal-assisted therapy with sheep in the Teaching Barn environment involves two central phases. The first phase focuses on creating social-emotional goals for the student via observing a sheep move about freely in his or her habitat. During these sessions, the therapist and client typically bring chairs into the sheep's stall and discuss the sheep's behaviors and movements; the social worker often highlights instances when the sheep chooses to either directly interact with them or stay at a distance. The primary therapeutic goals in this largely experiential learning phase include teaching the student about respecting the boundaries and space of another living being through observing and responding to the sheep's behavioral communication and any indicators of stress or affiliation. Likewise, students are encouraged to be mindful of how the sheep is responding to them, and to adapt their behavior as needed to ensure a calm and safe environment for everyone.

In the second phase, students learn the process of walking with the sheep around the Green Chimneys campus, which includes careful planning and respectful animal handling and leading skills. This more physically active intervention also fosters self-awareness and responsibility for the student, and may even ease communication with the social worker as he or she builds connection with the sheep and the surrounding environment. According to the Farm Education Program Manager, some students are more communicative and "responsive when [they are] physically moving" (M. Kinoshita, personal communication, July 25, 2017).



The first phase of individual animal-assisted therapy with sheep (pictured on the left) is often about observing the sheep's behavior and establishing respect for the sheep's boundaries. The second phase, pictured on the right, involves walking with the sheep around campus. This task fosters a student's responsibility, self-awareness, communication, and social skills as he or she develops a deeper connection with the sheep.

Notably, young sheep have also taken part in specific therapeutic interventions, such as support groups for children with adoption histories. According to Kaufmann, Kinoshita, and Teumer (2019),

... [these children] bottle fed and helped raise orphaned lambs as part of their weekly adoptee support group. Guided by social workers, they processed their own experience as orphans, while also providing nurturance to young animals who had lost their families through separation (pp. 256-257).

Therapy sessions with sheep or other farm animals can fulfill or contribute to the required mental health service time allotment identified on each student's IEP. Therapists and students meet for individual animal-assisted therapy sessions once a week for 45 minutes over an average period of 8 to 10 weeks, although sessions are ultimately dependent on the availability and health of the animal, the student's desire to work with a particular species that day, and the weather. Following each session, the therapist documents any therapeutic progress or setbacks in his or her clinical notes for that student.

Animal-Assisted Activities at the Teaching Barn

Open Pen – “Open Pen” activities allow youth to interact freely with certain farm animals, either directly or indirectly, in a designated pen or stall without the assistance of Teaching Barn staff. However, students who wish to participate in Open Pen activities must do so with a teacher, social worker, or intern who provides support and ensures human and animal safety. Activities often include observing and grooming the farm animals, as well as walking with animals around the periphery of the pen. Because activities are less formalized during Open Pen time, students often connect with animals in a relatively natural and genuine way. While Teaching Barn staff involvement is not required during these interactions, these staff members oversee the selection of an appropriate and safe animal species or individual animal to participate. Again, the docile and gentle nature of many of the sheep at Green Chimneys is conducive to the less structured quality of Open Pen activities.



Animal Club – Green Chimneys’ Animal Club gives students an opportunity to spend quality time with farm animals of their own choosing outside of regular school hours. This strengths-based activity is led by Teaching Barn personnel (i.e., the Farm/Canine Program Assistant and/or an intern), with additional support from residential life staff as needed. If a student’s behavior becomes unsafe, disruptive or distracting during club activities, Residential Counselors help him or her de-escalate or find an alternative activity away from the Teaching Barn. Specific prohibited behaviors include, but are not limited to: (a) fast or riotous movements in the presence of an animal; (b) purposefully trying to cause an animal distress; (c) hitting, punching, or otherwise physically harming an animal; (d) throwing objects at, or in the vicinity of, an animal; and (e)

running away from an animal. Depending upon the severity of the situation, a student who displays any of these five behaviors will either be redirected or removed from the Teaching Barn setting.

The Animal Club can host four to six students at a time, and takes place for one hour Monday through Thursday in the afternoons following school. If a student has expressed interest in joining the club, but has demonstrated fear of a certain species, staff



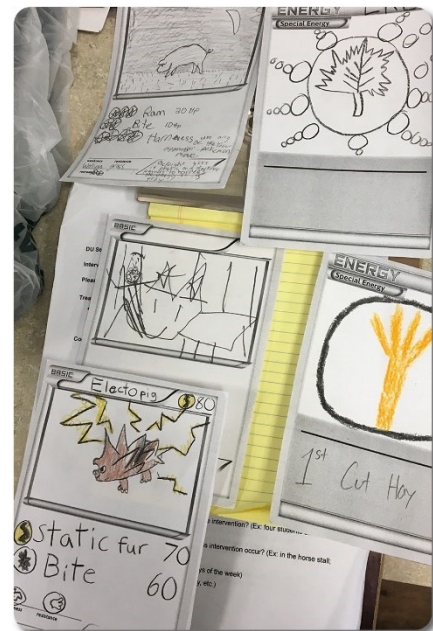
will help the student learn about that animal, assist with the student's gradual introduction to the animal, and teach the student how to interact with the animal safely and confidently. Animal-assisted activities in the Animal Club expand upon and support what students are learning in school, therapy, Learn and Earns, and other program areas. For example, the Farm/Canine Program Assistant may help students in the Animal Club build emotional regulation skills, as well as boundary and body awareness by asking them to allow a Potbelly pig to approach them. In this scenario, students can also walk towards the pig, but cannot corner or crowd him. Likewise, if students wish to physically connect with the pig, they must first extend their hands and allow him the freedom to decide whether he wants to interact with them. Overall, these enjoyable activities at the Teaching Barn and farm science classroom complement a student's treatment and learning in an interactive, social environment.

Evening Teaching Barn Program – Residential students may participate in evening visits at the Teaching Barn three nights per week; 45-minute visits are offered from 6-6:45pm and again from 7-7:45pm. One entire dorm consisting of up to eight students and two residential life staff may be accommodated at one time. In order to support diverse student interests and to avoid inundating

the Teaching Barn, Green Chimneys offers evening visits in other program areas as well (e.g., the Horse Barn). Evening Teaching Barn activities are held after the farm animals have been fed and brought in from their outdoor pens and turnout areas. The Farm/Canine Program Assistant is responsible for developing and facilitating activities to foster student interests in farm animals and barn environments, such as creating superhero cards featuring a favorite resident animal to encourage learning about his or her behavior and habitat needs. This enrichment programming is casual and not oriented toward meeting specific academic or treatment goals.

Animal-Assisted Education at the Teaching Barn

Farm Science Class – The Farm Science Class at Green Chimneys offers adapted and supplementary animal science curricula through instruction by a certified educator (i.e., the Farm Science Teacher), a general classroom TA, and the Farm/Canine Program Assistant or a Teaching Barn Intern. All students participate in the Farm Science Class, which is considered a “special program” opportunity akin to art class or physical education (PE). Classes occur on a weekly basis for 37 minutes and cover such topics as advanced animal and species-specific handling skills, animal life sciences, the binomial nomenclature or scientific names of farm animals, agricultural and environmental awareness, and public speaking (Green Chimneys, 2019). As noted earlier, the Farm Science Teacher submits a quarterly report card grade for each participating student, but does not write his or her IEP goals or collect other metrics pertaining to student performance.



In Farm Science Class, students learn agricultural and biological concepts, such as how pigs turn hay into energy.

The Farm Science curriculum is flexible enough to accommodate the behavioral and educational needs of individual youth (J. Colacicco, personal communication, March 21, 2017). For example, in a former 5th grade class at Green Chimneys, the Farm Science Teacher adapted core curriculum standards for living environment sciences (University of the State of New York, Regents of the University Core Curriculum, n.d.) by teaching basic poultry anatomy and husbandry, and making relational connections between fowl and classroom doves; of note, these standards have since been revised and updated. The Farm Science Teacher also modified the 4-H curriculum on poultry handling skills (National 4-H Council, 2003) to meet the educational needs of these 5th graders, explaining that once dove handling skills were met, the class could work toward handling the chickens at the Teaching Barn and/or Boni-Bel Farm.



Likewise, the Farm Science Teacher may modify lesson plans based on the level of classroom engagement among students, and works closely with a TA who provides helpful information on each student's behavior and current level of sensory integration prior to class. This helps the teacher prepare any necessary accommodations for students (e.g., designated time to relax before joining an educational activity), and supports both human and animal safety. Before transitioning to the Farm Science Class from another activity or setting on campus, students are asked to self-reflect on whether they believe they are ready and able to behave safely, and are reminded to use their individual self-regulating and coping skills whenever needed. As in other program areas, students must always abide by classroom safety rules, such as refraining from yelling or opening enclosures without adult permission, during Farm Science Class and/or at the Teaching Barn.

4-H Club Programming – For many students, 4-H Club Programming at Green Chimneys is an instrumental component of their animal-assisted education. Since 1971, youth have attended the annual Putnam County 4-H Fair (sponsored by the local 4-H affiliate, Cornell Cooperative Extension), and have earned awards for their exceptional animal handling and presenting skills (Cornell Cooperative Extension, 2019). The Farm Program Manager/4-H Program Coordinator and General Animal Caretaker lead the 4-H programming, which primarily includes teaching students about animal breed origins, animal reproductive processes, basic animal anatomy and caretaking, and showmanship skills. Teaching Barn staff work together to select which farm animals may be included in the program and with which student they should be paired. Careful planning and preparation for this annual summer exposition is important, as it allows students adequate time to get to know the animal they have been paired with, to work towards their individual 4-H goals, and to practice confident handling and public speaking skills (Green Chimneys, 2019).



At Green Chimneys, early 4-H activities for children under the age of 12 years include handling and presenting small animals (e.g., doves, rabbits, chickens, and guinea pigs) to fellow students and adults on campus. In contrast, students 12 years of age and older are typically partnered with larger livestock animals (e.g., pigs, llamas, goats, sheep, and cows), and work towards honing their presentation skills to showcase the animal at the annual 4-H County Fair. Notably, Green Chimneys’s engagement with 4-H does not include the sale and eventual breeding and/or slaughter of presented farm animals; each animal participant safely returns to the Teaching Barn with the student once the County Fair has ended. Additionally, accommodations or modifications are typically not

necessary for students when they show an animal (M. Doherty, personal communication, March 22, 2017). That being said, 4-H promotes an inclusive environment where all are welcome irrespective of disability.

To aid in youth preparation for this event, the General Animal Caretaker arranges for older students to practice their presentation skills with other 4-H clubs in the community. According to the Cornell Cooperative Extension of Putnam County (2017), a 4-H Club must meet at least twice a month for two hours each session and be led by an adult who upholds the philosophy, policies, and procedures of the Extension and 4-H National. At Green Chimneys, 4-H programming is incorporated throughout the Farm Science curricula, with the Farm Program Manager also serving as the 4-H Program Coordinator. To solidify a collaborative relationship with the 4-H county community, Green Chimneys' Farm Program Manager/4-H Program Coordinator has served several two-year terms as an advisory committee member for the Cornell Cooperative Extension of Putnam County over the past 15 years.

Learn and Earns – Learn and Earns are an important educational intervention at the Teaching Barn, as they provide students of all age groups with the opportunity to develop important CTE and life skills under the guidance of a dedicated mentor (e.g., a Teaching Barn Intern). Because working in a farm environment is a novel experience for most Green Chimneys students, Learn and Earn activities in the barn can be challenging. While interested students must be approved by Teaching Barn staff to participate in these activities, students may also change their mind or show frustration with unfamiliar or trying tasks. As such, the Farm Education Program Manager and



assigned Teaching Barn Intern work together to carefully consider each student's past experiences, needs, and strengths when connecting him or her to barn assignments and when setting goals that will promote student growth. During weekly intern supervision, each student's "personal growth goal" is reviewed by the Farm Education Program Manager and the student's intern; at that time, goals may be adjusted, which could lead to modifications in the student's Learn and Earn jobs. Likewise, as a student demonstrates increased knowledge, and his or her Learn and Earn experiences expand, he or she may be given more responsibility and leadership at the Teaching Barn.



There are two to three Teaching Barn Interns present during the week, and two interns (with one staff member to assist) on the weekends. Each intern supervises approximately six Learn and Earn activities per day. Each participating student works one-on-one with interns for 45 minutes once a week. When interns meet with their students for the day's session, they assess whether the student will be able to perform the planned task without causing stress to him- or herself or to the animals. Overall, the intern has the freedom to change the task in the moment to meet the students' needs and to keep all participants safe. When Learn and Earn activities are scheduled in the morning before classes start, interns will typically eat breakfast with their assigned student after the barn chores have been completed (similar to Learn and Earns in the Horse Barn; see Chapter 4).

Specific Learn and Earn tasks are largely based on a student's experience and abilities, and may include learning about animal husbandry, feeding and watering animals, cleaning stalls and replacing soiled bedding materials, preparing enclosures and habitats for new animals, transferring animals between pens and pastures, and collecting eggs from the chicken coop. The

intern guides each student through the day's designated activities, beginning and ending with marking their timesheet. Students also wash their hands before returning to the indoor classroom.

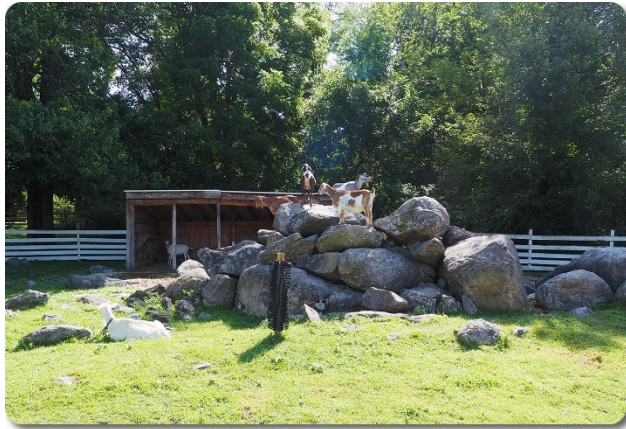
6.10 Summary

The Teaching Barn at Green Chimneys is a multi-species learning and therapeutic environment where students can participate in hands-on, nature-based, and animal-assisted programming. Depending on the student, this program area can be soothing, engaging, or overstimulating (and potentially even dysregulating), given its multiplicity of sights, smells, sounds, textures, and movement. While the sensory and kinesthetic input of the Teaching Barn can enhance the delivery of animal-assisted interventions, Green Chimneys staff must carefully consider each student's individual learning and sensory processing needs before introducing him or her to this setting.

Because farm animals may rarely be encountered by students outside of the Green Chimneys campus, interacting with them presents unique opportunities for youth to safely step outside of their comfort zones by trying something new; to gain confidence through providing and leading the compassionate care of others; and to foster meaningful connections with peers, trusted adults, members of the community, non-human animals, and the overall farm environment. In other words, animal-assisted therapies, activities, and education at the Teaching Barn support positive developmental trajectories for many youth with psychosocial and special educational needs.

As the name implies, the Teaching Barn plays a particularly salient role in augmenting the education that a student receives during traditional science and other day classes with adapted and experiential lessons in farm and animal science, CTE skills, and community engagement.

Through the process of handling and presenting a livestock animal at a county 4-H Fair, youth learn about that animal's biology, habitat, and personality; become familiar with the steps involved in completing a long-term project in full and with pride; and practice the art of public speaking and social interaction, all while in the comforting presence of an animal they have bonded with and have come to trust over time.



With several species all living under one roof, students are also able to work closely with Teaching Barn staff to learn from many different animals, often concurrently. This potential for variety – combined with the experiential quality of working in nature with other living beings – may motivate students to actively engage with the intervention and interventionist, as some research has suggested. On the whole, the multi-sensory and multi-faceted nature of the Teaching Barn setting provides Green Chimneys staff and interns with the unique ability to adapt their instruction or therapeutic approach according to the specific learning styles and/or social-emotional needs of the student with whom they are working.

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Chapter 7: Canine Program



Over nearly 35,000 years of domestication, dogs have become exceptionally sensitive to the emotions, behaviors, social cues, and attentional states of humans (Albuquerque et al., 2016; McCullough et al., 2018a; Reid, 2009; Wang et al., 2016), making them ideal companions and participants in animal-assisted activities, therapies, and education. Notably, the inclusion of dogs can enhance treatment modalities by increasing a client's (a) rapport with the care provider (Parish-Plass & Pfeiffer, 2019; Prothmann, Bienert, & Ettrich, 2006), (b) engagement and motivation to participate in sessions (Beetz & Schöfmann-Crawford, 2019), and (c) sense of emotional well-being (Fine, 2019). Canine-assisted interventions have also been tied to improved symptoms of depression, anxiety, trauma, attention deficit hyperactivity disorder (ADHD) and autism spectrum disorder (ASD), as well as to enriched learning opportunities for students (Fine, 2019). These interventions may be particularly impactful due to the documented attachment bond commonly found between humans and dogs, often facilitated via physical touch (Beetz, Uvnäs-Moberg, Julius, & Korchal, 2012; Handlin et al., 2011; Odendaal & Meintjes, 2003) and mutual gaze (Nagasawa et al., 2015).

At Green Chimneys, the Canine Program has three primary components: (a) education on how children, youth, and adults can safely interact with dogs; (b) socialization, care, and training of local shelter dogs by students in preparation for canine adoption; and (c) psychotherapy and occupational therapy sessions with students, therapists, and approved companion dogs, owned by Green Chimneys staff (also known as “campus dogs”). These interventions, combined with a myriad of other canine-assisted activities, further diversify the farm’s overall programming, and provide important opportunities for students to learn, demonstrate care and compassion, practice leadership skills, and foster safe and fulfilling social connections. In fact, Green Chimneys students often identify dogs as their favorite animal on campus (Green Chimneys students, personal communication, March 20, 2017). Of note, the Canine Program’s primary focus on student interactions with shelter dogs will be reflected in this chapter’s content.

7.1 Summary of Selected Research



June’s Dog House, built in 2014 for the Shelter Dog Interaction Program, houses canines during their socialization and training at Green Chimneys.

Research on the impact of human-animal interaction (HAI) and animal-assisted intervention (AAI) is a swiftly growing field, with increasing interest in, and serious appreciation for, the roles animals play in human psychological, behavioral, and physiological health. This is particularly evident in the inclusion and study of therapy, service, and companion dogs in interventions designed to improve human well-being. Because this field is emerging, the review of literature that follows is not intended to be an exhaustive discussion of the research and practice in this area; rather, it highlights salient findings relevant to the student population and canine programming at Green Chimneys.

Psychosocial and Behavioral Benefits of Human-Canine Interactions

In 1969, child psychologist Dr. Boris Levinson observed that the presence of his dog, Jingles, during therapy sessions appeared to alleviate much of the anxiety and “mistrust of the therapeutic process” among his young clients (Fawcett & Gullone, 2001, p. 126). Since then, researchers, practitioners, and scholars worldwide have maintained that the presence of dogs and other animals in therapy can help enhance and accelerate the therapeutic alliance (Chandler, 2017; Fine, 2019), improve the client’s perception of the clinical environment (Faber Taylor & Kuo, 2009; Hoagwood, Acri, Morrissey, & Peth-Pierce, 2016), and increase client motivation to attend and engage in sessions (Balluerka, Muela, Amiano, & Caldentey, 2014; Mallon, Ross, Klee, & Ross, 2010). According to a 2007 study, youth in anger management therapy reported that the inclusion of dogs in sessions served as a motivator for them to stay engaged in the overall therapeutic process (Lange, Cox, Bernert, & Jenkins, 2007). Moreover, other studies have found higher rates of treatment completion among children with histories of maltreatment when a dog was included in their therapy (Dietz, Davis, & Pennings, 2012; Signal, Taylor, Prentice, McDade, & Burke, 2017).

Generally, a lack of rapport and trust between a therapist and client is considered a key barrier to the successful achievement of therapeutic goals, especially if the client has poor patterns of attachment due to trauma (Parish-Plass & Pfeiffer, 2019). As mentioned above, animals are often able to facilitate this vital relationship in much the same way they do other social interactions (McNicholas & Collis, 2000; McNicholas & Collis, 2006; Parshall, 2003). For example, some may view people accompanied by dogs as friendly and approachable (Friedmann & Tsai, 2006), and/or feel more comfortable to interact with strangers through relaxed conversation about the dog or related topics (Fine, 2019; Wood et al., 2015). In clinical settings that include dogs in their services, the client and therapist are able to first build connection by talking about the dog, rather than the direct issues that prompted the client to seek therapeutic help in the first place.



In the presence of an animal, the therapy or treatment environment itself may also feel more familiar and homelike, which in turn, could help lessen any client worries or resistance regarding the process (Parish-Plass & Pfeiffer, 2019; Wu, Niedra, Pendergast, & McCrindle, 2002). AAI's are often

experiential in nature, meaning the client is able to observe the dog acting naturally, having fun, and/or receiving care and affection from the therapist even when he or she misbehaves (Parish-Plass & Pfeiffer, 2019). In this way, clients can feel safe to explore painful past experiences or new challenges without fear of rejection if they make a “mistake.” Accordingly, clients may feel safer and more at ease with the intervention as a whole, especially if a tender, trustworthy, and respectful relationship between the therapist and his or her dog is evident (i.e., “this is how I can expect to be treated in therapy too”; Parish-Plass & Pfeiffer, 2019).

Moreover, by modeling a respectful bond with his or her dog, the therapist is quietly encouraging the client to demonstrate kindness, empathy, and caregiving towards others. A common way to show fondness for an animal is through gentle touch, which also has positive bonding, calming, and sensory stimulation effects for people (Beetz et al., 2012; Fawcett & Gullone, 2001; Parish-Plass & Pfeiffer, 2019). Given that physical touch during psychotherapy is considered largely inappropriate and/or unethical (Chandler, 2017), the presence of animals during such sessions provides a distinct opportunity for the client to experience these benefits. Moreover, dogs often respond to affection by returning the favor – they typically show excitement when people they trust approach; offer comfort, loyalty, and acceptance; and provide opportunities for people to connect with others and/or have fun through play and other recreational activities (Call, Bräuer, Kaminski, & Tomasello, 2003; Fine, 2019).

Much of the HAI literature suggests a link between connecting with dogs and a myriad of mental and behavioral health benefits for diverse populations, including increased feelings of unconditional social support and companionship (Fine, 2019; Kruger & Serpell, 2006); significantly reduced loneliness and depression (Banks & Banks, 2002; Souter & Miller, 2007); and decreased anxiety, including during situations marked by high levels of stress (Barker, Pandurangi, & Best, 2003; Dietz, Davis, & Pennings, 2011; Lang, Jansen, Wertenuer, Gallinat, & Rapp, 2010). However, within this discussion, it is also important to note that some research has found that canine-assisted interventions did not significantly improve positive effects when compared to other interventions. For example, a recent study by McCullough and colleagues (2018b) found that interacting with therapy dogs in the hospital did not significantly reduce stress or anxiety for children and youth receiving cancer treatment; patients in both the intervention (standard treatment plus AAI) and control (standard treatment only) groups experienced less stress over time, “regardless of whether they visited with a therapy dog” (p. 169). Additionally, practitioners seeking to include a dog in interventions designed to benefit humans must first assess whether this would ultimately be suitable for the client and the animal by considering such factors as fear of dogs (or of humans, in the dog’s case), allergies, health status and potential for zoonosis, individual stressors, and overall interest in interacting (Fine, 2019).

Nevertheless, it has been well-reported – often by clients and patients themselves – that the inclusion of dogs and other animals in treatment offers important advantages, including in the areas of improved mood, self-esteem, and overall psychological well-being (McCullough et al., 2018b; Morrison, 2007; O’Haire & Rodriguez, 2018). For example, through canine-assisted interventions, clients have the relatively unique opportunity to gain self-confidence and mastery by teaching new skills or tasks to dogs, as well as providing care to support their well-being. Warrior Canine Connection (WCC), a program where military veterans with post-traumatic stress train service dogs for fellow veterans with physical disabilities, has been shown to help

trainers (re)build confidence, practice patience and communication skills, safely express and experience positive emotion (i.e., decreased emotional numbness), and feel a renewed sense of purpose through helping another service member and attending to the dog's daily needs (Tedeschi, Jenkins, Parish-Plass, Olmert, & Yount, 2019; Yount, Olmert, & Lee, 2012). As many scholars have noted, providing care and sincere affection for animals often leads to some of the same mental health benefits associated with receiving social support from others, such as improved mood, connectedness, and stress relief (Beetz & Schöfmann-Crawford, 2019; Dunbar, 2010; Inagaki & Orehek, 2017; Julius et al., 2013).



A veteran student uses a clicker to work on loose-leash "sit" and "stay" with this shelter dog.

In addition, research has suggested that interacting with dogs can mitigate the symptoms of certain psychological, behavioral, neurological and developmental disorders, as well as mental illness [e.g., depression, anxiety, post-traumatic stress disorder (PTSD), schizophrenia, substance addiction, and ASD; Kamioka et al., 2014; Nimer & Lundahl, 2007; O'Haire, Guérin, & Kirkham, 2015; Stefanini, Martino, Allori, Galeotti, & Tani, 2015]. As mentioned above, it has become increasingly common to see the inclusion of dogs in trauma-informed interventions (e.g., at WCC) and crisis response deployments for people experiencing post-traumatic stress. To date, AAI research findings have shown promise in mitigating trauma symptoms (related primarily to child maltreatment and military service), including avoidance, dissociation, anger, depression, and anxiety (Dietz et al., 2012; O'Haire et al., 2015; O'Haire & Rodriguez, 2018; Signal et al., 2017; Tedeschi & Jenkins, 2019; Yount et al., 2012). Additionally, AAI sessions involving dogs have been linked to significantly reduced levels of anxiety in individuals with psychotic and/or mood disorders (Barker & Dawson, 1998; Lang et al., 2010); although notably,

participants in one early study also experienced significantly reduced anxiety scores after taking part in therapeutic recreation sessions (i.e., music and art activities, education/resources regarding leisure time), with no statistically significant differences in reduction of anxiety observed between the two types of sessions (Barker & Dawson, 1998).



Recently, increased research attention has centered on the impacts of canine-assisted interventions for children and youth diagnosed with ADHD and ASD. For example, a 2015 study found that children (aged 7-9 years) with ADHD assigned to a treatment condition [i.e., interaction with

live therapy dogs and exposure to humane education materials, in conjunction with cognitive behavioral therapy (CBT)] showed a greater reduction in ADHD symptoms and problematic behaviors than those in the comparison group (Schuck, Emmerson, Fine, & Lakes, 2015).

Children in the comparison group were also exposed to the same curricula and CBT, but their interactions were with toy dogs (i.e., realistic puppets), which arguably constitutes another form of animal-assisted therapy. Of note, parents in both groups reported an increase in prosocial skills and behaviors among their children over the study period.

AAIs involving canines have also been associated with enhanced social-emotional learning (SEL) and functioning for children with ASD, including positive emotional displays (e.g., smiling and laughing), increased verbal social behaviors, and greater focus on the faces of peers in the presence of a dog (Fung & Leung, 2014; Nimer & Lundahl, 2007). Likewise, in a systematic literature review of 22 studies conducted from 2012-2015, key outcomes of canine-assisted interventions for autism included improved social interactions, increased communication and positive emotions, and reduced problem behaviors (e.g., hyperactivity;

O’Haire, 2017). Canines may be particularly engaging for children with ASD due to their “highly anticipatory, unhurried, structurally simple and easy to interpret social actions” (Solomon, 2010, p. 157). Further, because dogs rely primarily on nonverbal communication,

...it might be easier for children with autism to comprehend dogs’ communication than to comprehend humans’ communication, which is sometimes muddled by pretense, metaphor, deception, or irony (Fung & Leung, 2014, p. 254).

A common therapeutic intervention for children with autism and other physical, sensory, and cognitive conditions is occupational therapy. According to Andreasen and colleagues (2017, p. 2), “...occupational therapists [OTs] can use [animal-assisted therapy] to facilitate the use of performance skills including motor skills, process skills, and social interaction skills” among children with various disabilities. Further, dogs and other animals can play an important role in supporting OTs in assisting young clients in achieving independence in central daily living activities, such as “education, work, play, leisure, and social participation” (American Occupational Therapy Association, 2014; Andreasen et al., 2017, p. 2). These therapeutic advantages may be due, at least in part, to most children being highly motivated to interact with animals (American Occupational Therapy Association, 2014; Andreasen et al., 2017). Likewise, the treatment goals of animal-assisted therapy and occupational therapy are largely analogous and, thus, complementary; for example, both seek to strengthen social skills, reduce anxiety and loneliness, increase self-esteem and mastery, improve focus and awareness, and provide joy and levity (Andreasen et al., 2017; Poleshuck, 1997).



Physical and Physiological Health Benefits of Human-Canine Interactions

Noted physical health benefits of dog ownership include increased exercise and physical activity (Cutt, Giles-Corti, Knuiman, & Burke, 2007; Levine et al., 2013; Nimer & Lundahl, 2007), improved immune system functioning (Nimer & Lundahl, 2007), and reduced risk of dying from cardiovascular disease (Anderson, Reid, & Jennings, 1992; Friedmann, Katcher, Lynch, & Thomas, 1980). Several psychophysiological mechanisms, such as arousal modulation and neuroendocrine changes, are also thought to underlie the positive impacts of HAI (O’Haire, Tedeschi, Jenkins, Braden, & Rodriguez, 2019). Likewise, reductions in systolic and diastolic blood pressure, heart rate, and skin conductance during calm therapeutic interactions with dogs and other animals are well-documented (Friedmann, Katcher, Thomas, Lynch, & Messent, 1983; Handlin et al., 2011; Kuhne, Hößler, & Struwe, 2014; Odendaal & Meintjes, 2003; O’Haire, McKenzie, Beck, & Slaughter, 2015). As such, Odendaal (2000) has argued that interacting with a therapy dog in a clinical setting can be as beneficial for clients (in terms of preventing hypertension, coronary heart disease, and other stress-related conditions) as connecting with a personal companion animal can be for dog owners.



Additionally, neuroendocrine changes and hormonal synchronization are often observed during human-canine interactions. In 2012, one study found significantly lower levels of cortisol, a hormone that is closely associated with both positive (“eustress”) and negative (“distress”) experiences of stress, among male children with insecure or disorganized attachment patterns who interacted with dogs as compared to children whose sessions included either a friendly human or a toy dog (Beetz et al., 2012). Studies also indicate that people who connect with dogs experience elevated levels of the attachment hormone, oxytocin, which is often facilitated

through physical touch and mother-infant bonding (Beetz et al., 2012; Handlin et al., 2011; Odendaal and Meintjes, 2003). Furthermore, Nagasawa and colleagues (2015) recently found increased oxytocin in both humans and their pet dogs after mutual gazing (i.e., looking into one another's eyes), signifying a strong attachment relationship and the co-evolution of human-canine connection.

Canines in Educational Settings

As discussed above, the presence of dogs may enhance clinical and educational settings due to their capacity to improve one's perceptions of others and of the physical tone and space of an environment that may otherwise feel unsettling (i.e., a therapy office, a school classroom, a hospital). Research conducted in an elementary school in Vienna found that the presence of a "classroom dog" helped improve the atmosphere in the classroom environment by promoting social cohesion and integration, with fewer student aggressive behaviors noted by teachers in comparison to classrooms without a dog (Hergovich, Monshi, Semmler, & Zieglmayer, 2002). Similarly, Kortschal and Ortbauer (2003, p. 147) found that an elementary school classroom (also in Vienna) became "socially more homogenous" when a dog was present than when he or she was absent. In this study, researchers videotaped class sessions during a one-month control period (no dog) and one-month intervention period (with a dog), and observed decreased aggressive and hyperactive behaviors among students when the dog was present (Kortschal & Ortbauer, 2003). Of note, the dog's presence appeared to be especially beneficial for boys and for children prone to social withdrawal in terms of classroom integration (Kortschal & Ortbauer, 2003).



Arguably, enhanced social cohesion in conjunction with HAI (in this case, canine presence and bonding) in the classroom may have positive implications for respectful peer and student-teacher relationships. For example, there is some evidence that including dogs in classroom environments can encourage responsibility and empathy, increase positive behaviors initiated toward the teacher, and improve attitudes toward school among children with emotional and developmental disabilities (Anderson & Olson, 2006; McCullough, Ruehrdanz, Garthe, Hellman, & O’Haire, in press; Walters Esteves & Stokes, 2008). As children with special needs



tend to report experiences of being bullied in far greater numbers than do typically developing children (60% to 25% respectively; Marshall, Kendall, Banks, & Gover, 2009), interventions that promote social integration, SEL, and kindness towards others in the school environment can be beneficial on a broad scale. Indeed, research has shown that connecting with dogs in the classroom can enhance childrens’ empathy for animals, and may foster increased sensitivity to the needs and emotional states of others (Hergovich et al., 2002).

Increasingly, research has also shown that dogs in schools and other educational settings can have tangible effects on learning and certain academic competencies. For example, given their supportive, nonjudgmental and motivating nature (Friesen, 2010; McCullough et al., in press; Shaw, 2013), dogs are often included in literacy programs for children. Indeed, research shows that learning to read with a dog can enhance children’s attitudes toward academic reading (Linder, Mueller, Gibbs, Alper, & Freeman, 2018), and increase sustained on-task reading aloud behaviors among elementary school children with emotional and behavioral disabilities (Bassette & Taber-Doughty, 2013). Likewise, a recent study of Chicago’s SitStayRead program, which pairs certified “Reading Assistance Dogs” with children learning to read (many of whom

come from low income households), found that children who participated in this free program “developed reading fluency at a rate 47.8% greater than their non-participating peers” (Kirnan, Ventresco, & Gardner, 2018; SitStayRead, 2019, para. 2). What is more, participants reported that they had greater confidence in their academic abilities after completing the program (Kirnan et al., 2018). Likewise, several studies in early childhood education have demonstrated that the presence of dogs in the classroom positively impacts preschool children’s concentration and motivation, as well as their ability to follow instructions and perform motor skills and cognitive tasks (e.g., object categorization) with greater accuracy (Gee, Belcher, Grabski, DeJesus, & Riley, 2012; Gee, Church, & Altobelli, 2010; Gee, Crist, & Carr, 2010; Gee, Gould, Swanson, & Wagner, 2012; Gee, Harris, & Johnson, 2007; Gee, Sherlock, Bennett, & Harris, 2009). While these findings are indeed encouraging, scholars (i.e., Hall, Gee, & Mills, 2016) have argued that more rigorous research is needed to fully demonstrate the impact of dogs on children’s reading abilities and other academic outcomes.

7.2 Overview of the Canine Program



Each shelter dog is honored with a posted bio featuring his or her new forever home and new human companions.

In partnership with Educated Canines Assisting with Disabilities, Green Chimneys’ Canine Program initially centered on pairing students with service dogs-in-training to teach them over 80 tasks associated with assisting an individual with a physical disability (e.g., guiding a person with a visual impairment, opening a refrigerator door, and retrieving important objects; Arky, n.d.). Sixteen children at a time were involved in the program and committed to working with

the dogs for two hours a day for one year. However, over time, the complexity and somewhat arduous nature of training puppies to be service or guide dogs became less aligned with the therapeutic mission of the school. As such, there was a brief hiatus in the Canine Program between 2013 and 2014, during which time the shelter dog training and interaction component was established.

The current Canine Program has a strong emphasis on including students in the socialization and training of shelter dogs to improve the dogs' adoption prospects, thereby providing an important service to the greater community. This work stemmed from a collaboration with Animals for Adoption, an animal shelter located about an hour northwest of Green Chimneys in



Dog visits to the residential dorm can make this environment feel more like home for children and youth living on campus.

Accord, NY. Through this partnership, Green Chimneys and Animals for Adoption strive to provide positive and mutually beneficial socialization and connection experiences for both the student and canine participants. Shelter dogs receive care and socialization through training, as well as participating in such student activities as vocational and other education classes (e.g., reading with children), dorm visits, after-school clubs, and greeting students at the bus stop when they arrive for school. In addition to shelter dog socialization and training, social work and occupational therapy staff who qualify and meet prior approval may bring their pet dogs (or approved campus dogs owned by other staff) to Green Chimneys to participate in canine-assisted therapy with students.

The presence of a dog in a classroom setting can provide a sense of calm (or, alternatively, excitement), social and emotional support, and motivation for learning and engagement. For

example, when a Green Chimneys student is anxious and having difficulty regulating his or her emotions and behavior, the student may be offered a break to interact with a dog in a separate environment supervised by a teaching assistant (TA). This provides an opportunity for the student to calm down physically and emotionally by engaging in a supportive interaction free of expectations and judgment, thereby strengthening the student's ability to re-enter the classroom more focused and motivated to learn. Likewise, recent interviews with youth at Green Chimneys indicate that dogs provide an impetus for them to attend school, and that they prefer classes on campus to those in public schools because of their interactions with the dogs (Green Chimneys students, personal communication, March 20, 2017).

7.3 General Policies, Practices, and Procedures

Shelter Dog Interaction

Every six weeks, Animals for Adoption brings three to four new dogs to Green Chimneys; these dogs have been screened for suitability for interacting with children and youth, live in designated kennels (or “dorms;” see description below), and receive care and training from students and staff to aid in their ultimate adoption from the shelter. Although a rare occurrence, dogs who are not adopted during their stay at Green Chimneys are returned to the shelter. Prior to working with a shelter dog, students learn how to participate in daily canine care activities (e.g., feeding, watering, exercising, playing, bathing, brushing, and housebreaking) and the fundamentals of dog training (e.g., basic commands). Moreover, the program's training philosophy emphasizes positive reinforcement for three primary reasons: (a) it is considered a more effective and humane training method than punishment or negative reinforcement methods (Stillwell, 2019); (b) it helps students build meaningful and supportive relationships with the dogs (The Humane Society of the United States, n.d.); and (c) it demonstrates that imperfection and mistakes, especially during the learning process, are normal and do not warrant harsh discipline or abuse. Notably, these elements of canine positive reinforcement

parallel the learning processes that students are expected to engage in, making these interactions most fitting for therapeutic and educational settings.

Canine-Assisted Therapy

In 2005, Green Chimneys formed an interdepartmental Animals in the Therapeutic Milieu Committee to implement and oversee policies regarding the presence of employee pets on campus. In order to be considered eligible to bring a companion dog to work, staff members (e.g., social workers and OTs) must have owned their dog and been employed at Green Chimneys for at least three months. Although completion of a formal canine training program is not a prerequisite for participation, the dog must be at least six months of age, housetrained, well-

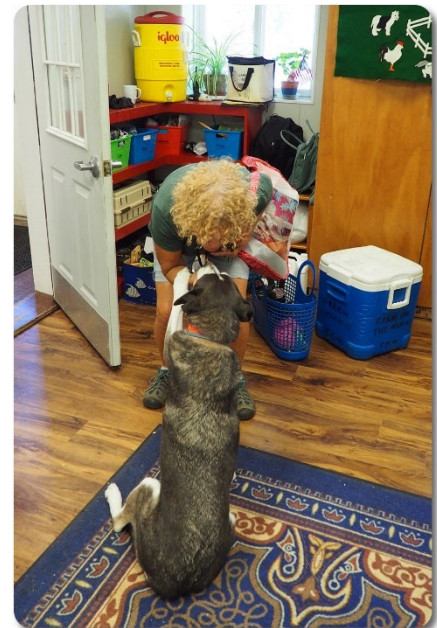


groomed, spayed or neutered, up-to-date on all vaccinations and licensing, and approved by a veterinarian to participate. Staff are required to attend a one-hour training with the Shelter Dog Interaction Program Manager and Canine Behavior Specialist/Shelter Manager (see descriptions in Section 7.4), reviewing AAI best practices and proper dog handling techniques to ensure the safety of all parties. Additionally, interested staff must outline the anticipated therapeutic purpose of having the dog on campus; their plans to evaluate the therapeutic impact of including the dog in interventions; and specifics regarding animal care and supervision. This information is then provided to the employee's department Director and the Chairperson of the Animals in the Therapeutic Milieu Committee for consideration and/or approval.

Primarily, the Committee evaluates staff and their personal dogs according to the following criteria (Green Chimneys, 2014):

- *The dog must be able to demonstrate reliable and safe behavior with people of all ages, other animal species, and the surrounding environment (i.e., excessive barking, jumping up on people, leash pulling, failure to follow basic commands, and aggression are not acceptable)*
- *The staff member must be able to easily control his or her dog while on campus, including during interactions with other dogs, students, and colleagues*
- *The staff member must provide proper and continuous care, handling, and supervision of the dog while he or she is on campus*
- *The dog must be on leash when he or she is outside the staff member's office or personal work area*
- *The inclusion of the dog in the Canine Program should enhance therapeutic or educational interventions with students and their families*
- *The dog's presence should not negatively impact students, other staff or programming, nor should the dog interfere with the activities of the shelter dog interaction component of the Canine Program*

After a staff member has been approved to bring their personal dog to campus, they are put on a three month trial period and re-evaluated periodically via interviews or surveys with other employees. Additionally, companion dogs must accompany their owners for at least five shifts per month, and may be asked to discontinue their participation if others experience allergies or anxiety while in their presence. Employees are financially and legally responsible for any damages their dog may cause, and are personally liable for the behavior and actions of their dog while on campus (Green Chimneys, 2014). No more than 19 companion dogs may participate in the program at one time, including 12 on the main Brewster campus, 3 in off-campus community-based services, 2 at the Clearpool campus, 1 at

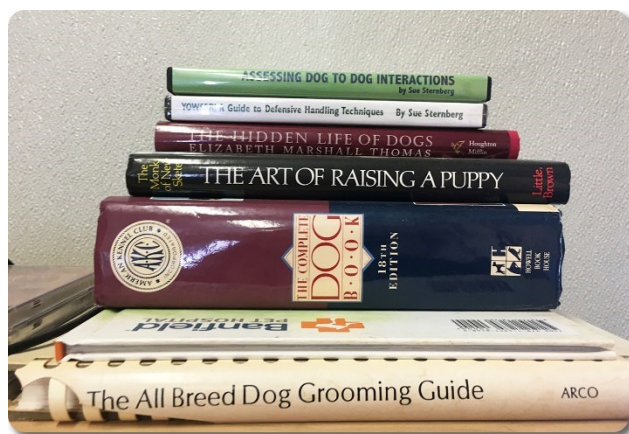


A staff member shares a special, affectionate moment with one of Green Chimneys' campus dogs.

the Nature's Nursery, and 1 at the Connecticut group home; of note, the exact number of dogs at each location tends to vary.

Overall Safety Procedures in the Canine Program

Based on their level of interest and comfort regarding dogs, students are given the choice of whether they take part in any aspect of Canine Programming. For instance, students who have a fear of dogs are not forced to participate; rather, they are encouraged to observe others interact with dogs, and to take their time getting to know the animals prior to engaging in any canine activities. That said, youth with severe allergies are generally not allowed to participate. All interventions in this program area have specific guidelines and rules that students must follow in order to safely and humanely interact with a dog (see below under Section 7.7 for detailed information). For example, youth are taught proper ways to greet a dog (i.e., asking the owner for permission to engage, respecting the dog's personal space, waiting for the dog to approach and/or slowly approaching the dog, kneeling on the ground, engaging in appropriate and gentle touch), and are asked to model this skill for their peers and/or Green Chimneys visitors. Additionally, when students work or interact with dogs, they are discouraged from raising their voices or crowding the dog's face and head.



Other safety practices include teaching youth how to read each dog's individual and canine-specific behavioral cues (e.g., signs of stress, calming, and affiliation), and how to hold a leash, lead, or harness when walking a dog. When giving treats to dogs, youth also learn to use a flat hand to encourage a gentle and safe interaction. In addition, students are not allowed to enter individual kennels or dog runs unsupervised; they must first wait outside the kennel for a staff

member to retrieve the dog. Within the larger kennel facility (i.e., “June’s Dog House”), these policies are posted on the wall as a visual reminder for students in the program.

7.4 Staffing

Currently, Green Chimneys does not require prospective staff, interns, or volunteers to have specific degrees, certifications, or employment histories to work in the Canine Program, although prior experience with dogs and a demonstrated knowledge of the Green Chimneys mission-based model are strongly preferred. Given that dogs are often incorporated into all program areas across campus and the Green Chimneys community, having this specific knowledge and experience is advantageous.

Shelter Dog Interaction Program Manager – With the guidance and support of the Canine Behavior Specialist/Shelter Manager from Animals for Adoption (see below), the Shelter Dog Interaction Program Manager oversees the care, socialization and training of shelter dogs, as well as all human-canine interventions involving shelter dogs at Green Chimneys. This individual is supported by a Program Assistant and an Intern (see below), and works with the Canine Behavior Specialist/Shelter Manager to facilitate regular educational sessions for colleagues and students regarding the proper care and handling of all dogs within the Canine Program.

Canine Behavior Specialist/Shelter Manager – A staff member from Animals for Adoption provides ongoing consultation and educational resources regarding canine behavior and training, while regularly evaluating the behavioral and physical health of the resident shelter

dogs. This canine behaviorist works closely with the Shelter Dog Interaction Program Manager, other Green Chimneys staff and interns, students, and the shelter dogs themselves to ensure that both training and animal care are well-informed. This individual and his or her team also teach the Dog Education Class and Canine Career Technical Education Class (see Section 7.9), with the support of Green Chimneys staff and interns.



Birds of Prey Day is an excellent venue to spread the word about the important work being done by Animals for Adoption and Green Chimneys' Canine Program.

Canine Program Facilitators – Green Chimneys teachers and other staff who are interested in working with dogs often serve as facilitators of canine-assisted interventions (e.g., group therapy sessions, dorm visits, morning bus greetings, crisis management; see Section 7.9). These staff receive specialized training in working with dogs, with a focus of keeping them and the students safe and happy. This training focuses on how to handle dogs, what to do if concerns arise during student-canine interactions (e.g., a child interacting inappropriately with a dog, a dog reacting aggressively to a child), and how to recognize and interpret signs of canine stress, discomfort, or affiliation.

Farm/Canine Program Assistant – The Farm/Canine Program Assistant is responsible for supporting the Shelter Dog Interaction Program Manager and all aspects of Green Chimneys' Canine Programming, such as maintaining the health and accessibility of the dog dorms, contributing to canine care and facility management, mentoring students through Learn and Earn activities, developing after-school and weekend programs within the Canine Program, and

assisting with special community events. As needed, this individual also assists with other program areas across campus, including the Teaching Barn (see Chapter 6) and Recreation Department (see Chapter 11).

Canine Program Intern – Canine Program internships are offered for four or eight month periods, during which time interns manage a caseload of approximately 25 students. Canine Program interns work one-on-one with students during Learn and Earns, while also assisting with dog education classes and after-school programming. When teachers request to have a dog in the classroom, the intern is responsible for accompanying the dog to ensure the safety of staff, students, and the animal.

Canine Program Volunteers – Volunteers from the local community contribute to select canine-assisted interventions, such as working with the dog education classes and supervising students during shelter dog walking activities during after-school club (or “Dog Club”; see Section 7.9). Volunteers in the Canine Program are required to complete the same training as staff and interns, which includes Therapeutic Crisis Intervention and an introduction to the Green Chimneys philosophy of care. In addition, Canine Program volunteers must complete



A fenced dog park (attached to the kennel facility) provides ample space for dogs to play and socialize with other dogs, staff and students, as well as engage in activities similar to agility training.

program-specific training that focuses on dog handling skills, addressing difficult situations that may arise between students and dogs, and interpreting behavioral signs of canine stress and affiliation. Volunteers are also asked to remove dogs if they see signs of distress and report any potential issues to Canine Program staff.

7.5 Facilities and Tangible Resources

Built in 2014, June's Dog House is a six-kennel, temperature controlled boarding facility on the Green Chimneys campus. Four 4' x 6', wood-plank kennels are consistently used for shelter dog participants of the program (pictured below), while the other two are typically held open as back-up for additional canine residents or storage. Shelter dogs are housed individually in adjacent kennels, and may or may not be crated at night depending on their individual needs.

Near the kennel facility is a 30' x 200' outdoor run/dog park where dogs can engage in recreational play activities with each other and Green Chimneys staff and students.

Additionally, outside of therapy sessions, campus companion dogs spend most of their time in their owner's office, where they may be free to roam off leash with prior permission from the employee's department Director, the Animals in the Therapeutic Milieu Committee, and fellow staff who work nearby.



All dogs are allowed to visit most areas on campus (with the exception of the Wildlife Center and Horse Barn), as long as they are accompanied by at least one adult, are on leash, and are not presenting a safety hazard or disruption to other animals or people. For instance, students may take companion or shelter dogs for supervised walks on Tom's Trail, a nature path in a semi-wooded area that circles behind the farm and animal pens on the north side of campus (see *Green Chimneys Campus Map* on page 10). However, dogs are not allowed to directly approach horse pastures, as this may be distressing for both species (e.g., a horse may spook). In addition, resource materials in the Canine Program include dog leashes, leads, and harnesses; agility training equipment; crates; clickers for clicker training; dog waste bags; videotapes of canine

behavior; and handouts outlining canine body language, various training methods, and appropriate ways to greet and interact with dogs.

7.6 Animals in the Canine Program

Shelter Dogs



All shelter dogs in the Canine Program are brought to Animals for Adoption from rescue organizations in the southern United States. Before making the transition to Green Chimneys, they receive a thorough wellness exam with vaccinations and are spayed or neutered. In order to screen for his or her suitability for the Canine Program, dog trainers at Animals for Adoption thoroughly assess each dog's temperament, including his or her sociability, adaptability, response to handling (e.g., petting, walking, grooming), tolerance of other animals and species, and tendencies to resource guard. Likewise, each dog's personality is considered before involving him or her in specific activities that may cause undue stress. Shelter dogs selected for the program are transported in groups of four to Green Chimneys, where they live and are trained and socialized for six weeks. From the time they first arrive on campus, dogs are made available for adoption, with eventual placement in homes that best meet their individual needs. That said, dogs who are adopted during the training period remain in the program until the full six weeks of work have been completed.

The overarching goals of the shelter dog interaction component of the Canine Program are to ensure that:

1. *Dogs and Green Chimneys students receive socialization support through their interactions with each other, staff, the community, and the diverse environments on campus*
2. *Students gain confidence by connecting with the dogs and being responsible for their care and well-being*
3. *Dogs learn basic manners and obedience skills (e.g., sit, stay, come, leave it) that will enhance their chances of adoption*

As of May 2019, 159 shelter dogs have been adopted from the Canine Program (Green Chimneys, 2019), with a 0% return rate (J. Kopelman, personal communication).

Companion Dogs

As outlined under Section 7.3, a maximum of 19 campus companion dogs may participate in the Canine Program, each of whom must be at least six months of age and well-behaved. Dogs who accompany their owners to the Green Chimneys campus must also be spayed or neutered, fully vaccinated, well-groomed, and housetrained. Moreover, each dog's temperament and personality must be conducive to working with children and youth in an often distracting and sometimes chaotic environment. To support the safety and mutuality of these interventions, companion dogs must demonstrate predictability in their behavior, as well as a genuine interest in interacting with people. Any staff member who brings a companion dog to work must have a private office where the dog may retreat to if he or she experiences stress or fatigue. Dogs with any noted aversion or aggression towards people or other animals are not permitted on campus.



Some shelter dogs make such an impression at Green Chimneys that they never leave, instead being adopted by staff who often bring them to campus for reunions such as this one, much to the delight of other staff and students.

7.7 Considerations for the Humane Care of Animals

The welfare of all animal species living and working on Green Chimneys' campus is of paramount importance. Given their extraordinary sensitivity to humans and general tendency to please, dogs are vulnerable to experiencing stress during AAIs with children and youth who experience a range of psychosocial and physical challenges (Glenk, 2017; McCullough et al., 2018a). As such, considerations must be made with care regarding the well-being and humane treatment of canine participants by Green Chimneys staff, students, and visitors.

All Green Chimneys staff, interns, and volunteers wishing to incorporate shelter or companion dogs into their work, which is done approximately twice a week for 30-60 minutes per session, are required to complete a training on AAI best practices and proper handling techniques, as well as how to supervise and ensure mutually respectful interactions between youth and dogs. Specifically, these individuals are taught the importance of attending to canine behavioral indicators of stress and affiliation, as well as how to advocate for the dog's well-being during various interventions and activities. If, for any reason, a student becomes escalated to the point that he or she is unable to follow the program's safety guidelines, the dog is removed from the situation by a Green Chimneys staff member, intern, volunteer, or another student.

Specific guidelines aimed at promoting the safety and welfare of all students and dogs participating in the Canine Program include: (a) never harm any dog, yourself, or others; (b) do not verbally berate or yell at any dog; (c) do not intimidate or challenge a dog (i.e., by staring directly into his or her eyes); (d) allow a dog to seek interaction with you, especially when meeting for the first time; (e) always ask an adult before interacting with a dog, especially one just returning from a training session; (f) approach and interact with a dog respectfully, making sure to avoid contact with his or her head (at least initially); (g) attempt to understand each dog's individual temperament and behavioral language; (h) provide the dog with opportunities

to retreat to a private, safe location when showing signs of stress and/or fatigue; (i) do not feed a dog unless first instructed or permitted to do so by a staff member, intern, or designated volunteer; (j) refrain from laying down or sitting on the ground with the dog; and (k) do not make direct contact with the dog's mouth or allow the dog to lick a person's face.

The Five Freedoms in the Canine Program

Freedom from thirst and hunger – The shelter dogs living at Green Chimneys are given continuous access to fresh water while in the kennel facility, outdoor run, training areas, and vocational classroom located in the Dining Hall adjacent to the kennel facility; water bowls are also placed around campus in areas frequented by dogs, and are monitored and filled when needed. Additionally, all dogs have access to water when they are working, unless a water bowl is not readily available (e.g., during a walk on Tom's Trail). However, these activities are typically limited to 15-20 minutes, with water being offered to the dog before and after.

ROOM #	DOG NAME	SCOOP
2.	Sage	2 cups 2x/day (L, L)
3.	Munchkin	1/2 cup AM, 1/4 cup PM (M in am, S in PM)
4.	Buttercup	1/2 cup 2x/day (L, M)
5.	Leon	cup 2x/day (L)

Freedom from hunger is assured through feeding the shelter dogs once in the morning and again in the afternoon. The amount of food each dog receives is based on their weight and/or breed, and is tracked via checklists in the kennel facility. However, if caretakers or youth notice that a shelter dog

is especially food-motivated, a scoop of kibble may be offered (and noted on the dog's food intake checklist to prevent overeating). Additionally, social workers, OTs, and other staff who bring their own pet dogs to Green Chimneys are responsible for ensuring that the dog has ample access to fresh water at all times (i.e., in their office and during therapy sessions), and must feed their dog according to his or her typical schedule and dietary needs.

Freedom from discomfort – Various measures are in place to keep all dogs on campus free from any discomfort. For example, the shelter dog dorm provides both heating and air conditioning to ensure the indoor temperature is comfortable regardless of season or time of day. The facility is also kept clean and safe through daily sweeping and mopping (with a bleach and water solution), and when dogs urinate, defecate, or vomit in their individual kennels, they are promptly removed from the immediate area so that staff may sanitize the environment with a non-toxic disinfectant. Shelter dogs are also provided with clean and soft bedding in their individual kennels. Likewise, social workers, OTs, and other staff must also provide adequate and quiet space in their offices so that their companion dog may rest comfortably between therapeutic sessions.

During inclement weather, staff apply animal-friendly salt to the snow and ice in front of the kennel facilities in order to prevent slips and falls; in situations that require the use of other salt or de-icer products, canine handlers (including students) know to walk dogs on the snow to ensure their paws are not affected by these products. Staff and interns may also apply a natural and temporary animal-friendly wax to the bottoms of the dogs' paws in order to provide a breathable barrier designed to protect them from the cold. Additionally, shelter dogs are washed and groomed by students and interns when dirty and receive nail trims and teeth brushing on an as-needed basis. In their career technical education (CTE) classes, students learn how to



assist with a dog's oral health through proper and gentle teeth brushing. Social workers, OTs, and other staff are also expected to attend to their pet dog's individual health and grooming needs, both at home and while on campus.

As discussed earlier, Green Chimneys employs a scientifically supported positive reinforcement training model, where shelter dogs are rewarded for “good” behavior rather than punished for “bad” behavior. Moreover, all shelter dogs are provided with enrichment through regular access to outdoor exercise, as well as exposure to different environments across campus and on hiking trips in the surrounding area. Unstructured playtime in the outdoor dog run with other dogs, and with toys made by Green Chimneys students, is key. Companion dogs must also be given opportunities to urinate, defecate, and play through walking and other outdoor activities. In an effort to support mutually beneficial interactions between youth and dogs, staff are encouraged to consider the individual temperament and interests of all dogs prior to pairing them with a particular student or activity. Dogs who are noticeably uncomfortable during a training, therapeutic, or educational session are removed from the situation and provided with respite.

Freedom from pain, injury, and disease – The Canine Program team collaborates with shelter veterinarians and designated staff at Animals for Adoption to monitor the overall health of each shelter dog, and to administer medication and treatment (e.g., heartworm and flea and tick prevention) as needed. Because Green Chimneys is an active, multi-species farm environment, shelter dogs also receive additional vaccinations – such as Leptospirosis – to help guard them against disease. Given their relatively short participation in the program, major health concerns among the shelter dogs are not common. That said, Canine Program staff are trained by the Canine Behavior Specialist/Shelter Manager to respond swiftly to any sign of pain, injury, or illness. In addition, social workers, OTs, and other staff must keep their pet dogs’ vaccinations and wellness exams up-to-date, and promptly respond to any signs of injury or disease; if a companion dog is ill or in pain, he or she should receive proper treatment and stay at home until the presenting issue has been resolved. Staff are solely responsible for any costs associated with the medical care, treatment, and general maintenance of their companion dogs.

Freedom from fear and distress – All Green Chimneys students and staff who work with dogs (whether shelter or companion) receive training on how to read canine-specific signs of stress, such as restlessness, excessive or prolonged panting, yawning, lip licking, self-directed behaviors, and turning away from the person seeking contact (McCullough et al., 2018a). Canine Program staff also conduct trainings with their Green Chimneys colleagues on how to keep dogs safe during potential crisis and other high-stress situations, such as encountering loud noises, exposure to farm animals, or when experiencing a new environment. Overall, students, handlers, and staff are taught to treat each dog humanely and with respect, to actively attend to any indicators of fear and distress, and to always act in accordance with the dog’s best interests. In order to safeguard everyone on campus, dogs are also carefully monitored for any aggressive or overly anxious behaviors, and are always kept at a distance from other animals whom they may find fearsome (e.g., horses and wildlife). At least three hours of downtime are included in each shelter dog’s daytime schedule so that they have an opportunity for restful calm and relaxation, according to their individual needs. Owners of companion animals who are part of the Canine Program are responsible for determining when and how often their dogs should be provided with respite.



Freedom to express normal behaviors – Shelter dogs at Green Chimneys are given the freedom to express normal, species-specific behaviors in virtually every aspect of their time in programming. For instance, shelter dogs are given several hours each week of open playtime with students, staff, and other dogs at the outdoor dog run; of note, daily play also occurs during feeding, socialization, training, and canine-assisted activities and interventions. Shelter dogs are

also provided with opportunities for exploratory play, including scent work around campus and in other natural environments offsite. The Farm and Wildlife Director recently remarked,

What I find noteworthy is that we have a wide tolerance for canine behaviors that normally would not be acceptable in therapy dogs ... the shelter dogs do not need to be gentle. They can be rambunctious, a little shy, jump on people, be somewhat unruly and, in the course of their time here, these behaviors often become much less. In that way, these shelter dogs become more adoptable, while the kids learn to relate to their different needs (M. Kaufmann, personal communication, July 30, 2019).

Of note, any displays of aggressive canine behavior toward a human or other animals are generally not tolerated, as the safety of everyone at Green Chimneys is critical. In such rare incidences, all known details are documented by the Canine Behavior Specialist/Shelter Manager, and the shelter dog may be re-evaluated to assess whether Green Chimneys is, in fact, a suitable temporary placement for this animal. As discussed above, companion dogs are also provided frequent opportunities for play, exploration, and respite while working on campus. However, they are generally kept separate from activities that include shelter dog participants.



Veterinary Care

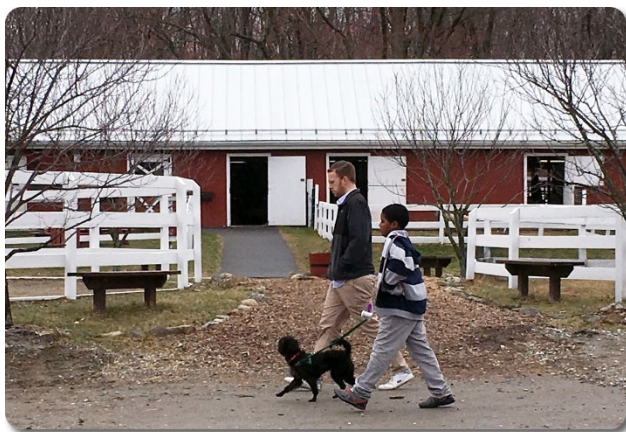
Animals for Adoption facilitates the veterinary care of each shelter dog in the Canine Program, including his or her wellness examination prior to arriving at Green Chimneys; each dog has a designated medical form on file that documents his or her vaccinations, deworming, and microchipping. During a dog's six-week stay on campus, Canine Program staff will administer any needed medical treatment and care onsite, as prescribed by Animals for Adoption

veterinarians. Should the dog's condition require veterinary or emergency attention, the animal is taken to a veterinary clinic located near the Green Chimneys campus. General health checks by a veterinarian are not typically completed during a dog's stay at Green Chimneys, given his or her recent exam prior to entering the program. At the time of this writing, veterinary care of any kind has not been documented as a need of any shelter dog in the Canine Program. In addition, each campus companion dog's veterinary care is the responsibility of his or her owner and must be kept up-to-date in order for the dog to participate in programming. This documentation must be submitted at the time of application and, if approved, any time there is a renewal. Green Chimneys' administrative assistant maintains the file containing vaccination and licensing information for all approved campus dogs.

7.8 The Canine Program as a Context for Positive Youth Development

The *Big Three* in the Canine Program

Positive and sustained relationships between youth and adults – In the Canine Program, students create positive and sustained relationships with adult mentors as they learn how to properly handle, train, and care for shelter dogs (e.g., in Learn and Earn activities). Since dogs take part in nearly every aspect of programming at Green Chimneys, it is essential that students work collaboratively with experienced program staff and canine handlers to master these skills. Once staff are confident in a student's ability to safely handle a shelter dog, the student is given



the responsibility of leading that particular animal's daily care. Through this experience, students often gain the confidence to advocate for the dog's proper treatment by sharing their knowledge with fellow peers and adults. As discussed earlier in this chapter, dogs have also been shown to

facilitate positive social interactions among some people, including rapport between therapists and clients. In this way, a dog's presence in therapeutic and educational activities at Green Chimneys often enhances the relationship youth share with adults.

Activities that build important life skills – Through connecting with dogs in therapy, learning about their behavior and/or caring for their daily needs, youth are able to build a variety of life skills – from responsibility to nurturance to self-regulation. Given that safety during interventions is of utmost importance, students must learn to self-regulate their emotions and behaviors in order to interact with any dog. A key component of this skill is for students to be aware of, and responsive to, the surrounding environment, and of the dog's behavioral response to their actions (e.g., noticeable canine distress, such as shaking, following a child's emotional outburst). With time, it is anticipated that these skills will translate to other social situations and relationships in the student's life. Additionally, by providing shelter dogs with food, water, playful exercise, grooming and a clean environment, students learn the inherent value and rewards of caring for someone outside of themselves.

Opportunities for youth to use life skills as participants in, and leaders of, valued community activities – Acquiring canine-specific knowledge, skills, and responsibilities allows students to demonstrate leadership in activities that make a meaningful difference for individual shelter dogs, their future caregivers, and the broader community. More importantly, they see themselves as leaders; many students gain self-assurance and a sense of mastery in their newfound



Students participating in Green Chimneys' Canine Program attended a local community college's health fair and gave oral presentations about their experiences training shelter dogs.

handling and training abilities, and are able to share what they have learned with Green Chimneys staff, fellow students, and members of the community to ensure safe human-canine interactions. Likewise, through participating in training activities, students are able to contribute to the successful and happy future of another living being.

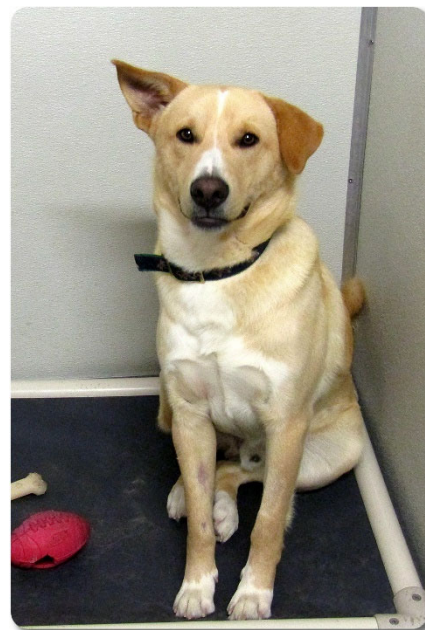
The *Five Cs* of PYD in the Canine Program

Competence – Through the shelter dog interaction component of the Canine Program, students master new and complex skills related to the handling, training, and caring of shelter dogs. Youth take dogs for walks in a variety of terrain, help them learn specific and challenging skills, and provide for their comfort and well-being on a daily basis. While each of these activities requires patience and hard work, students typically have the benefit of witnessing the fruits of their labor; for example, dogs often wag their tails during a walk, perform a task they are taught, and appear noticeably content when receiving a meal. As a result, students are able to experience a sense of *competence* and pride in a job well-done. Over time, youth become even more adept at (a) learning each dog’s indicators of well-being, (b) continuously monitoring for any signs of behavioral stress, and (c) educating other students on how to properly care for the dogs based on the animal’s individual temperament, personality, interests, needs, and stressors.

Connection – The *connections* that students form in the Canine Program – whether they be with shelter or companion dogs, Green Chimneys personnel, or peers – are rich and diverse. Relationships between youth and adult mentors, and youth and fellow students, are forged primarily through lessons on how to handle and interact with shelter dogs in training and socialization exercises, play, grooming, and care activities. In the process of learning and teaching these skills, and getting to know individual animals, students often become deeply bonded to the dogs. For example, a student will likely come to know or personally connect with

a dog's pre-shelter history, his or her physical and behavioral challenges, and which toys or foods he or she favors.

Moreover, dogs may become a source of comfort or solace for a student, such as in canine-assisted psychotherapy sessions or in private, less formal moments. In the case of one student heavily impacted by Tourette Syndrome, staff have noticed that his typical vocal and behavioral tics seem to subside when he is in the presence of dogs. "The dogs are able to calm his whole being," said one Green Chimneys staff member during a recent interview (M. Doherty, personal communication, March 29, 2019).

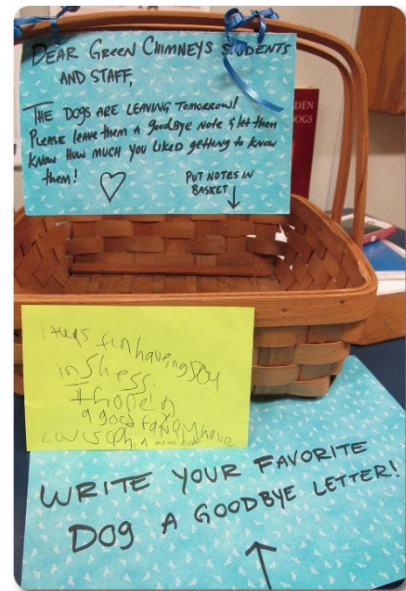


Confidence – As discussed above, students often gain specific competencies through working and connecting with dogs that may lead to increased *confidence* in their overall abilities. For students at Green Chimneys, confidence may result from seeing their shelter dog achieve a training milestone, receiving praise from their social worker regarding their knowledge and advocacy of canine well-being, demonstrating leadership when speaking with visitors about the activities of the Canine Program, or conquering any nerves related to working with a particular dog or canine breed. Likewise, students may grow even more confident when they feel trusted by Green Chimneys staff to handle the dogs on their own.

Character – Through forming relationships with shelter dogs at Green Chimneys, a student often develops a strong sense of empathy for their past, of parallel likeness with their present, and of investment in their future. As participants in the Canine Program, students are tasked with preparing dogs for a successful adoption through compassionate and consistent care, socialization, and training methods. This sense of responsibility for the dog's current and

ultimate well-being provides students with a sense of purpose, thereby aiding in their *character* development. In other words, students may be motivated to regulate their behavior during canine-assisted therapy or training sessions to ensure that dogs feel comfortable and stay focused on the task at hand. Often, students who are considered disruptive or disrespectful in the traditional classroom setting demonstrate responsible and upstanding behaviors in the Canine Program.

Caring – Canine residents and visitors of Green Chimneys are well-cared for, due in no small part to the contributions and hard work of students. This experience of *caring* for dogs by attending to their well-being also promotes students’ abilities to care for themselves and for others in their lives. In addition to ensuring that their basic needs are met (i.e., in the kennel facility), students often create deep and devoted friendships with the dogs marked by empathy, understanding, nurturance, and concern.



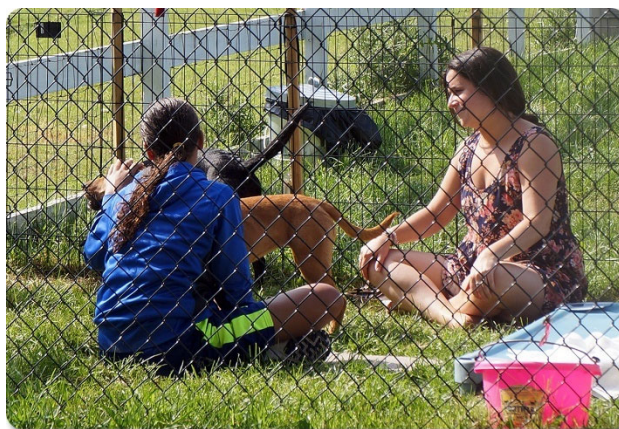
7.9 Animal-Assisted Interventions in the Canine Program

Animal-Assisted Therapies in the Canine Program

Canine-Assisted Group Psychotherapy – With the assistance of his or her personal companion dog, a trained and licensed social worker conducts group psychotherapy with residential students after school one to two times per week in the dormitory common room. Members of the dorm staff serve as “facilitators” during these 30-60 minute sessions to assist with the supervision and/or support of youth participants. The primary therapeutic approach during group sessions is Dialectical Behavior Therapy (DBT), in which dogs help students practice four main skills: (a) mindfulness techniques, (b) tolerating distress, (c) emotional regulation, and (d)

effective interpersonal communication. For example, the social worker may start the group by asking students to verbally share their observations about the dog's appearance or behavior. This exercise helps emotionally ground students to the present, encourages mindfulness, and provides them with an opportunity to effectively and respectfully communicate with other group members.

Canine-Assisted Individual Psychotherapy – Individual psychotherapy sessions incorporate a therapist's pet dog into clinical interventions aimed at helping the student reach specified treatment goals, such as improving self-confidence, forming healthy social relationships and boundaries, developing self-care habits, or learning strategies to regulate emotions and behaviors during times of stress. Notably, including a dog in therapy can help provide an accepting and motivating presence for youth with psychosocial challenges, thereby allowing them to feel safe when practicing these skills and discussing traumatic and distressing experiences (Chandler, 2017; Parish-Plass & Pfeiffer, 2019). Likewise, the facilitative role of dogs in enhancing therapist-client rapport is well-documented, as discussed previously. Individual canine-assisted psychotherapy at Green Chimneys is provided and documented by a licensed clinical social worker with appropriate training in AAI and DBT, and is based on a triangle model of service (i.e., therapist, client, and dog). The length and frequency of these sessions depend on the goals outlined in each student's individualized education program (IEP), but they typically last 37 minutes each (i.e., the length of one class session).

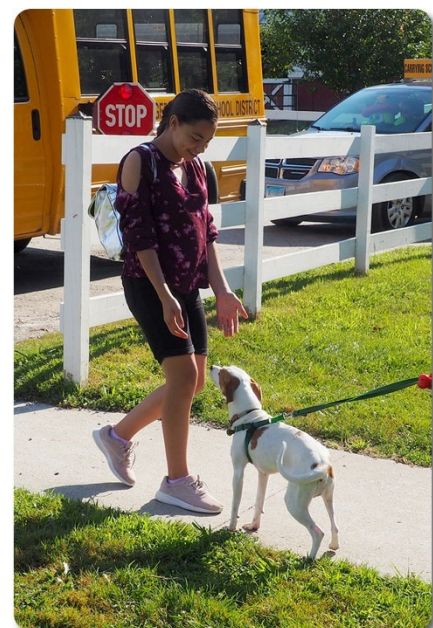


Canine-Assisted Individual Occupational Therapy – Canine-assisted occupational therapy refers to the inclusion of a dog in an established intervention to help the client reach his or her specific occupational therapy goals, such as improving fine and gross motor skills, tolerating sensory input, practicing social interactions, increasing focus and awareness, and engaging in self-care and independent living activities (Andreasen et al., 2017; Goddard & Gilmer, 2015). At Green Chimneys, OTs include their own companion dogs or resident shelter dogs in individual therapy sessions with youth to enhance IEP and treatment goal-directed activities. Such activities may include:

- *Demonstrating care for the dog’s needs (identified in 2014 as an instrumental activity of daily living by the American Occupational Therapy Association)*
 - *This may include a number of sensory-stimulating experiences that require focus, such as providing the dog with food and water, taking the dog for a walk during the session, and cleaning up after the dog if he or she defecates*
- *Throwing a ball and playing fetch with the dog, thereby increasing the student’s range of motion (Andreasen et al., 2017)*
- *Working collaboratively with other students to guide the dog through an obstacle course, which assists in the development of social, gross motor, and problem-solving skills (Winkle & Jackson, 2012)*

Animal-Assisted Activities in the Canine Program

Morning Bus Greeting – On some mornings, when students arrive at Green Chimneys by bus, they are greeted by an intern and a dog from the shelter program. The dog provides a supportive distraction for anxious students, helping to ease the transition to the school environment. Transitions of all kinds, including home to school and class to lunch, are often difficult for youth at Green Chimneys (Kaufmann, Kinoshita, & Teumer, 2019).



Dog Dorm Visit – At the end of each school day, Green Chimneys’ residential life staff will bring a shelter dog to visit students in the dorms. The purpose of this activity is to provide youth with an enriching recreational and social activity after classes, and to further help socialize the dogs in preparation for adoption. Much like the transition from home to school, staff have also observed that the familiar and comforting presence of dogs helps alleviate the stress students often experience when moving from educational to residential life programming (M. Doherty, personal communication, March 20, 2017).



After-School Club – After-School Club, also referred to as “Dog Club” by students, occurs twice a week for 60 minutes each session. This club provides designated time for youth to interact with shelter dogs on campus through such recreational activities as going on a hike together or practicing agility and scent work skills. Youth who are interested in working with dogs, and who have been identified as suitable candidates for the program, are selected to participate. Club activities are supervised by adult staff facilitators in order to ensure safe and positive interactions, and to provide support for students who may exhibit behavioral or emotional disturbances (EDs). Students who display extreme dysregulation or highly destructive behaviors, or who fail to follow directions, are typically removed from the situation until they are able to re-engage calmly and safely with the activity.

Crisis Management – In select cases, human-canine interaction may also be used to help calm Green Chimneys students who are demonstrating relatively mild dysregulation or marked signs of distress. For example, if a student becomes angry and is having difficulty regulating this

emotion in the classroom, teachers may allow him or her to take a “mental break” to visit a dog under staff or intern supervision. After spending time connecting with the dog, students often return to class noticeably more relaxed and prepared to re-engage (R. Graham, personal communication, March 21, 2017). However, if a student is demonstrating unsafe behaviors (e.g., throwing objects or gesturing at peers), alternative methods of de-escalation are used in lieu of canine interaction to support his or her emotional regulation.

Animal-Assisted Education in the Canine Program

Dog Education Class – The Dog Education Class is a required course that every student must enroll in for one academic quarter. The goal of this weekly class is to socialize shelter dogs through HAI, and to teach students how to safely approach dogs, attend to canine behavioral cues, train dogs using positive reinforcement, and understand basic canine anatomy and physiology. These classes meet once per week and are taught by the Canine Behavior Specialist/Shelter Manager and other shelter employees from Animals for Adoption.

AAIs may help support the development of self-awareness, sensitivity, and empathy in youth by teaching them to be attentive to an animal’s personality tendencies, preferences, and typical stress-related behaviors (Arluke, 2010). As such, all students are given the opportunity to participate in this enrichment activity, including those who have experienced recent behavioral challenges (provided those challenges do not pose a safety risk to the student, the dog, or to others). Depending on the specific focus of each class and other logistical factors, this group activity is held in either an enclosed indoor space (e.g., a classroom) or in an outdoor location (e.g., the onsite dog run).

Canine Career Technical Education Class – Implemented across two academic quarters, this structured, elective curriculum focuses on developing vocational and technical skills for students who have a specific interest in working in animal shelters. Facilitated by the Canine Behavior

Specialist/Shelter Manager from Animals for Adoption, classes last two academic quarters and meet twice per week for 37 minutes of practical, hands-on experience with shelter dogs. In order to participate, students must be generally high-functioning; comfortable with taking dogs in and out of the kennel; adept at placing and removing a dog's harness; diligent about observing and documenting canine behavior; knowledgeable of individual dogs' signs of stress and affiliation; and responsive if a dog gets loose or appears unwell. Each class typically consists of five students who participate in group discussions and practice specific commands with one shelter dog for the entirety of the course.



Likewise, youth learn important CTE and interpersonal skills through caring for the dog's health and well-being (e.g., teeth brushing); assessing dogs for placement; contributing to budgeting and fundraising activities; and helping to conduct intake, potential adoption, and follow-up interviews. Students receive a grade based on their participation, which is then incorporated into their IEP. These activities often lead to student excitement and gratification when they see their hard work culminate in a dog's successful adoption from the program.

Learn and Earns – Similar to other Learn and Earn activities across the Green Chimneys campus (see Section 2.7 in Chapter 2), the Canine Program provides students with an opportunity to learn vocational and animal care skills through personalized, one-on-one relationships with adult mentors. Typically, students are paired with an intern or staff member to complete such caregiving tasks as cleaning the canine facilities; feeding, watering, walking, and grooming the shelter dogs; and obedience training. The overall objectives of this Learn and

Earn Program are to teach youth the importance of responsibility and accountability while building the skills and compassion needed to properly care for dogs. Of note, an emphasis is placed on tailoring interventions to the student's needs and level of functioning. Students who participate in this program are expected to be reliably on time for their shift, and to complete a detailed timesheet to track their work activities.



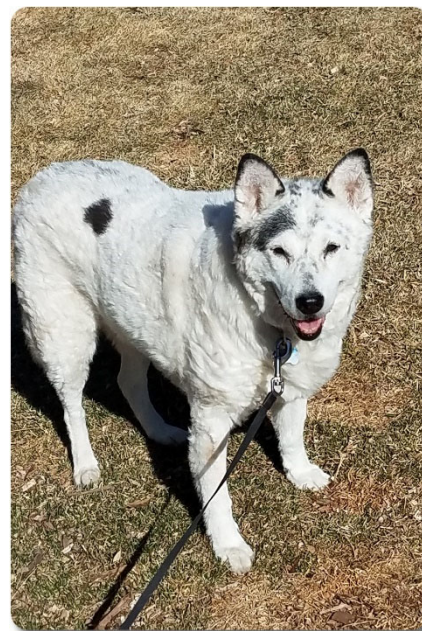
7.10 Summary

The Green Chimneys Canine Program offers students unique opportunities to build meaningful connections with dogs, primarily through training and socializing shelter dogs in preparation for adoption. On a smaller scale, students receiving psychotherapy or occupational therapy may also connect with their therapist's companion dog during sessions. Through working with and caring for these animals, as well as learning about dogs' individual stressors and ways of communicating both anxiety and comfort, children and youth are provided with an in-depth education on how to be attentive to canine well-being via responsible, empathic, mindful, and self-regulated behavior. In turn, students benefit from the process of contributing to a dog's behavioral, emotional and physical well-being, as well as his or her successful adoption from the shelter environment (in the case of shelter dog interaction), alongside trusted adult mentors. Such experiences help youth gain self-efficacy and a sense of fulfillment and may even increase the likelihood of their continued participation in altruistic activities.

Students in the Canine Program are also able to participate in a myriad of activities that highlight the importance of daily living and vocational skills, self-care, and community service. For example, through the Canine Career Technical Education Class, youth gain useful knowledge in how shelters obtain dogs, and what is needed to prepare dogs with difficult or

unknown histories for a safe and hopefully permanent adoption in the community (i.e., veterinary treatment, behavioral assessment, obedience training, socialization, and nurturance). Moreover, this class – as well as the Dog Dorm Visits, the After-School Club, the Dog Education Class, and Learn and Earns – build upon this knowledge through practical and experiential student-canine interactions focused on skill training, relationship-building, and recreational activities.

Through these various educational and therapeutic interventions, youth at Green Chimneys often draw parallels between the dog’s situation and their own. For example, both may be (a) living in unfamiliar, temporary environments or “dorms”; (b) learning new skills, including how to manage their “difficult” behaviors, follow the rules, and socially engage with others; (c) receiving a level of care and reliable attention that they have rarely experienced before; and (d) working to meet time-specific goals and expectations in order to enhance their future trajectories. As such, a kindred connection between students and dogs may materialize – one that strengthens their bond, increases a student’s investment in the dog’s success, and motivates a student to work towards his or her own goals and to practice self-care and compassion.



Furthermore, each of the therapeutic, enrichment, and educational components of Green Chimneys’ Canine Program integrate the core tenants of the PYD model. For instance, students gain competence through learning how to properly handle, train, and care for shelter dogs living on campus and via observing their individual behaviors, preferences, and stressors. Once they



master these skills through the trusted guidance of an adult mentor, they are encouraged to take initiative and to teach peers and staff what they have learned and why it is important, thereby increasing their self-confidence. The program improves connection for children and youth through the formation of strong bonds and rapport with staff, interns, fellow students and dogs, all of whom are working towards a common goal. Additionally, tasks such as feeding dogs and cleaning their living environment helps students learn important practical and life skills, encourages a commitment to caring for others, and promotes character development through empathy, responsibility, and leadership. Likewise, canine-assisted interventions and activities are utilized to promote SEL, including helping students practice self-regulation, mindfulness, responsible decision-making, relationship skills, and social and community awareness – all through the motivating and supportive friendship of dogs.

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PART III

HORTICULTURAL-BASED INTERVENTIONS AT GREEN CHIMNEYS



*My garden is my most beautiful masterpiece.
—Claude Monet, painter*

Chapter 8:

Horticultural-Based Interventions at Green Chimneys

Horticultural-based interventions (HBIs) – including horticultural therapy and therapeutic horticulture (i.e., activities and education) – are thought to provide an important foundation for enhancing positive youth development (PYD) through meaningful connections with plants and plant-rich environments. HBIs include the use of plants as a therapeutic and/or rehabilitative means of enhancing human functioning and well-being, as well as a more informal activity (i.e., garden maintenance, harvesting vegetables) to learn about environmental sustainability, personal wellness and nutrition, botany and plant anatomy, and farming practices. Recently, a growing number of studies have provided evidence linking HBIs with improvements in people’s physical and mental health, as well as their ability to self-regulate and develop positive emotional, cognitive, social, and behavioral skills.



Since 1947, gardens have been an important component of the nature-based mission and environments at Green Chimneys. However, it was not until the 1970s – the same decade that the American Horticultural Therapy Association was founded – that plants were used intentionally in therapeutic and educational interventions with students. Today, a wide variety of horticultural activities, from picking berries in the orchard to selling crops and other plant-based products at the Farm Stand to preparing meals in the kitchen using homegrown garden produce, are offered to youth across and adjacent to the Green Chimneys campus. The organization’s two primary HBI program areas are: (a) the Educational Garden and Greenhouse and (b) the Boni-Bel Farm and

Country Store (see *Green Chimneys Campus Map* on page 10 and *Green Chimneys Nature-Based Program Areas* on page 11). Both of these will be briefly described in this chapter to provide a context for Green Chimneys' overall HBI programming, and then discussed in greater depth in Chapters 9 and 10.

8.1 Summary of Selected Research

Before discussing the current HBI research and specific programming at Green Chimneys, it is important to first revisit terminology commonly used in the field. In the United States, HBIs are typically placed into one of two categories: (a) horticultural therapy or (b) therapeutic horticulture. Although these terms are quite similar, they are intended to describe two distinct processes. Horticultural therapy is defined as “the use of plants as a therapeutic medium by a trained professional to achieve a clinically defined goal” (Kam & Siu, 2010, p. 80). In the context of Green Chimneys, horticultural therapy between an individual student and his or her social worker may take place in the Greenhouse or at the nearby Boni-Bel Farm to engage the student in the intervention, and to help him or her develop responsible caregiving and/or coping skills. Conversely, therapeutic horticulture, which includes both activities and education, does not require facilitation by a clinical professional and can be described as “working with plants as a recreational [or learning] activity instead of aiming at achieving a therapeutic goal” (Kam & Siu, 2010, p. 80). Of note, horticultural education must be facilitated by an educational professional, such as a teacher or teaching assistant (TA). At Green Chimneys, both horticulture activities (e.g., participating in Garden Club activities in the Greenhouse, strolling through the Meditation Labyrinth in the Educational



A slow stroll through the Meditation Labyrinth may help a student regain focus and self-regulation.

Garden) and horticulture education (e.g., the Garden Class, vocational Learn and Earns at Boni-Bel Farm and Country Store) fall under the category of therapeutic horticulture.

Overall, HBIs at Green Chimneys are designed to create opportunities for students to develop confidence and a sense of competence as they successfully care for a garden, practice patience through hard work and delayed gratification, and learn about life processes in experiential settings that extend beyond the traditional classroom environment. HBIs may also offer a familiar and nurturing experience for youth living on campus, or encourage students to increase their tolerance threshold as they encounter potentially novel sensory experiences such as dirt, heat, various tastes and fragrances, and animal life (i.e., insects). Moreover, due to the fact that gardening and harvesting tasks often require teamwork, these programs provide an ideal setting for students to build social skills and receive positive reinforcement and recognition for working collaboratively.



Additionally, some Green Chimneys students prefer to spend their time with plants rather than with animals, making HBI a central component of their treatment and educational plans. Potential reasons for this preference vary depending upon the individual student. For example, sensory

stimuli in a quiet garden are less varied and overwhelming, or more predictable, than those at the Teaching Barn or Canine Program. Another possible advantage is that students tend to receive more individual attention from staff during HBIs than they do in animal-assisted interventions (AAIs), where the adult must attend to both student and animal needs. Finally, the settings where HBIs often occur, such as gardens, greenhouses and farms, provide an environment that is less dynamic and relationally complex. For example, to maintain safety

during AAIs, students are expected to follow certain behavioral guidelines, such as being aware of their proximity to a horse and allowing a dog to initiate contact. For students who have trouble with impulse control and with following more complex directives, indoor and outdoor gardens, open pastures, and other natural environments provide safe settings where students may become accustomed to interacting with living beings while building new skills.

Theoretical Foundations of Horticultural-Based Interventions

Various theories have been proffered to explain the human health benefits of connecting with nature, such as plants and gardens. Some postulate that we are innately drawn to life and the beauty of the natural world, while others suggest that plant-rich environments reduce stress, restore focus, and/or stimulate the senses in manageable ways.

The Biophilia Hypothesis is perhaps the most commonly referenced theory in the AAI, HBI, and nature-based fields. As discussed in Chapter 4, this theory, originated by E.O. Wilson,



asserts that humans have an “innate tendency to focus on life and life-like processes” (Wilson, 1984, p. 1), and that we often feel emotionally connected to other living beings and secure in their presence (Kellert & Wilson, 1993). When describing the depth and facets of human-nature connections, Kellert and Wilson (1993) state that “human dependence on nature extends far beyond material and physical sustenance to encompass the human craving for aesthetic, intellectual, cognitive, spiritual meaning, and satisfaction” (p. 20).

Stress Reduction Theory, developed by Ulrich (1983), contends that people have become physiologically and psychologically adapted to natural environments through human evolution

(Marcus & Sachs, 2013). Likewise, as discussed in Chapter 2, this theory proposes that nature reduces human stress by virtue of being a calming and non-taxing stimulus (Hartig, Evans, Jamner, Davis, & Garling, 2003; Hartig, Mang, & Evans, 1991; Kaplan, 1984; Ulrich, 1979; Ulrich, 1983). As such, people are often driven to seek access to natural settings when feeling stressed or anxious (Berto, 2014).

Attention Restoration Theory asserts that mental and attention fatigue decreases after spending time in nature or even viewing a picture of a natural setting (Kaplan, 1995). Excessive visual and/or auditory stimuli (i.e., noise, movement, and visual complexity) can lead to damaging levels of psychological and physiological arousal. In contrast, natural environments often reduce arousal and related stress, in part because they tend to be less complex and intense in terms of sensory stimulation (Berto, 2014; Simson & Straus, 2004). A 2016 study measured the impact of design on gardens' perceived restorative potential by comparing "formal or geometric" gardens to "informal or naturalistic" green spaces; research participants rated informal (i.e., less complex), natural-looking, and visually appealing gardens as having more restorative potential than those with a high degree of structure (Twedt, Rainey, & Proffitt, 2016, p. 88). According to Attention Restoration Theory, nature inspires "involuntary attention," rather than requiring "directed attention," and creates experiences of "soft fascination" or an "effortless mode of attention" with its elements (Joye & Dewitte, 2018, p. 4). Overall, it is theorized that restoration occurs when stimulus and sensory overload are reduced and attentional capacity is restored through exposure to nature, such as plants and plant-rich environments.

Psychosocial and Behavioral Benefits of Horticultural-Based Interventions

At present, research suggests a number of benefits associated with HBI for children and adults alike (see Chapter 2 for a broad overview). Cipriani and colleagues (2017) conducted the most recent systematic review of horticultural therapy provided in both inpatient and outpatient settings for adults with a wide range of mental health conditions, including dementia, major

depressive disorder, and substance dependence. Because the majority of HBI research has focused on older adults, the average age of participants in these studies was 73 years; however, several studies in this review included adults as young as 18 (Cipriani et al., 2017). The authors selected 14 rigorously designed studies eligible for their review; five of these were randomized controlled trials. This literature review focused specifically on horticultural therapy (as opposed to therapeutic horticulture), with a goal of providing practitioners with valuable information regarding its applications in clinical settings to promote client health, wellness, and quality of life (Cipriani et al., 2017). See Table 8.1.1 for an overview of key research findings regarding the psychosocial and behavioral impacts of HBIs.

Table 8.1.1. Psychosocial and Behavioral Benefits of HBIs

Finding	Population	Source
<i>Improved affect and engagement</i>	Older populations with dementia	Gigliotti & Jarrott, 2005; Gigliotti, Jarrott, & Yorgason, 2004; Jarrott & Gigliotti, 2010
<i>Improved social behaviors and interpersonal relationships</i>	Adults with chronic schizophrenia	Son, Um, Kim, Song, & Kwack, 2004
<i>Improved stress, coping, and symptoms of agitation</i>	Adults with psychiatric illness or dementia	Kam & Siu, 2008; Lee & Kim, 2010
<i>Improved self-esteem and symptoms of depression and anxiety</i>	Seniors and younger adults with chronic schizophrenia	Mooney & Milstein, 1994; Son et al., 2004
<i>Improved psychological well-being</i>	Older adults in long-term care facilities or with chronic schizophrenia	Barnicle & Stoelzle Midden, 2003; Mooney & Milstein, 1994
<i>Improved cognitive function</i>	Adults with dementia	Hewitt, Watts, Hussey, Power, & Williams, 2013; Lee & Kim, 2010
<i>Improved sleep and rest</i>	Older adults with dementia	Lee & Kim, 2010

The work of Cipriani and colleagues (2017) expands upon a previous review of the literature by Clatworthy, Hinds, and Camic (2013), which reported a growing trend in the use of gardening and other HBIs among adults experiencing mental health difficulties. Additionally, findings

from each of the 10 studies in this review suggest positive benefits of gardening when used by adults as a mental health intervention, including reduced symptoms of anxiety and depression (Clatworthy et al., 2013). However, none of the published studies in this review utilized a randomized controlled trial study design.



While the above research findings are promising and lend support to the use of gardening as a mental health intervention for adult clients, relatively few studies have sought to measure the impact of HBIs on child and youth outcomes. One such study implemented an after-school therapeutic

horticulture program for young students from a special education classroom (Kim, Park, Song, & Son, 2012). Twelve children enrolled in first, second, or third grade participated in the program for six months (once per week for 40 minutes per session), while a control group of 12 students did not participate in any after-school program (Kim et al., 2012). Intervention activities included simple gardening work, as well as indoor plant-based activities such as making a flower basket and creating a fan using pressed flowers (Kim et al., 2012). Findings indicate that children in the therapeutic horticulture group had significant improvements in their levels of assertion, self-control, cooperation and responsibility, as based on teacher and parent survey data (Kim et al., 2012).

Select studies with older children and youth also suggest a beneficial role of horticulture in mental and behavioral health interventions. For example, through interviews with 19 participants of a gardening program in a juvenile rehabilitation center, researchers (Twill, Purvis, & Norris, 2011) found that youth viewed their gardening experiences (i.e., planting seeds and tending to crops) as positive, and that the program promoted positive self-concepts and

helped participants regulate their emotions and behavior. Likewise, a study of youth aged 9-15 years with behavioral and social-emotional difficulties found that participating in the six-month design of a green space for their school (with the support of two horticulturists and a therapist) was associated with improved mental and emotional well-being among study participants (Chiumento et al.,



Some students at Green Chimneys prefer to work in gardens, rather than with animals, as a part of their treatment plan. Often, they feel successful when they see something they have planted and tended with their own hands grow and flourish.

2018). However, each of the reviewed studies had a small sample size, and either had no control groups or low-quality controls in which the comparison groups received no intervention. Therefore, although initial findings are promising, more rigorous research is needed in the field, particularly studies that focus on the impact of HBIs for children and youth with psychosocial challenges and/or special education needs.

8.2 Certifying Bodies

United States Department of Agriculture (USDA) – The USDA completes annual inspections of all garden and greenhouse areas at Green Chimneys, with a focus on safety considerations. During these inspections, evaluators ensure that all chemicals, garden tools, and machine equipment are properly stored and labeled, and that all operators have received adequate training.

New York State Department of Agriculture and Markets – The Boni-Bel Farm and Country Store is inspected annually by the state in accordance with New York State’s Department of Agriculture and Markets (2019). When conducting inspections, the Department examines the farm’s egg harvesting and storage practices, ensuring that eggs are safely and appropriately handled and stored at the appropriate temperature for sale.

8.3 Community Engagement Through Horticultural-Based Interventions at Green Chimneys

As with the AAI Program (i.e., the Teaching Barn), Green Chimneys regularly welcomes members of the community and other constituents to campus to enjoy and take part in therapeutic horticulture activities at the Educational Garden, Greenhouse, and Boni-Bel Farm. Various programs and spaces are made available to the public to promote learning about the benefits of plants and the natural environment, and to support a strong relationship with the community.

Cornell Cooperative Extension – The Cornell Cooperative Extension, based in Ithaca, NY, is dedicated to disseminating agricultural and environmental research to community members in



order to “enhance their lives and well-being” (Cornell Cooperative Extension, 2015, p. 2). Green Chimneys’ Garden staff often attend workshops and seminars at the Cornell Cooperative Extension branch in Brewster to learn about horticulture practices that they may implement on campus, such as how to compost or care for certain plants. Staff also purchase many campus plants from the Cornell Cooperative Extension’s annual garden sale, and regularly consult with the Extension’s staff on horticultural practices or concerns.

Organic Farm Stand – At the community supported agriculture stand, Green Chimneys staff and students sell fresh, organic produce and other local food products (e.g., maple sugar and syrup, honey, chicken eggs) that they grow, harvest, and/or raise at Boni-Bel Farm. During harvest season, it is not unusual for the Farm Stand to serve dozens of people from the community in a single day. Over the years, many visitors have shared that Boni-Bel Farm is an important part of their experience in the community, and that they enjoy interacting with staff and students while onsite.



Farm Tours – Because of its beautiful natural landscape and exceptional AAI, HBI, and natural environment interaction (NEI) programming, Green Chimneys is a popular destination for tours and site visits from the general public and members of the local community. On Saturdays, groups of up to five visitors are allowed to experience free, self-guided walks around campus. Larger groups are asked to schedule guided tours (offered on Saturdays from mid-April to mid-November) and to pay a nominal or sliding scale fee. On Sundays, community members are welcome to campus to visit and explore the Educational Garden, including its Meditative Labyrinth, and Tom’s Trail/the Campus Forest. To ensure the health and well-being of Green Chimneys’ resident animals and gardens, the size and number of tour groups and individual visitors per day are typically kept to a minimum; weekend hours are also currently restricted from 10am to 3pm (Green Chimneys, 2019).

Local Partnerships – Green Chimneys has a number of long-standing and mutually beneficial partnerships with organizations at the state and local level. For several consecutive years,

businesses such as KeyBank and Morgan Stanley have generously volunteered their time to help maintain the Garden grounds and greenhouse facility on designated Corporate Volunteer Days. Additionally, some individuals volunteer at Boni-Bel Farm to earn court-mandated community service hours. The number of volunteers varies month to month but tends to increase during the growing season (i.e., April through September).

8.4 Summary

Through participation in HBIs and garden care activities, youth at Green Chimneys are given the opportunity to grow and connect with plants alongside adult staff, fellow students, and members of the community. Such experiences, whether novel or familiar, can stimulate the senses without overload; build self-esteem and competence; alleviate depression and anxiety; improve social, communication, and motor skills; promote responsibility and the value of hard work; increase knowledge about nutrition, healthy eating, and meal preparation; and promote respect for the natural environment. The definitions of therapy, activity, and education (as outlined in Chapter 1) apply to the three distinct HBI program areas which will be described in detail in Chapter 9 (Educational Garden and Greenhouse) and Chapter 10 (Boni-Bel Farm). For instance, when working in the Educational Garden to facilitate student progress toward a specific treatment goal (e.g., improved emotional self-regulation or increased confidence), the intervention is considered horticultural therapy. Likewise, teaching a student about the basics of bee conservation and honey production through adult mentorship at Boni-Bel Farm is primarily considered an educational activity or therapeutic horticulture. Figure 8.4.1 (opposite page) provides an overview of the HBIs presented in the following two chapters.



Figure 8.4.1. Green Chimneys' Horticultural-Based Interventions

Green Chimneys Horticultural-Based Interventions		
	Educational Garden & Greenhouse	Boni-Bel Farm
Horticultural Therapy [HT]	Individual Horticultural Therapy	Individual Horticultural Therapy (rare)
Horticultural Activity [HA]	Garden Club Meditation Labyrinth Sensory Mud Kitchen Garden Visits	Plant Care Maple Sugaring Farm Stand and Country Store
Horticultural Education [HE]	Learn and Earns Garden Class	Learn and Earns Honey Production Career Technical Education Farm Group

8.5 References

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Chapter 9: Educational Garden and Greenhouse



Time spent gardening and caring for plants, herbs, vegetables, fruits, and flowers is thought to enhance youths' overall well-being, including their physical, motor, cognitive, social, and emotional development. Gardens and greenhouses – such as those in schools, communities, and urban settings – offer a wealth of hands-on educational and therapeutic opportunities, and may inspire healthier eating habits, physical activity, and environmental responsibility. Likewise, these spaces often provide a calming and grounding backdrop where students can contribute to the cultivation and maintenance of plant life while learning scientific concepts and interacting with insects and/or other wildlife in a natural setting. The Educational Garden and Greenhouse represent key components of the horticultural-based intervention (HBI) programming at Green Chimneys, and ideal environments to encourage social-emotional learning (SEL) and Positive Youth Development (PYD).

9.1 Summary of Selected Research

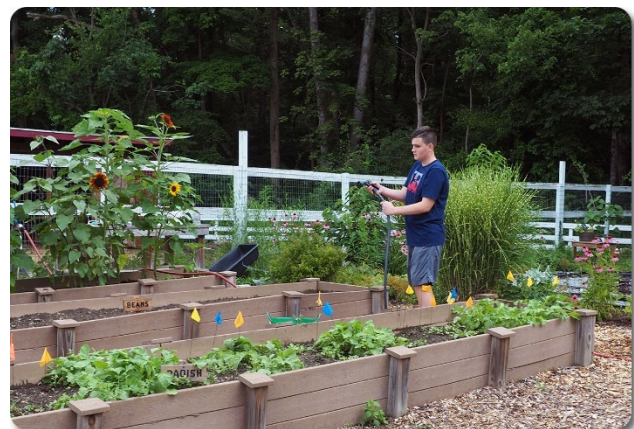
While research regarding the impacts of horticultural therapy and therapeutic horticulture (see Chapter 8 for definitions of these two terms) on youth outcomes in clinical settings is limited, results from systematic reviews and other peer-reviewed literature suggest students often



experience social, emotional, physical, and cognitive benefits after participating in gardening projects at school (Baker, Waliczek, & Zajicek, 2015; Blair, 2009; Chiumento et al., 2018; Hambridge, 2017; Igarashi, Aga, Ikei, Namekawa, & Miyazaki, 2015; Kim, Park, Song, & Son, 2012; Ohly et

al., 2016). In one recent systematic review, Ohly and colleagues (2016) summarized the findings of 40 studies (21 quantitative, 16 qualitative, and 3 mixed methods design) examining the physical, mental, and/or emotional health outcomes and quality of life indicators among youth exposed to school gardens. One randomized controlled trial from this review studied PreK-12 grade students across 12 urban, suburban, and rural schools (Wells, Myers, & Henderson, 2014). Schools in the intervention group received a 4' x 8' garden bed for each class, access to age-appropriate gardening curricula, guidance on planning and sustaining a school garden program, and resources on maintaining food safety in the garden (Wells et al., 2014). Schools in the waitlist control group did not have a school garden or access to gardening curricula or resources.

Quantitative data indicate that students who attended a school that received the garden intervention ($n = 2,148$) experienced a significant increase in moderate physical activity and were less sedentary over time as compared to students at schools in the control group ($n = 2,790$); students without school gardens also did not experience significant changes in physical activity over the study period (Wells et al., 2014). Measurements included student self-reports, the researchers' direct



observations of student activity levels, and the use of accelerometry trackers (Wells et al., 2014). Although this study by Wells et al. (2014) included a large, randomized sample and multiple sites, Ohly and colleagues (2016) note that most of the quantitative research they identified for their systematic review was lacking in overall rigor.

In contrast, the qualitative studies reviewed by Ohly et al. (2016) were generally of higher quality, and documented a range of health and well-being benefits associated with school gardening activities. For example, several researchers (Ahmed, Oshiro, Loharuka, & Novotny, 2011; Bowker & Tearle, 2007; Cutter-Mackenzie, 2009; Miller, 2007; Ming Wei, 2012; Passy, Morris, & Reed, 2010; Somerset, Ball, Flett, & Geissman, 2005; Viola, 2006) found that students with access to school gardens experienced feelings of achievement and satisfaction from nurturing plants and helping them grow. Other noted benefits of school garden programs for students included increased confidence and self-esteem (Bowker & Tearle, 2007; Lakin & Littledyke, 2008; Miller, 2007; Ming Wei, 2012; Passy et al., 2010; Somerset et al., 2005; Viola, 2006); reduced stress through slowing down in the garden (Block et al., 2012; Cutter-Mackenzie, 2009; Ming Wei, 2012); enhanced social well-being through relationship building with peers and teachers (Bowker & Tearle, 2007; Miller, 2007; Ming, 2012; Passy et al., 2010; Somerset et al., 2005; Viola, 2006); and improved experiences with completing schoolwork (Bowker & Tearle, 2007; Ming, 2012; Passy et al., 2010; Somerset et al., 2005).



In one study from the 2016 review by Ohly and colleagues, Chawla, Keena, Pevec, and Stanley (2014) conducted a qualitative study across six sites that explored the role of green spaces in schools as related to fostering resiliency and reducing stress in children and youth between 6

and 19 years of age ($n = 169$). Through student behavioral observations, interviews and surveys, Chawla et al. (2014) found that the presence of natural spaces and gardening programs in schools was perceived by students as having a significant impact in increasing their positive moods, as well as in reducing their stress, anger, inattention, and problem behaviors. Moreover, several youth who participated in interviews referred to the garden as a “sanctuary,” and described feeling “refreshed” and having a sense of “positive energy” after being given the opportunity to work, slow down, meditate, and focus on one thing at a time in the garden (Chawla et al., 2014, p. 10). These promising findings are consistent with other research that suggests access to nature in neighborhoods and home environments reduces symptoms of Attention Deficit Hyperactivity Disorder (ADHD; Faber Taylor & Kuo, 2009; Faber Taylor, Kuo, & Sullivan, 2001; Kuo & Faber Taylor, 2004); facilitates stress management and coping (Park, Song, Oh, Miyazaki, & Son, 2017; Wells & Evans, 2003); and decreases rates of depression among children and youth (Maas et al., 2009; Park et al., 2017).



In addition to providing a number of social, emotional and behavioral benefits, the experiential nature of gardening (a) connects students to the natural world through learning about ecology and environmental sustainability (Cutcliff & Travale, 2016; Hambridge, 2017); (b) promotes healthy living, physical activity, and informed eating habits (Ahmed, et al., 2011; Lakin & Littleddyke, 2008; Passy et al., 2010; Somerset et al., 2005; Viola, 2006); and (c) improves cognition via strengthening critical thinking and problem-solving skills (Haubenhofner, Elings, Hassink, & Hine, 2010; Monroe, 2015). A 2009 evaluative review on the effects of school gardening programs for youth (Blair, 2009) detailed significantly positive outcomes in the areas of science test scores (Dirks & Orvis, 2005; Klemmer, Waliczek, & Zajicek, 2005; Mabie & Baker, 1996;

Smith & Motsenbocker, 2005), preferences for healthy foods and snacks (Lineberger & Zajicek, 2000; McAleese & Rankin, 2007; Morris, Neustadter, & Zidenberg-Cherr, 2001; Morris & Zidenberg-Cherr, 2002), and improved attitudes towards school and the natural environment (Alexander, North, & Hendren, 1995; Faddegon, 2005; Skelly & Zajicek, 1998; Thorp & Townsend, 2001).

Given these promising research findings, there has been an increasing international trend to implement gardening and garden environments into PreK-12 schools and academic curricula (Haubehofer et al., 2010; Hazzard, Moreno, Beall, & Zidenberg-Cherr, 2011). In 1995, California's State Legislature approved a small start-up fund for schools interested in planting

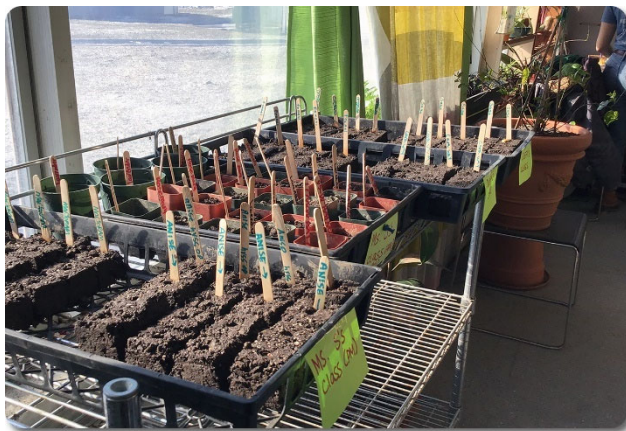


During strawberry picking season, students reap the sweet rewards of their hard work, patience, and care – skills they learn through participating in horticultural-based interventions.

instructional gardens, resulting in 2,000 new school gardens across the state (Ozer, 2007). Of note, surveys from over 4,000 California public school principals found that 89% “viewed academic enhancement as the purpose of the garden in their school” (Ozer, 2007, p. 848). This study also indicated that educators value the experiential, hands-on learning that gardening provides, and saw academic development in their students during and following therapeutic horticulture activities (Ozer, 2007). Of note, this California legislation still stands and, as of 2015, over 7,000 school gardens funded through federal and local grants exist nationwide (Farm to School Census, 2015).

9.2 Overview of the Educational Garden and Greenhouse

Over 30 years ago, the current Educational Garden and Greenhouse joined Green Chimneys as key HBI program areas. Prior to that time, a garden space existed on the main campus for many years, but was moved to Boni-Bel Farm during the construction of the new school building. Once this capital project was completed, the Garden was moved back to the main campus, and became what is now known as the Educational Garden (Green Chimneys, 2014). The permanent addition of a designated garden and greenhouse on the main campus provided easier student access to horticultural programming during the school day; allowed children to more readily view and track their work in the Garden, as well as show their progress to others; and gave staff the opportunity to offer therapeutic and educational HBIs with less of an emphasis on food production and vocational training (i.e., the main foci of Boni-Bel Farm). Interventions in the Garden and Greenhouse strive to meet both the treatment and educational goals of individual students. For example, the Garden may serve as a calming space for a child who is dysregulated, experiencing sensory overload, or struggling to feel safe in therapy. Horticultural therapy also offers engaging ways for students to care for, and connect with, other living beings while gaining confidence through practicing motor, problem-solving, and daily living skills. Likewise, educational instruction in the Garden and Greenhouse aims to teach students about



the cyclical life process of plants and the various responsibilities of gardening year-round (i.e., from seed to harvest); the real-world and experiential applications of classroom science lessons (e.g., plant anatomy, botany, photosynthesis); and the importance of agriculture and environmental advocacy.

While the Educational Garden and Greenhouse are located in separate areas on campus, they share the same programmatic goals, activities, and staff. The Greenhouse is typically used when the weather is colder (i.e., from September through April and during rainy days in warmer months), while the Educational Garden is most popular during the growing season of April/May through September. HBIs offered in these two spaces tend to build off of each other depending on the season and cyclical nature of gardens. During the spring, summer and fall, students spend most of their time in the Educational Garden planting, maintaining, and harvesting crops, with winter programs devoted to lessons on plant science, seed propagation, and gardening techniques in the Greenhouse (Green Chimneys, 2019). Interventions are modified to fit the varied conditions of each setting, such as differences in space, climate, temperature, soil, plant types, and use of containers (or lack thereof).

9.3 General Policies, Practices, and Procedures

Therapists and teachers at Green Chimneys may reserve the Garden and Greenhouse and their resources to incorporate horticultural therapy and/or therapeutic horticulture into their work with students. As such, youths' open access to the Educational Garden and Greenhouse is somewhat limited due to regularly scheduled academic and garden classes. The Greenhouse is also generally locked when staff are not present, and the Educational Garden maintains a fence with a locked entrance. Due to the possibility that children who are dysregulated may pick up tools that could pose harm to themselves or others, staff are usually present when students are in the Garden and Greenhouse to ensure safety and provide supportive supervision.

9.4 Staffing

Below are descriptions of the HBI staff and interns who work primarily at the Educational Garden and Greenhouse. The two main staff members in these program areas have backgrounds in teaching and/or therapeutic horticulture, and work with interns to provide HBI

programming to students on campus. As needed, staff and interns also assist with programming at Boni-Bel Farm.

Lead Garden Teacher/Horticultural Therapist – This position is led by an individual with a teaching license in the state of New York and a background in therapeutic horticulture; Green Chimneys does not require this person to be a Registered Horticultural Therapist or Recreational Therapist, although it is preferred. Primarily, this individual leads Garden Classes (20-25 per week) and Garden Club (1 after-school program per day; see Section 9.9 for more information on these activities) and directs the management of the Garden, the Garden Teaching Assistant (TA), and Garden Interns. Additionally, he or she oversees 2-3 Learn and Earns with students each week.

Garden Teaching Assistant – To qualify for this position, one must hold an Associate Degree (or higher) and a New York State Teaching Assistant Certificate. The Garden TA is responsible for helping to care for the Educational Garden and Greenhouse, as well as supporting the Lead Garden Teacher/Horticultural Therapist in facilitating Garden Club activities and Garden Classes during and after the school day. This person also provides mentorship to Garden Interns and may lead or assist with Learn and Earns during the week.



Garden Interns – Garden internships in the HBI Program are filled by individuals who have, at a minimum, a high school diploma or equivalent. Interns primarily mentor Green Chimneys students (i.e., 4-5 students per day) during Garden Class and Learn and Earn activities in the Educational Garden

and Greenhouse; on occasion, these interns also go to Boni-Bel Farm to learn and/or assist with tasks. Garden Interns may help students make beeswax candles, mix organic lotions, dry culinary herbs, and prepare chicken eggs freshly laid at Boni-Bel for sale at the Country Store (Green Chimneys, 2019). Garden Interns also assist with overall garden care and maintenance.

9.5 Facilities and Tangible Resources

The Educational Garden – Located near the school and horse pasture, the Educational Garden is 200' x 70' (roughly an acre-and-a-half), and includes flowers, vegetables (including ornamental vegetables), herbs, and berries. As previously mentioned, the perimeter is fenced in and locked after hours or when staff are not present. Within the Garden itself are several long, raised beds, as well as smaller 3' x 3' raised beds for individual use; a berry patch; a picnic bench and gazebo; a solar dehydrator; a sensory “mud kitchen;” an arbor under which people enter; and trellises to elevate gourds from the ground while they grow. The raised beds hold annual and perennial vegetables, herbs, and flowers during the growing season, while the Garden gazebo is used by staff, interns, and students in times of inclement weather (i.e., excessive heat, rain, or humid periods). Additionally, there is a labyrinth in the Garden plot to encourage meditation, mindfulness, problem-solving, and motor skill development.

The Greenhouse – The Greenhouse was built to provide the HBI Program with a cold-weather structure that enables programming to continue in the fall, winter, and early spring. It is mainly used for Garden Classes, Garden Club meetings, and Learn and Earn activities. Attached to the Occupational Therapy Building, the Greenhouse is adjacent to both the Teaching Barn and the school (see *Green Chimneys Campus Map* on page 10). This 600-square-foot space houses plants, shelving units, tables, chairs, books, and teaching materials. A cultivated area lines the front of the structure, which is used for planting tea herbs. The Greenhouse receives varied amounts of direct sunlight and, thus, plants are arranged according to their individual exposure

needs regarding light and temperature. The teaching space within the Greenhouse is kept at temperatures well-suited for human comfort, while the plant area's temperature tends to be warmer in order to provide optimal growing conditions.

9.6 Plants at the Educational Garden and Greenhouse

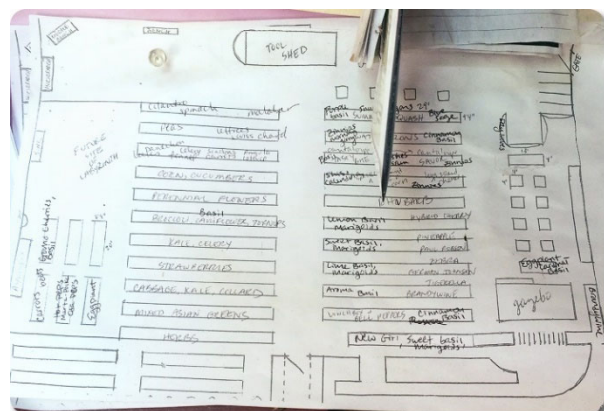
The following tables list the variety of plants typically grown in the Educational Garden (Table 9.6.1) and Greenhouse (including the Herbal Tea Garden near the entrance of the structure; Table 9.6.2).

Table 9.6.1. Plants at the Educational Garden

<i>Fruits & Vegetables</i>		<i>Herbs</i>		<i>Flowers</i>
Pole Beans	Blackberries	Cinnamon basil	Amaranth	Morning Glory
Scarlet Runner Beans	Blueberries	Large leaf basil	Bachelor's Buttons	Nasturtium
Beets	Gooseberries	Lemon basil	Butterfly Weed	Pawpaw Trees
Rainbow Carrots	Raspberries	Purple basil	Calendula	Russian Sage
Short Carrots	Golden Raspberries	Catmint	Clematis	Multi-colored Snapdragons
Corn	Strawberries	Catnip	Coleus	Autumn Beauty Sunflowers
Cucumbers	Grapes	Chives	Coreopsis	Mammoth Sunflowers
Lemon Cucumbers	Peach Trees	Dill	Hibiscus	Red Sun Sunflowers
Rainbow Swiss Chard	Jerusalem Artichoke	Lavender	Hollyhock	Teddy Bear Sunflowers
Kale	Rhubarb	Mint	Hyacinth	Velvet Queen Sunflowers
Lettuce	Watermelon	Pineapple Mint	Lupine	Wisteria
Spinach	Bumblee Tomatoes	Oregano	Marigold	Zinnias
Pumpkins	Plum Tomatoes	Sage	Montauk Daisies	
Squash/Gourds	Slicing Tomatoes	Thyme		
Radishes	Sungold Cherry Tomatoes			
French Breakfast Radishes	Peppers			
Icicle Radishes	Garlic			

Table 9.6.2. Plants at the Greenhouse and Herbal Tea Garden

Greenhouse		Herbal Tea Garden		
Abutilon Chinese Lantern Plant	Jade Plants	Purple Heart (Purple Plant)	Anise Hyssop	Chamomile
Aloe	Kalanchoe	Sedum Burrito	Bee Balm	Lemon Balm
Avocado Tree	Madagascar Dragon Tree	Speckled Spur Flower	Calendula	Milkweed (for Butterflies)
Cacti and Succulents	Mother of Thousands	Spider Plants	Catmint	Sage
Echeveria	Orchids	Umbrella Tree	Chocolate Mint	Yarrow
Geraniums	Passion Fruit Vine	Vanilla Bean Vine		
Grapefruit Tree	Peace Lily	ZZ Plants		
Vegetable Spring Starters for Educational Garden (broccoli, spinach, tomatoes, etc.)				



In the Greenhouse, winter is the best time for students to practice taking care of more delicate plants, like the succulents pictured on the left. It is also a prime opportunity to make plans for next spring's garden (pictured on the right).

9.7 Ethical Considerations for Environmental Impact, Sustainability, and Animal Life

In an effort to limit negative impacts on local insect populations and neighboring fauna and flora, Green Chimneys uses only organic products for plant cultivation in the Educational Garden and Greenhouse. This practice avoids the introduction of toxic chemicals into the ecosystem, thereby supporting the safety of children, adults, and other animals who come into direct contact with the garden environment. Primarily, the Educational Garden and Greenhouse are designed to be sensory-rich, movement-based, and experiential environments where

students can observe and otherwise interact with a diversity of plants and/or wildlife animals (e.g., worms, butterflies, bees, and other insects). Above all, Green Chimneys encourages respectful and humane interactions between students and all living beings while in these program areas.

Likewise, an established compost system is used at Green Chimneys to recycle food waste, weeded plant material, and unused or leftover crops to enrich and replenish the garden soil without the use of chemical fertilizers. This and other processes at Green Chimneys teaches students about the value of environmental sustainability, and highlights tangible ways that they can care and advocate for plants and the natural world.

9.8 The Educational Garden and Greenhouse as Contexts for Positive Youth Development

The Big Three in the Educational Garden and Greenhouse

Positive and sustained relationships between youth and adults – HBI programming in the Educational Garden and Greenhouse offer key contexts for youth to develop meaningful relationships, whether they be connections with plants, animals, fellow students, or Garden staff and interns. While in the Garden, most children are calm and emotionally regulated with a positive affect, which supports their ability to interact well with others and to develop social relationships. Students are largely successful in these settings and adult mentors regularly



express positive regard by recognizing their growth and delivering praise for a job well done. In comparison to AAIs where staff must attend to the needs of both the student and the animal(s), HBIs also may allow a staff member to provide more focused, one-on-one attention to the student he or she is

working with. Furthermore, as many gardening projects require collaborative learning and teamwork, youth spend much of their time working with peers and staff to accomplish tasks together.

Activities that build important life skills – Through planting, maintenance, and harvesting tasks in the Educational Garden and Greenhouse, students at Green Chimneys develop critical life (and lifelong) skills while reaping the benefits of spending time in the natural environment. Garden work motivates and inspires; improves self-esteem; fosters physical activity, leisure, and social skills; promotes the importance of responsibility and commitment to others; and teaches patience and self-sufficiency by showing students how to contribute to the steady growth of their own healthy and garden fresh food. Most Green Chimneys students respond well to garden activities, likely because they experience a sense of purpose in that environment. The Lead Garden Teacher/Horticultural Therapist works to have a plant or crop ready for harvest each week during the growing season so that students can regularly and reliably experience the fruits of their labor.



Students learn that hard work makes a tangible and rewarding impact in the Educational Garden and Greenhouse.

Opportunities for youth to use life skills as participants in, and leaders of, valued community activities – Students who have a keen interest in gardening often participate in weekly Learn and Earns and may receive approval to work in the Garden outside of class time. This and other activities represent opportunities for students to take ownership over certain projects, greenhouse plants, and composting. Additionally, because much of the Garden’s produce is eaten by students in the Garden or by resident animals (with any waste composted for re-use),

the children can connect their work at Green Chimneys to environmental sustainability and to the food served and/or enjoyed by the community in which they live. This highlights the value of caring for themselves, other people, animals, and the planet as a whole.

The Five Cs of PYD in the Educational Garden and Greenhouse

Competence – A student’s sense of *competence* can grow swiftly and steadily in the Educational Garden and Greenhouse due to the simple but rewarding nature of tending to plants. For example, helping a vine of tomatoes grow from seed and using the mature fruit of their labor to make a healthy salad for staff and peers allows students to feel capable, self-sufficient, and proud of their commitment, knowledge, hard work, and accomplishments. Moreover, students who demonstrate responsibility and mastery in the Garden and Greenhouse are often trusted by staff to perform or lead future gardening tasks with little to no assistance.

Connection – Because the Educational Garden and Greenhouse are located onsite, children and youth at Green Chimneys are able to create an easily accessible sense of place and *connection* to plant life on campus. Furthermore, each student can attend at least one class per week in the



Garden or Greenhouse, thereby supporting his or her ability to foster these important bonds. While engaged in HBI programming, students may experience the tangible benefits of watching “their” plants grow and connecting this progress to their own personal growth at school and/or in therapy.

In addition, students who have been enrolled at Green Chimneys for multiple years can mark the passing of time and their accomplishments by looking for the lavender perennials they planted to reappear each spring or by measuring the annual growth of a nearby tree. Staff also regularly make connections for students between their collective hard work in the Garden or Greenhouse and the beauty and well-being of the plants they care for. As gardening is largely a team effort at Green Chimneys, caring for plants alongside peers or one-on-one with staff helps foster meaningful social connections for HBI participants. For example, sharing responsibility for the planting, cultivation, and harvesting of vegetables provides children with a shared experience that not only bolsters individual confidence, but also strengthens peer connections.



Confidence – Caring for other living beings successfully and independently builds *confidence* among students and may encourage youth to engage in their own self-care. Through working hard in the Garden, children who are often “service receivers” become “service providers.” Likewise, youth may feel a sense of identity, purpose, and self-assurance through knowing that they are ultimately responsible for the well-being and survival of plants and crops, as suggested by one Green Chimneys staff member:

Animals are instant gratification, but in the Garden, [students] gain confidence from being able to take care of a plant and [knowing] that they kept it alive. A lot of students take plants to the dorm or home with them. They take ownership of taking care of that plant and making sure it stays alive. It’s a daily reminder that they are being successful. With those little reminders, whether it be the plant they took home or the one they planted in the Garden, or the plant they’ve watered every week ... it’s very evident to them that they are keeping something alive (A. Frost, personal communication, March 28, 2018).

Moreover, students often request time in these two program areas to show staff and/or visiting family members the considerable progress and contributions they have made through gardening.

Character – Gardens require constant planning, thoughtful attention, and the physical labor of people in order to thrive. Students who put time and effort into their garden projects are likely to experience a tangible and positive impact, and to feel secure in the knowledge that they did quality work. Likewise, young gardeners learn to responsibly manage disappointments and setbacks (e.g., a plant dying) by considering what actions they can take to prevent a similar outcome from happening in the future (e.g., regular watering and pruning). These experiences help build *character* by teaching students the inherent value of hard work, of committing to a task no matter the challenges, and of contributing to the well-being and longevity of other living beings.



Caring – By conscientiously tending to the Garden and its inhabitants, students demonstrate *caring* for plants, insects, and for the people and other animals who will eventually eat the vegetables, fruit, herbs, and/or flowers that are grown there. In addition, showing empathy and tenderness toward a plant, as opposed to a human or non-human animal, may feel safer for some students due to a greater degree of relational distance. Students can also care for plants, animals, and the greater environment by using organic materials and compost to create an ecosystem free of toxic or harmful agents. Moreover, spending quality time in the Garden or

Greenhouse is an important way for students at Green Chimneys to practice mindfulness and self-care, especially during periods of stress and sensory overload.

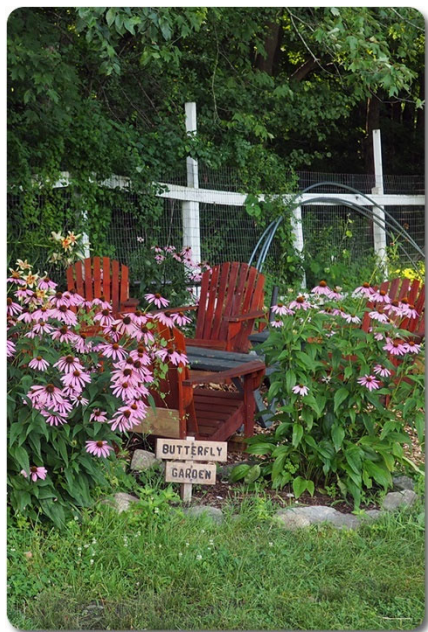
9.9 Horticultural-Based Interventions in the Educational Garden and Greenhouse

The Educational Garden and Greenhouse were created with the recognition that people-plant interactions and plant-rich environments are beneficial for learning and for mental health.

Interventions and activities in the Greenhouse vary seasonally and may include seed propagation and plant care, plant anatomy and science lessons, and plant-based crafts. Likewise, the Educational Garden setting encourages genuine connections between students and nature, and allows for purposeful multisensory integration, emotional regulation, and physical activity in a soothing, outdoor learning environment.

Horticultural Therapy in the Educational Garden and Greenhouse

Individual Horticultural Therapy – When Green Chimneys’ licensed clinical social workers and occupational therapists (OTs) wish to use plants or HBI in therapy with youth, they often partner with the Lead Garden Teacher/Horticultural Therapist or Garden TA to complete a



session as a group of three using the diamond model (i.e., including the social worker/OT, teacher/TA, client, and garden setting/plant). The teacher or TA leads the therapeutic horticulture activity, while the social worker or OT partners with the client to connect the activity to his or her treatment goals. Clinicians who are comfortable utilizing the Greenhouse or Garden independently, or who have prior horticultural experience, typically use the triangle model (i.e., social worker/OT, client, and garden setting/plant). Garden staff also offer training to social workers and OTs at

least once a year on incorporating HBIs into their sessions with clients. Due to the large number of pre-scheduled activities that occur in these program areas, social workers and OTs often schedule therapy sessions with Garden staff in advance.

In both models, horticultural therapy sessions are guided by the social worker or OT, according to the client's individual treatment goals. Likewise, a client's participation in HBI is often based on his or her interest and/or prior experience in garden environments. Therapeutic sessions with plants in garden environments can be a source of calm, positive sensory stimulation, helpful distraction, restored attention, and rapport between therapists and clients. Depending on the session activity and setting, horticultural therapy may also build a client's self-esteem, motivation to attend therapy, fine and gross motor skills, and ability to self-regulate when faced with an unknown or challenging garden task. Of note, these benefits become all the more heightened when students are able to teach their therapists about what they have learned through their horticultural experiences. Client progress is tracked by the social worker or OT with clinical notes that are updated after each session.

Therapeutic Horticulture Activities in the Educational Garden and Greenhouse

Garden Club – Led by the Lead Garden Teacher/Horticultural Therapist and Garden TA, Garden Club activities are held after school and focus on providing students with engaging and empowering opportunities for recreation, leisure time, skill development, and socialization. Major goals are to create specific opportunities for children to interact with nature, and to experience the physiological benefits associated with these interactions (e.g., a sense of calm through lowered heart rate, decreased blood pressure, and sensory integration). The Garden Club meets in the Greenhouse when the season requires students be in sheltered environments, such as at the end of the growing season. Activities during these colder months include plant care and crafts, tea making, and starting seedlings in the spring. During the warmer growing season, students partake in tilling soil, composting, planting starters, providing ongoing plant

maintenance, weeding, and harvesting. Additionally, Garden Club youth participants usually sample the produce, and sometimes bring newly harvested fruits, vegetables, and herbs to the kitchen staff to include in prepared meals.

In the Garden Club, student progress is not tracked or documented, and activities are not treatment goal-oriented. The club typically runs every day after school for one hour, although youth need only attend once a week. The Garden Club's relatively small number of youth participants (i.e., 5-8 students/session) allows for more specialized attention from staff and the ability to focus on specific tasks. Students must be safe and respectful to others and the environment in order to participate in Garden Club.



Although Garden Club is facilitated by Garden staff, it is also popular among Green Chimneys volunteers who enjoy sharing their passion for horticulture with students in a relaxed setting.

Meditation Labyrinth – This area in the Educational Garden has been useful in providing a calm environment for students to regulate their emotions, behaviors and physiological responses to stress, both generally and during times of crisis. The Meditation Labyrinth is utilized daily as an effective space for students to cope when dysregulated. Access to this intervention helps students remain engaged, or helps them to re-engage, in primary educational and therapeutic activities after experiencing emotional or behavioral difficulties. Additionally, walking through the labyrinth may encourage the development of gross motor, problem-solving, decision-making, and critical thinking skills.

Sensory Mud Kitchen – Like the Meditation Labyrinth, the Sensory Mud Kitchen provides a soothing, grounding, and sensory-rich environment to support self-regulation for students in crisis. Constructed out of cinderblocks and woodwork, this outdoor play kitchen consists of countertops, a functional sink, a play stove and oven, and a variety of tools (e.g., containers of different sizes, spatulas, and sculpting utensils). Children use this space to experience sensory, emotional and imaginative play, which ultimately benefits the development of motor, math, science, and communication skills.

Garden Visits – Youth often use the Garden and Greenhouse as safe havens to help them de-escalate when feeling upset or when they are in need of a break from structured dormitory or school programs. Because plant-rich environments tend to be quieter and less complex in terms of sensory stimuli than other settings (Berto, 2014; Simson & Straus, 2004), and allow for



While the Garden is primarily used for structured horticultural-based interventions, some students use this space to de-escalate from a stressful day by walking between the planting beds or sitting on the garden swing.

effortless and involuntary attention (Kaplan & Kaplan, 1989), these settings offer students a space for respite. Seemingly simple activities like walking through the Meditation Labyrinth, daydreaming on a garden bench or swing, or painting signs in the Greenhouse can ground students to the present and provide perspective and calm (A. Frost, E. Link, & B. Nicoletti; personal communication; March 28, 2019).

Therapeutic Horticulture Education in the Educational Garden and Greenhouse

Garden Class – Each student at Green Chimneys attends Garden Classes once per week during two out of four quarters of the school year. Led by the Lead Garden Teacher/Horticultural

Therapist, the Garden TA, and a general classroom TA from the broader school setting, Garden Classes generally include 12 students each and are designed to cover topics related to science, math, history, social studies, and/or nutrition. Likewise, teachers introduce gardening lessons and activities to students with the intention of



In Garden Class, students get their hands dirty learning about soil composition and soil science.

improving their self-esteem, confidence, competence, empathy, and social skills. Overall, the goals of this program are to provide educational instruction to students in an engaging format and setting, while promoting physiological, sensory, and stress-related benefits through the presence and cultivation of garden plants.

During classes, students participate in individual and small group activities. Groups of three students are typically partnered with a Garden staff member for activities consisting of passive experiences with nature (e.g., plant care lessons, garden observation, and sensory perception) or active interactions with plants and plant materials (e.g., planting and harvesting). While Garden Classes are customized to support students' individual educational goals, these interventions also encourage youth to look beyond their own needs by working collaboratively with others to support the well-being of the Garden and the surrounding environment. Students are graded for their participation in this class, which is formally documented on their quarterly report card.

In the fall and winter, Garden Class activities consist of picking cold weather crops (e.g., spinach and gourds), planting garlic and flower bulbs, making grass clippings for mulch, caring for existing plants and propagating new ones in the Greenhouse, maple sugaring at Boni-Bel Farm, and engaging in a variety of plant crafts. These crafts include pressing flowers; drying culinary herbs; mixing potpourri; creating gifts for their families and friends; and making soap, lotions,

candles, and dye (i.e., for stamping) from different plant materials. In the spring, students help transplant seedlings, plant seeds, distribute compost, till soil, and build trellises and other garden infrastructure. Activities conducted during the height of the growing season include thinning and spacing plants, watering, weeding, trimming, humanely managing plant pests and diseases, and planting succession and cover crops. Finally, towards the end of the season, students help with harvesting, making food products and crafts with crops (e.g., vegetables and herbs) and plant materials (e.g., a wreath made from stems, acorns, and leaves), drying plants, and preparing the garden beds for winter.



In the fall and winter seasons, the Garden Club meets in the Greenhouse to participate in a variety of activities, including making tea from and the dried leaves of plants harvested from the Herbal Tea Garden.

Learn and Earns – Learn and Earn activities in the Educational Garden and Greenhouse pair students with trusted adult mentors who provide practical instruction, guidance, support, and encouragement while youth complete tasks to support the health of the gardens and school community. This helps Green Chimneys students gain important vocational skills, such as following directions, punctuality, work planning, record keeping, and time management. Students also apply classroom lessons to “real world” work experiences by measuring the dimensions of a garden plot, counting and weighing harvested squash, writing thank you notes

to volunteers, helping develop a creative recipe using only food from the Garden/Farm, and presenting his or her garden contributions and lessons learned to others. Through these and other activities, students strengthen fine and gross motor skills (e.g., counting and separating small seeds, pushing a heavy wheelbarrow full of compost) and social skills by working collaboratively with peers and mentors.

Students participate in Learn and Earn activities individually with staff, or as a member of a group of 4-5 peers. Specific Learn and Earn tasks in the Greenhouse often center on helping the Garden Intern prepare for, or clean up after, the various other activities that take place in these program areas. This HBI often occurs during the school day and ranges in length from 30-60 minutes. Typically, the Garden Intern oversees Learn and Earns for students who are particularly interested in gardening. This activity is vocational in scope and not used as a reward or punishment; however, all students must demonstrate that they can be safe towards themselves, others, and the environment in order to participate in this educational activity.

9.10 Summary

The Educational Garden and Greenhouse provides students with convenient campus access to plants and garden environments through a variety of horticultural therapy and therapeutic horticulture activities (i.e., education and enrichment). Year-round HBIs in these natural settings are designed to both



engage and calm students via sensory stimulation, attention restoration, stress reduction, integrated and experiential learning, and physical hard work that leads to concrete results. Beyond plant propagation, maintenance and harvesting, the Greenhouse and outdoor Garden

provide youth with opportunities to nurture other living beings, learn practical applications of scientific and conservation concepts, gain diverse vocational skills, practice patience, create plant-based crafts, contribute to cooking and baking activities, meditate, and recover safely when feeling overwhelmed, angry, and/or dysregulated.



Moreover, programming and interventions in the Educational Garden and Greenhouse are closely aligned with SEL, as well as the *Big Three* and *Five Cs* of the PYD model. Through HBIs, students benefit from the focused attention and supportive mentorship of social workers, OTs, horticultural

therapists, teachers and TAs, and adult interns during activities that build important life skills and benefit the Green Chimneys community and the natural environment. Likewise, youth gain competence and leadership in gardening skills through hands-on learning and encouragement. These activities ultimately lead to increased self-confidence and character development among students, especially when they see their hard work literally come alive and blossom. In this way, youth are able to make meaningful connections between their contributions and accomplishments regarding a plant's maturation and their own personal growth. Importantly, youth also connect to nature, others, and themselves by caring for Garden and Greenhouse plants from seed to harvest.

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Chapter 10: Boni-Bel Farm



Boni-Bel Farm is one of Green Chimneys' most popular program areas, greatly enjoyed by students, staff, and the surrounding community. Located less than a mile down the road from the main Green Chimneys campus, Boni-Bel is home to a two-acre organic garden, farm, greenhouse, fruit orchard, seasonal Farm Stand, and Country Store. Farm staff offer recreational, therapeutic, and vocational horticultural-based interventions (HBIs) where students participate in unique leadership activities and develop important life skills, such as problem-solving, caregiving, adapting to change or uncertainty, and interpersonal communication. With a committed approach to ethical, humane and organic food production, Boni-Bel Farm also strives to promote responsible agricultural practices, environmental sustainability, and healthy nutrition. Overall, social-emotional learning (SEL) and positive youth development (PYD) are fostered through the Farm's engaging, supportive, and dynamic programming and natural environment.



10.1 Summary of Selected Research

Although relatively uncommon in the United States, “care farming” or “the use of commercial farming and agricultural landscapes to promote mental and physical health through normal farming activity” (Elsey, Murray, & Braggy, 2016, p. 99) is widely utilized across Western Europe, particularly to support youth and adult populations with mental health challenges, substance use disorders, autism spectrum disorder (ASD), and/or learning disabilities (LD; Elsey et al., 2016; Ferwerda-van Zonnevald, Oosting, & Kijlstra, 2012; Loue, Karges, & Carolton, 2014). Notably, care farming at Green Chimneys differs from how it is often practiced in Europe in that it harvests only plants, bee products (e.g., honey) and chicken eggs, rather than also raising animals for dairy and meat production purposes. Research regarding the effectiveness of care farming and other similar programs is marked by design limitations. However, their rapid growth in Europe is promising and indicative that mental health and education professionals widely perceive them to be beneficial (Elsey et al., 2016; Ferwerda-van Zonnevald et al., 2012; Iancu et al., 2015; Loue et al., 2014).

A 2015 systematic review of the literature regarding the use of HBIs on farms for adults with mental disorders found 11 articles representing only 5 studies, 3 of which were randomized controlled trials (Iancu et al., 2015). These studies took place in the United States, China, and Europe. In one study included in this review, Gonzalez, Harding, and Patil (2009) evaluated the effects of spending six hours per week farming over a period of 12 weeks for 46 adults with depressive disorder. Findings indicate that participants’ depressive symptoms declined in the first four weeks of the farm-based intervention, with additional and significant improvements seen in anxiety, perceived stress, attentional capacity, and social activity over the 12 week study period; however, no control group was utilized for comparison (Gonzalez et al., 2009). Overall, Iancu and colleagues (2015) concluded in their review that farm interventions should be

considered for patients diagnosed with mental disorders, but that further research is needed to confirm whether there are indeed therapeutic benefits associated with these activities.



Other research – which, of note, is primarily comprised of qualitative designs and/or quantitative studies with small sample sizes – indicates that youth and adult participants in farm interventions (a) find the experience calming (Anderson, Chapin, Rimer, & Siffri, 2017; Elsey et al.,

2016; Mills, Taylor, Dwyer, & Bartlett, 2014; Rappe, Koivunen, & Korpella, 2008); (b) report an improved ability to concentrate (Elsey et al., 2016; Rappe et al., 2008); (c) are better able to regulate their emotions (Twill, Purvis, & Norris, 2011); and (d) benefit from the structured routine that farm work provides (Kennedy, 2014). The calming effects of farming activities have recently been supported by several studies. For example, Lee and colleagues (2013) found that eight adults who spent a single session transplanting real flowers from one pot to another showed a significant decrease in sympathetic nervous system activity (indicating reduced physiological arousal), while eight control participants who handled artificial flowers did not show a similar change. Likewise, one study found that university students who tended to plants exhibited reduced sympathetic nervous system activity compared to students who mimicked the physical tasks of plant care without actually interacting with a live or fake plant (Park, Song, Oh, Miyazki, & Son, 2017).

Due in part to the social nature of many farm activities, youth participants often experience an improved sense of social support while participating in HBIs in farm environments (Hemingway, Ellis-Hill, & Norton, 2016; Kogstad, Agdal, & Hopfenbeck, 2014; Moeller, King, Burr, Gibbs, & Gomersall, 2018; Rappe et al., 2008). In fact, several studies have found that a

participant's relationship with the lead farmer(s) is particularly significant and may be linked to documented benefits associated with care farming activities (Elsey et al., 2016; Kennedy, 2014; Kogstad et al., 2014). Key factors to a favorable youth-farmer relationship include farm leaders who (a) develop a positive group atmosphere (Kogstad et al., 2014), (b) provide appropriate training and support so that participants feel successful and gradually strengthen their abilities (Ferwerda-van Zonnevald et al., 2012; Kogstad et al., 2014; Moeller et al., 2018), and (c) offer supportive attention to participants (Ferwerda-van Zonnevald et al., 2012).

Additionally, some youth benefit from the fact that the focus

of these HBIs is on farm work, rather than direct social interactions. In this way, youth can participate in a meaningful activity with others without the pressure or anxiety of having to interact socially or to speak about topics other than the work itself (Elsey et al., 2016).

Farm- and nature-based interventions may also provide youth with a sense of self-efficacy and personal autonomy (Elsey et al., 2016; Hardin-Fanning, Adegboyega, & Rayens, 2017; Hemingway et al., 2016; Kogstad et al., 2014; Loue et al., 2014; Mills et al., 2014; Moeller et al., 2018; Szofran & Myer, 2004). As a construct, self-efficacy has been defined as "people's beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives" (Bandura, 1994, p. 71). Gaining a sense of mastery over a particularly challenging or even daunting task at the farm (e.g., operating a tractor, assisting with "smoking bees" to safely and humanely access the hive, or speaking with farm patrons) empowers youth with the knowledge that they can overcome other adversities in their life (Benight & Bandura, 2004; Kaufmann, Kinoshita, & Teumer, 2019). In addition to offering opportunities to produce clear and tangible accomplishments through hard work, HBIs in farm



Green Chimneys is home to two honey bee colonies who use boxes like this one in which to build their hives.

environments support youth in developing career technical education (CTE) skills that will likely aid in their future independence and employment prospects (Elsey et al., 2016; Hambridge, 2017; Iancu et al., 2015).



This bee smoker is a vital tool used in honey harvesting, one skill students can master at Boni-Bel. The smoke temporarily subdues the bees, making it safe to access the hive.

School and care farm programs also offer potential physical health benefits for young people by providing access to fresh and nutritious produce, which is often hard to come by for children and families of low income (Algert, Agrawal, & Lewis, 2006). According to the Centers for Disease Control and Prevention, children need to consume a wide variety of fruits and vegetables in order to promote healthy development (DeSalvo, Olson, & Casavale, 2016). Indeed, research suggests that a student's academic performance and ability to focus are strongly correlated with his or her nutritional intake (Ozer, 2007). Although total fruit and vegetable intake for children has increased in recent years, most children are still not consuming their recommended daily amount (Kim et al., 2014). Moreover, recent data indicate that up to 40% of the dietary intake among individuals between the ages of 2 and 18 years consists of added sugars and solid fats (Reedy & Krebs-Smith, 2010).

Growing fruits and vegetables and introducing them as food options early in life can encourage children to eat a more balanced and healthy diet throughout their lives (Loso et al., 2016). As discussed in Chapter 9, school gardening programs also seem to influence the dietary choices students make, specifically by encouraging children to choose vegetables as snacks over less nutritious foods (Lineberger & Zajicek, 2000; McAleese & Rankin, 2007; Morris, Neustadter, & Zidenberg-Cherr, 2001; Morris & Zidenberg-Cherr, 2002). One recent review examined 15

studies on “farm-to-school programs,” in which schools, local farms, and communities partnered to promote healthy eating habits and local economic growth (Joshi, Azuma, & Feenstra, 2008). Overall, the programs in these reviewed studies improved students’ dietary behavior, particularly when the farm produce was fresh, local, and supplemented by educational activities on topics such as nutrition and environmental health (Joshi et al., 2008). Likewise, studies indicate that participating in this type of programming leads to increased physical activity among youth (Elsey et al., 2016; Joshi et al., 2008), although the research in this area is less extensive.



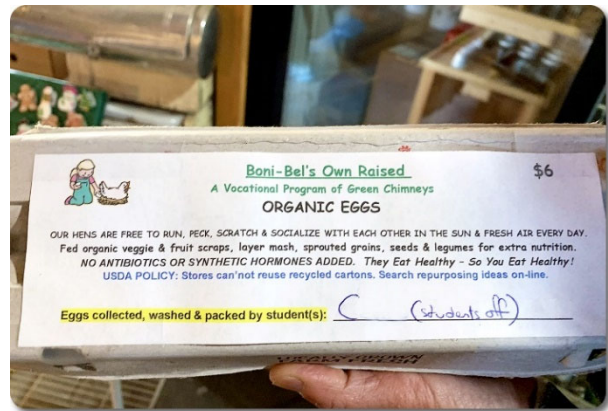
10.2 Overview of Boni-Bel Farm

Boni-Bel Farm provides students with a direct connection to nature and to their food, allowing for integrated learning opportunities, experiential education and CTE, therapeutic experiences, and physical recreation. Originally owned by Bella Meyer (Dr. Ross’ longtime secretary) and her daughter, Boni, two women who managed the property as a dairy farm, this plot of farmland was purchased by Green Chimneys and became a key program area in 1995 (Green Chimneys, 2014). Not long after, a fruit orchard, apiary, and maple shack were added to the farm, with the current Country Store being built in 2008 (Green Chimneys, 2014). While growing vegetables and interacting with plants have been an integral component of Green Chimneys since its inception, this new



HBI program at Boni-Bel Farm offered students a unique medium for learning and healing, unlike any they had previously encountered in traditional schools or treatment settings. Today, Boni-Bel remains one of the most popular program areas at Green Chimneys, partly because it offers children and youth a sense of “being away” from campus while engaging in novel, outdoor activities in a working farm environment. This aspect may be particularly beneficial for residential students who live and spend most of their time on campus.

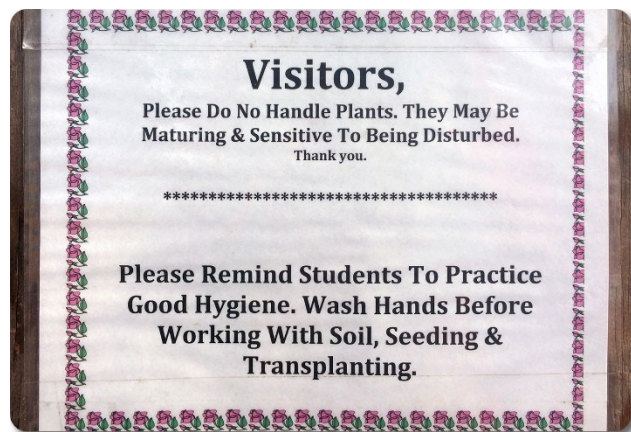
Under the supervision and guidance of Farm staff, students are tasked with the “day-to-day responsibilities of Boni-Bel and its retail operations” at the Country Store and seasonal Farm Stand (Green Chimneys, 2019, para. 5). The development of horticultural and vocational competencies is one focus, as well as fostering a steadfast commitment to sustainable agricultural practices and environmental stewardship. In this setting, students learn a variety of useful skills, from tapping maple syrup to operating farm equipment to harvesting crops. In this way, students gain confidence and develop character through gaining farming expertise, caring for plants and other farm inhabitants, and deftly connecting with members of the community.



10.3 General Policies, Practices, and Procedures

The safety of students, Green Chimneys personnel, animals (e.g., chickens, honey bees, and other insects), plantlife, and members of the community at Boni-Bel Farm is highlighted

throughout the policies, practices, and procedures of this program area. Because of the Farm's distance from campus and the serious nature of activities that take place in this setting, staff must carefully consider matters of safety and risk (as well as potential benefits) when selecting student participants



for this program area. The general Boni-Bel rules state that, while participating in the Farm Program, students (a) are not permitted to walk, run, or spit in the garden beds or pastures; (b) must always use safe practices whenever handling or operating hand tools or farm equipment; and (c) should keep their hands clean through hand washing or sanitizing. These rules must be consistently adhered to while working at Boni-Bel, especially given that some activities at the Farm can be dangerous (e.g., working with gardening tools, beekeeping, collecting honey) or linked to personal and public health issues without the use of proper sanitation practices (e.g., handling manure on the Farm).

10.4 Staffing

Below are descriptions of the HBI staff and volunteers who work primarily at Boni-Bel Farm and Country Store. As needed, the Coordinator of Boni-Bel Farm, Country Store, and Vocational Programs and the Boni-Bel Program Assistant will also assist with activities in the Educational Garden and Greenhouse (see Chapter 9) on Green Chimneys' main campus.

Coordinator of Boni-Bel Farm, Country Store, and Vocational Programs – This individual manages Boni-Bel's operations and oversees HBIs at the Farm, including Learn and Earn and CTE activities during the school week and on weekends for residential students. This position requires a strong background in farming and agriculture, practical knowledge of nutrition and

wellness, and prior experience working with youth who have psychosocial challenges and/or special education needs. As needed, this individual also provides day-to-day farming and facilitation training to the Boni-Bel Job Coaches, Program Assistant, Volunteers, and Garden Interns (see Chapter 9) to ensure that the Farm and the therapeutic and educational student programs are successful. The financial management and organizational development of the Boni-Bel Country Store and Farm Stand are also key responsibilities of this position, along with the direct supervision of the Boni-Bel Job Coaches.

Boni-Bel Job Coaches – These individuals supervise and teach CTE students a variety of vocational skills related to chicken husbandry, maple sugaring, beekeeping, and the management of the garden/orchard, Country Store, and Farm Stand. Boni-Bel Job Coaches must have prior experience working with students who have special education needs. A background in farming and/or gardening is also strongly preferred.

Boni-Bel Program Assistant – The Boni-Bel Program Assistant must have prior experience working with children and adolescents with special needs, and be at least 21 years of age. While this individual is primarily responsible for helping run Boni-Bel Farm and Country Store, he or she also contributes to programming in the Educational Garden and Greenhouse (see Chapter 9). For example, this person may oversee daily Learn and Earns across all three HBI program areas, as well as Garden Club activities that take place at Boni-Bel (e.g., maple sugaring). Likewise,



contingent on the current staffing structure and schedules, the Boni-Bel Program Assistant may spend up to half of his or her week helping maintain the health of plants on campus, leading

Garden Club activities in the Educational Garden and Greenhouse, or facilitating community programming and tours on Sundays.

Boni-Bel Program Volunteers – Individual volunteers from the community or large volunteer groups (e.g., contributors and corporate partners) play a pivotal role in the operation of Boni-Bel Farm. Volunteers are typically split into groups based on interest and/or ability, and receive personalized training in that specific area. For example, volunteers often contribute to planting, harvesting, seeding, transplanting and pasture upkeep tasks, and are supervised and supported by Green Chimneys’ Farm and Wildlife Director; Coordinator of Boni-Bel Farm, Country Store, and Vocational Programs; Boni-Bel Program Assistant; and/or Farm Animal/Barn Caretaker (see Chapter 6). Overall, volunteering at Boni-Bel is greatly beneficial to the farm environment and student programming, and provides an enjoyable and rewarding recreational activity for participants. Boni-Bel Program Volunteers typically contribute to essential farm activities for a period of 5 to 7 months.

10.5 Facilities and Tangible Resources

Boni-Bel Farm is approximately 15 acres in total and is located less than a mile south from the main Green Chimneys campus. While there is a trail that connects the campus to the Farm, students are often driven the short distance to Boni-Bel for safety and liability reasons. Home to approximately 14 chickens, 2 bee colonies and a wide variety of crops and plantlife, Boni-Bel includes a barn; a chicken habitat enclosure; a respite hen house for birds who are ill and need specialized care; a maple sugar shack; a Country Store and community-supported agricultural Farm Stand; three tool sheds; and a wide variety of farm equipment, tools, and gardening materials. Likewise, a large, L-shaped farmhouse is adjacent to a one-acre fruit orchard, a medium-size greenhouse (approximately 20’ x 40’), and a two-acre farm plot containing over 20

cover crop varieties and other plants. This farmhouse currently serves as the private residence for two Farm and Garden/Greenhouse staff.



The chicken enclosure (pictured above at left) is a 60' x 60' open-air space encircled by a low fence and covered with a tented, lightweight netting to protect the birds from predators. Within this habitat is a picnic table, a respite hen house (pictured above at right), and several ground-level enclosures that provide shade and protect the chickens' food and water from harmful contamination (e.g., from the feces of wild birds).

In addition, the onsite maple sugar shack (pictured to the right) is approximately 12' by 20' and houses an evaporator, hydrometer, a bottling machine, taps, buckets, a holding tank, a stove, a 250-gallon tank (to transport sap from the sugar maple trees to the shack), and a trailer.



Boni-Bel's Country Store is located within the farmhouse that serves as a primary site for HBIs at the Farm. The single-room Country Store serves as a year-round retail outlet for products crafted and/or sourced by Green Chimneys students and local artists, including, but not limited

to: honey, maple syrup, chicken eggs, dried herb and flower bouquets, t-shirts, yarn, candles, soap, candy, and homemade dog treats. Directly adjacent to the Country Store is the “Discovery Room,” which is used for staff meetings and CTE classes with students. Here, supervised children and youth engage in hands-on activities such as bottling maple syrup and preparing other retail items for sale (e.g., labeling and packaging products). Likewise, an adjoining office is used by Boni-Bel staff for financial and organizational management activities. Directly above the office, rustic storage space houses extra non-perishable retail inventory and holiday decorations.

The agricultural Farm Stand (pictured at right), once a mobile green and white cart, now has a permanent structure that serves as a display of fresh fruits and vegetables that are sold to community members throughout the spring, summer, and autumn months. In addition to Green Chimneys’ organic produce, the Farm Stand also features crops from other local farms. The stand is situated in front of the Country Store, and is frequently run by Green Chimneys students. When students or staff are unavailable, a cash box sits on the stand for patrons to pay for their produce and wares using the honor system.



10.6 Plants at Boni-Bel Farm



Table 10.6.1 (page 364) lists the current varieties of ornamental, food, and cover crops (or those grown to protect and enrich the soil) living at Boni-Bel Farm, all of which are grown organically and pesticide free.

Table 10.6.1. Crops and Plants at Boni-Bel Farm

Type	Variety
Herbs	Basil, Lemon Balm, Parsley
Root crops	Carrots, Garlic, Onions, Red Potatoes, Yams
Vine crops	Cucumbers, Gourds, Grapes, Green and Red Peppers, Pumpkins, Summer and Winter Squash, Cherry Tomatoes, Slicing Tomatoes, Watermelon, Zucchini
Brassicas	Broccoli, Brussel Sprouts, Cabbage, Cauliflower, Kale
Greens	Rainbow Swiss Chard, Leaf Lettuce, Romaine Lettuce
Fruit trees	Apple, Asian Pear, Peach
Other food crops:	Asparagus, Corn, Purslane (edible succulent), Strawberries, Sugar Maple Trees
Cover crops	Hairy Vetch, Rye
Ornamentals	Annual Flowers, Perennial Flowers, Milkweed

10.7 Ethical Considerations for Environmental Impact, Sustainability, and the Humane Care of Animals

Much like the Educational Garden and Greenhouse, Boni-Bel employs only organic farming practices to ensure the safety and well-being of people, other animals, and the natural environment. Additionally, Boni-Bel adheres to a strict zero waste policy, meaning all food grown or produced at the Farm is consumed by students, staff, or animals at Green Chimneys; sold to the community at accessible prices; or turned into compost to decrease methane gas emissions and enrich the soil without the



Green Chimneys upholds its commitment to zero waste and environmental sustainability in many ways, including the composting system pictured here.

use of chemical or toxic fertilizers. In addition to sustainable agriculture, Boni-Bel engages in the principles of permaculture, which in this program area includes: (a) encouraging native pollinators (e.g., bees, butterflies, beetles) to interact with plants on the Farm; (b) taking only what is needed from the land and when the crop is at peak abundance; (c) limiting waste and using renewable resources whenever possible; and (e) respecting nature through organic farming practices. Moreover, Boni-Bel staff ensure that safe shelter is accessible for birds and bees, including protective netting and a respite hen house for chickens, as well as a “winterized” hive (i.e., wrapped to limit bee and human access) for bees. The chickens’ food and water is also kept under spacious coverings to prevent contagious disease from other birds and animals. In short, students are expected to engage respectfully with all living beings, no matter the species, while at Boni-Bel Farm.



The Grand Insect Hotel provides habitat and protection from predators to some of Green Chimneys’ most important pollinating residents, including moths and solitary mason and carpenter bees.

10.8 Boni-Bel Farm as a Context for Positive Youth Development

The *Big Three* at Boni-Bel Farm

Positive and sustained relationships between youth and adults – Through working closely with Boni-Bel staff and Garden Interns, youth at Green Chimneys have the opportunity to build positive and sustained relationships with adults who are committed to their safety, learning, and growth. A strong connection between youth and adults is often forged through horticultural and CTE training activities where both are working hard towards a common goal, such as weeding plants, repairing farm equipment, or packaging honey for purchase. Given their extensive knowledge in farming, environmental conservation and personal wellness, staff also serve as

important role models for students who are interested in these areas. Additionally, under staff supervision, youth at Boni-Bel interact frequently with adults from the community, including engaged volunteers and customers of the Farm Stand and Country Store. Among other benefits, these diverse relationships help foster responsibility, accountability, self-composure, and pride for youth participants (T. Ghook, personal communication, March 29, 2019).

Activities that build important life skills – In addition to learning skills related to farming, beekeeping, chicken care and maple sugaring, Boni-Bel Farm provides practical opportunities for students to develop soft and hard business skills. Students who struggle in more traditional classroom environments often “find their niche within learning” at Boni-Bel (G. DeLaVergne, personal communication, March 29, 2019). At the Farm, youth are able to be active, work with their hands, and take on new challenges and responsibilities. The Coordinator of Boni-Bel Farm, Country Store, and Vocational Programs ensures that participating students are connected to their passions and interests even if these are not directly plant- or farm-related. For instance, youth with an interest in graphic design are often taught to make labels for syrup and honey bottles, as well as signs welcoming people to the Farm. Students with retail and business interests are given the chance to work in the Country Store stocking shelves, operating the cash register, and assisting customers. In fact, Boni-Bel creates opportunities for students to earn credits towards a Career Development and Occupational Studies credential when they graduate high school, which increases their chances of successful employability as emerging adults. By participating in these CTE activities, students learn the importance of critical and creative thinking, focus and



awareness, collaborative problem-solving, and effective communication – skills that will serve them well throughout their lives.

Opportunities for youth to use life skills as participants in, and leaders of, valued community activities – Students who participate in Boni-Bel programming learn a variety of skills related to organic farming, environmental and public health, and personal wellness through healthy and conscientious living. Moreover, by learning nearly every element of the farming process, students gain valuable and specialized expertise that may be further applied to a variety of personal interests, community activities, and future professional pursuits. For example, youth who have shown marked progress at Boni-Bel serve as leaders by assisting staff with public Farm tours and by sharing their knowledge with fellow Green Chimneys students. Likewise, youth who thrive in this environment often use their skills to work in personal and community gardens, farms, and/or nurseries as adults.



The *Five Cs* of PYD at Boni-Bel Farm

Competence – Youth have a number of opportunities to develop and demonstrate *competence* at Boni-Bel Farm. In this program area, they learn new and challenging tasks, and are able to practice these skills alongside encouraging adults. Farm staff also take an active interest in each student’s passions, and recognize his or her accomplishments with praise and often greater responsibility. Indeed, as students demonstrate increased knowledge, safety, and reliability regarding a particular task (e.g., handling tools), they may be given opportunities to work with more autonomy while in the Farm environment. When youth are trusted with the management

of transplanting flowers, leading an informational session on maple sugaring with peers and/or the public, or helping orient a new adult Farm Volunteer to the team, they feel not only competent, but uniquely skillful. Likewise, learning a variety of complex skills in an area of personal passion can be meaningful for many students. In describing a day student with an interest in machinery, one staff member remarked,

One of the needs is to work with students to teach them vocational skills regarding small engine repair. [One student] fit right into that area of Boni-Bel. He comes down and helps fix weed whackers, mowers, learns how to maintain them, changes the oil. He loves to work with his hands and tools (T. Ghook, personal communication, March 29, 2019).

Connection – Certain HBIs at Bon-Bel Farm (e.g., Learn and Earns) take place over longer periods of time than those on campus, ranging from 1.5 hours per day to multiple full days in some cases. This may encourage students to form a stronger sense of *connection* with a particular crop or area of the Farm, as well as with other student farmers and staff working on the same project. Additionally, students connect with volunteers on the Farm and with



During the holiday season, students connect with the community through selling Christmas trees on the grounds in front of Boni-Bel's Country Store.

members of the community through the sale of food, farm products and Christmas trees, which often lends a greater “community feel” to the setting as compared to areas of the main campus. Finally, being able to connect their hard work and dedication with a bountiful harvest, repaired tractor, or income from Farm Stand purchases can be very fulfilling for students.

Confidence – As students gain mastery and learn a variety of new farming skills, many of them challenging and physically demanding in nature (at least initially), they often experience

confidence in their growing knowledge and abilities. For youth, this process highlights and clarifies both their existing talents, and areas in need of further growth. In this way, students are able to feel confident in specific tasks that they do well, which helps instill a sense of identity and pride in who they are. This is particularly helpful for students who believe their lives lack purpose and meaning; at Boni-Bel, they can feel assured in the knowledge that their work has value, that people have different talents, and that everyone approaches learning new skills at a different pace (T. Ghook, personal communication, March 29, 2019). Farm activities that require a high level of responsibility (and therefore tend to build student confidence) include using tools, operating the tractor, and performing monetary transactions at the Country Store.

Character – Much like with other program areas at Green Chimneys, students develop *character* at Boni-Bel by working hard; committing to a project and seeing it through (e.g., caring for plants throughout their entire life cycle); helping others during times of need; being kind and respectful to people, animals, and the environment; and taking accountability for any missteps. According to Boni-Bel staff, students are reminded that mistakes are normal and acceptable, and that they should be viewed as a learning experience rather than a source of personal guilt or shame (G. DeLaVergne, personal communication, March 29, 2019). Moreover, through evidence of a healthy crop, youth are able to see the tangible value of their caretaking and hard work, thereby motivating them to behave in similar ways going forward and in other facets of their lives.

Caring – An important part of character development for students at Boni-Bel Farm is learning about the importance of *caring* for plants in tender and responsible ways. The Coordinator of Boni-Bel Farm, Country Store, and Vocational Programs teaches youth about the vitality and unique qualities of plants, drawing similarities between their needs and those of humans and other animals. For example, when describing important tasks like pruning or tapping sugar

maple trees, Boni-Bel's Coordinator calls on students to take thoughtful action so as not to hurt them. Moreover, he often encourages empathy for the plants at the Farm by encouraging youth to talk to them and to reassure them that they will thrive and be well-cared for. Through this process, many students begin to see the plants as being alive, and deserving of compassion and respect.

10.9 Horticultural-Based Interventions at Boni-Bel Farm

Boni-Bel Farm is primarily utilized by older youth (i.e., in junior high and high school) who are self-motivated to participate in farming activities. In addition to providing genuine educational and/or therapeutic experiences for students, HBIs at the Farm are designed to produce and sell organic fruits, vegetables, herbs, honey, and maple syrup at the community-supported Farm Stand and Country Store. Notably, although Green Chimneys does not currently include educational progress made at Boni-Bel in student report cards, plans are in place to do so in the near future.

Horticultural Therapies at Boni-Bel Farm

Individual Horticultural Therapy – Given the working nature of Boni-Bel Farm, and its distance from the main campus, horticultural therapy sessions in this setting are relatively rare. When they do occur, therapists tend to partner with the Coordinator of Boni-Bel Farm, Country Store, and Vocational Programs or the Boni-Bel Program Assistant to conduct the session as a team, with the Boni-Bel staff member leading the individual student through a farming activity and the social worker or occupational therapist (OT) making connections to his or her treatment goals (i.e., via the diamond model). Often, the



activity is used to enhance the therapeutic alliance or motivate student engagement in the treatment process. Likewise, farming tasks may provide helpful distraction from sadness or worry, promote emotional self-regulation, stimulate the senses, reduce stress and anxiety, offer productive avenues to relieve feelings of aggression, improve social skills, increase self-esteem, and encourage enthusiasm for the future. Client progress and/or setbacks at Boni-Bel are documented by the social worker or OT following each horticultural therapy session.

Therapeutic Horticulture Activities at Boni-Bel Farm

Plant Care – Students contribute to a variety of plant care activities in the spring, summer and fall at Boni-Bel, such as planting and sowing seeds, composting, transplanting, watering, weeding, pruning, picking, and harvesting. Generally, students are given the choice of plant care activity, as well as where to work on the farm (e.g., the orchard, greenhouse, or garden beds), depending on their individual interests and abilities. As the plants in their care eventually become food, student farmers may feel gratified knowing that, through their diligent labor, they are providing for others.

Maple Sugaring – Students assist with every step of the maple sugaring process at Boni-Bel. This includes tapping the trees (pictured below at left), collecting buckets filled with tree sap, filtering and boiling the concentrated sap in the Farm’s maple shack under staff supervision (pictured below at right), canning or bottling maple syrup, applying labels to the bottle, and



selling the finished product at the Farm Stand or Country Store. As a result of participating in this comprehensive process, students are able to feel a genuine sense of accomplishment while learning useful vocational and social skills.

Farm Stand and Country Store – A key role for students at Boni-Bel is to prepare organic produce and other food products (i.e., maple syrup, honey, chicken eggs) to be sold at the Farm Stand and Country Store. Typical activities include selecting and harvesting produce, packaging and labeling certain items, stocking and cleaning the stand or store, running the cash register or Square credit card reader, and providing customer service to farm patrons. Through these tasks, students may engage in critical thinking, decision-making, attention to detail, basic math and/or technology skills, and helpful communication. Primarily, a student’s confidence is fostered via direct and indirect positive feedback from customers and staff, and through relying upon his or her own knowledge and experience when responding to a retail request or challenge.

Therapeutic Horticulture Education at Boni-Bel Farm

Honey Production – During their time at Boni-Bel, youth are able to explore and interact with an observation beehive, located away from direct sunlight in the Discovery Room adjacent to the Country Store. Students are also involved in learning to build and prepare the beehives;

place bees into the hives;

maintain and care for the hives;

and retrieve, bottle, label, and/or

sell honey – all of which provide

them with confidence, important

practical skills, and CTE

experience. Moreover, there has

been a recent shift at Green

Chimneys towards “problem-



based learning,” a student-centered approach in which youth work in teams to find solutions to open-ended problems (see Chapter 2 for additional information). This method has proven to be a useful tool for teachers and teaching assistants (TAs) because it allows students to creatively engage in finding solutions and to learn in a variety of ways, including visually, kinesthetically, orally, aurally, socially, and logically (Kincaid & Jackson, 2006). One example of problem-based learning at Boni-Bel involves the production and sale of honey, where students utilize their unique and collective strengths to safely collect, properly package, and successfully sell honey to the community. If an unforeseen problem arises (e.g., the credit card reader stops working during a honey purchase), the group must work strategically as a team to solve the issue based on what they have learned in school and at the Farm. Through this process, students also develop financial literacy by comparing the price of their honey with that of other local, organic honey distributors and farm stands; this activity teaches youth to work together to set a fair and competitive market price for a food item they helped produce themselves.

Career Technical Education Farm Group – Led by the Coordinator of Boni-Bel Farm, Country Store and Vocational Programs, this educational HBI guides youth on what is needed to ensure the Farm operates smoothly. Since Boni-Bel is a working farm, activities tend to be fast-paced and focused on applied CTE skills and food production practices, rather than abstract concepts. Typically, up to three students participate in 90-minute sessions five times per week. Boni-Bel staff who facilitate these groups (e.g., Job Coaches) often serve as important mentors for students, providing valuable vocational training in vegetable maintenance, beekeeping, chicken husbandry, and maple syrup production.

Learn and Earns – Students generally work alongside peers and the Coordinator of Boni-Bel Farm, Country Store and Vocational Programs, the Boni-Bel Program Assistant, Job Coaches, and/or Garden Interns to complete various horticulture and agriculture tasks on the Farm.

Often, these Learn and Earn activities are based on the student's individual strengths and interests, as well as the Farm's current needs. In addition to teaching vocational farming skills, these HBIs seek to provide students with individualized attention, deep connections with adult mentors, improved self-confidence, movement breaks and physical leisure activities, ample access to healthy and fresh produce, and an increased sense of focus and calm.

Generally, Learn and Earn sessions at Boni-Bel include one to three student participants, and occur up to three times per week (depending on student motivation and staff availability) for two hours each session. In contrast to other Learn and Earns at Green Chimneys, Boni-Bel offers all-day or even less formal sessions on the weekends for students in the residential life program who are not visiting home. If a Garden Intern facilitates the Learn and Earn session, educational activities are typically documented in the Farm Program's monthly progress notes; otherwise, Learn and Earns at Boni-Bel are not documented.



10.10 Summary

Therapeutic, educational, and vocational programming at the offsite Boni-Bel Farm provides a unique opportunity for students to foster strong relationships with staff and community members, while also building confidence as they contribute to the activities of an operational farm, community-supported farm stand, and retail store. Since its development nearly three decades ago, Boni-Bel has created integrated experiential learning opportunities for youth at Green Chimneys through a strong emphasis on sustainable agriculture and healthy nutrition. Based on each young farmer's individual skills, strengths and interests in horticulture, he or she

works closely with fellow students and Boni-Bel staff on a variety of tasks, from maple sugaring to operating the tractor to harvesting organic fruit and vegetables. Overall, HBIs at Boni-Bel Farm are unique and engaging, not to mention clear standout favorites among many Green Chimneys students.

Embedded throughout the Boni-Bel program are elements of PYD and SEL, including positive connections between youth and adult mentors; activities that build confidence and encourage important life skills (e.g., reliability, competent business skills, and collaborative problem-solving); and opportunities to lead and/or take part in valued community activities (e.g., giving informative tours to visitors and serving customers at the Farm Stand and Country Store). Students also build character by ethically caring for chickens, as well as the plants grown on the Farm, which has broader impacts on the well-being of people, other animals, and the natural environment.



10.11 References

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PART IV

NATURAL ENVIRONMENTS INTERVENTIONS AT GREEN CHIMNEYS



*Come to the woods, for here is rest. There is no repose like that
of the green deep woods. Sleep in forgetfulness of all ill.*

—John Muir, naturalist

Chapter 11: Natural Environments Interventions and Recreational Programming at Green Chimneys



Natural environments interventions (NEIs) – in which participants engage in outdoor, nature-based activities varying in length and physical intensity (e.g., walking in the woods, kayaking in wetland bogs, or engaging in an outdoor challenge course) – offer children and youth diverse ways to connect with the natural environment according to their individual needs, abilities, personalities, and interests. Underlying the NEI approach is mainly Attention Restoration Theory, which proposes that time spent in nature and outdoor settings is inherently calming and improves one’s ability to concentrate and focus. Indeed, a growing body of research indicates that NEIs can enhance youths’ social-emotional learning (SEL), as well as their physical and cognitive development. At Green Chimneys, NEIs are used to: (a) provide opportunities for recreation, creativity, and physical activity; (b) enhance education through hands-on and experiential learning; (c) help youth reach their individual therapy goals, such as increased emotional regulation, confidence, empathy, and self-care; and (d) promote environmental concern and protection. Primarily, these objectives are facilitated through Therapeutic Recreation (i.e., art therapy), Adventure and Wilderness Programming, and Recreation and Outdoor Education in a variety of on- and offsite settings.

11.1 Summary of Selected Research

Activities considered to be NEIs are wide-ranging and varied. Common NEIs include adventure and wilderness therapies, in which people engage in outdoor recreational activities with the guidance of qualified mental health professionals for the purposes of enhancing their personal and interpersonal growth (Russell, 2001). While the physically challenging nature of these outdoor programs offers powerful therapeutic benefits, studies show that simply spending time in nature can also improve a person’s psychological and physiological well-being (Mao et al., 2012; Morita et al., 2006; Morita et al., 2011; Oh et al., 2017). Overall, the broad range of activities that fall under the umbrella of “NEIs,” as well as terms that are inconsistently defined (i.e., “wilderness therapy”), allow for substantial adaptation of interventions based on each participant’s needs, therapeutic goals, preferences, and capabilities (Dobud & Harper, 2018).

NEIs are rooted in ecopsychology, a field stemming from a body of research demonstrating the “restorative effects of natural scenery” (Vujcic et al., 2017, p. 386), and one that seeks to further

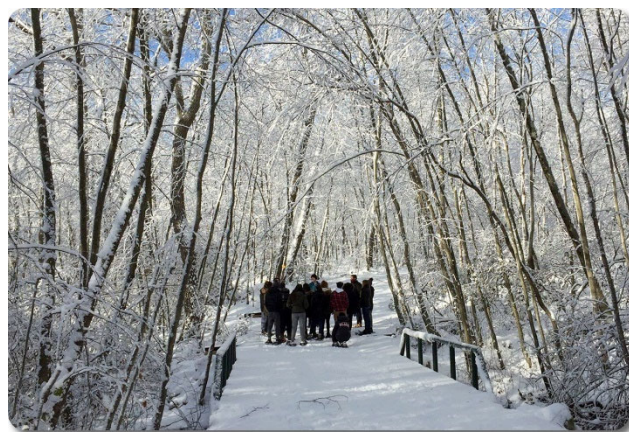


As staff provide supportive supervision and facilitation, Green Chimneys students make steady progress up the challenging ropes course.

understand our emotional connections with the natural world. NEI researchers argue that modern lifestyles have reduced people’s abilities to make meaningful connections to other people and the environment, leading to decreased well-being and subsequent psychological and physical health difficulties (Berger, 2010; Maller, Townsend, Pryor, Brown, & St. Leger, 2006). Today’s leisure and educational pursuits are increasingly reinforcing this disconnect as youth spend more time filtering human and environmental interaction through the technology of smartphones, gaming systems, and online classes (Bexell, Clayton, & Myers, 2019; O’Keefe & Clarke-Pearson, 2011). As these largely indoor and sedentary

activities gain in popularity and “background our every waking moment,” meaningful and active engagement with the outside environment is becoming increasingly rare (Bexell et al., 2019, p. 220; National Recreation and Park Association, 2017). The lack of human-nature interaction that results from this hyper-technological, contemporary lifestyle calls for a broad examination of the impact of time spent engaging in nature-based recreational activities for young people (Gabrielsen & Harper, 2017).

Through experiential natural environment activities, education and therapies, children and youth with diverse learning styles are often engaged by participating in enjoyable and achievable activities that balance their existing skills (e.g., athleticism, stamina, communication) with challenges that help build self-confidence (e.g., climbing to a higher elevation, staying balanced on a



Snowshoeing through the Campus Forest in winter exemplifies the dynamic nature of NEIs by providing students with both a sense of calm and the physical challenge of learning a new skill.

paddle board, holding a yoga pose). According to Flow Theory, this balance can lead to a state of “being in the zone,” in which the individual is immersed in a task with energized focus and is enjoying the process (Hawkins, Townsend, & Garsy, 2016). In turn, these focused and engaged mental and physical states can positively impact student learning and skill development (Hawkins, Townsend, & Garst, 2016). For example, participating in an offsite camping trip allows a student to leverage his or her existing muscular and cardiovascular strengths while learning new and often exacting skills, such as tent-pitching and basic survival. NEIs such as these also support the client or student in cultivating the creative process, using their imagination, and fostering the connection between mind and body (Hawkins, Townsend, & Garst, 2016) in the natural environment.

Interactions with the Natural Environment

A recent meta-analysis of 32 studies found that leisure time spent in natural environments was associated with a moderate improvement in positive affect – including increased experiences of happiness, enjoyment, and interest – and a small, but consistent, reduction in negative affect – including emotions such as anger, anxiety, and fear – among people aged 20 to 28.5 years (McMahan & Estes, 2015). These findings are likely rooted in Attention Restoration Theory, which postulates that engaging in nature is beneficial because it promotes restored and “involuntary” attention, positive psychological function, and emotional calmness (Berger & Tiry, 2012; Joye & Dewitte, 2018, p. 4). Indeed, preliminary research suggests that even the most simple and brief of interactions with the natural environment can have positive results. For example, Igarashi and colleagues (2015) found statistically significant reductions in sympathetic nervous system activity (i.e., fight or flight), as measured by high- and low-frequency heart rate variability components, among 40 high school students who simply viewed live pansies in a planter for three minutes. Of note, a comparison group of students who viewed artificial pansies did not experience the same effects (Igarashi et al., 2015). Likewise, one study found that female university students who were exposed to the smell of natural cypress leaf oils showed an increase in parasympathetic activity, indicating a calming response, while a control group who was not exposed to any odors did not show a change (Ikei, Song, & Miyazaki, 2015).

Additionally, a relatively large amount of research has been conducted on “shinrin yoku” or “forest bathing,” a popular method of relaxation in Japan and other regions in which people spend time in forests to promote overall health (Hassan et al., 2018; Laubreiter, 2019; Morita et al., 2006; Oh et al., 2017). Shinrin yoku emphasizes mindfully taking in the natural environment through multiple senses and, while walking through the forest is often involved, physical activity is generally not a significant element of the experience. Likewise, one need not spend a great deal of time in forests to experience positive effects; some studies have found mood and stress benefits for people after they spent as little as 15 minutes gently walking in a forest environment

(Hassan et al., 2018; Park et al., 2009b). In one study, 498 healthy adults completed a questionnaire at the following four time points: upon arrival to a forest location, while taking a walk in a forest, and twice while on vacation in an unspecified location other than a forested area (Morita et al., 2006). Results showed that participants had significant decreases in hostility and depression and significant increases in liveliness on forest days as compared to vacation days (Morita et al., 2006). Participants' stress levels, as measured by self-report questionnaires, also improved while in the forest, with the greatest effects found in people who had the highest levels of stress at baseline (Morita et al., 2006). Additional documented benefits of shinrin yoku are listed in Table 11.1.1 below.

Table 11.1.1. Observed benefits of shinrin yoku and forest interaction

Finding	Source
<i>Decreased hostility</i>	Morita et al., 2006
<i>Decreased depression</i>	Morita et al., 2006
<i>Increased liveliness</i>	Mao et al., 2012; Morita et al., 2006
<i>Improved sleep</i>	Morita et al., 2011
<i>Improved mood</i>	Hassan et al., 2018
<i>Lowered oxidative stress levels</i>	Mao et al., 2012; Oh et al., 2017; Wang, Yamada, & Miyanaga, 2018
<i>Lowered cortisol levels</i>	Antonelli, Barbierie, & Donelli, 2019; Mao et al., 2012; Park et al., 2009a
<i>Reduced blood pressure</i>	Hassan et al., 2018; Oh et al., 2017; Park et al., 2009a; Park et al., 2009b; Song et al., 2013
<i>Lowered heart rate</i>	Park et al., 2009a; Park et al., 2009b; Song et al., 2013
<i>Decreased anxiety</i>	Hassan et al., 2018; Oh et al., 2017
<i>Strengthened immune function</i>	Li et al., 2008; Morimoto et al., 2008; Oh et al., 2017

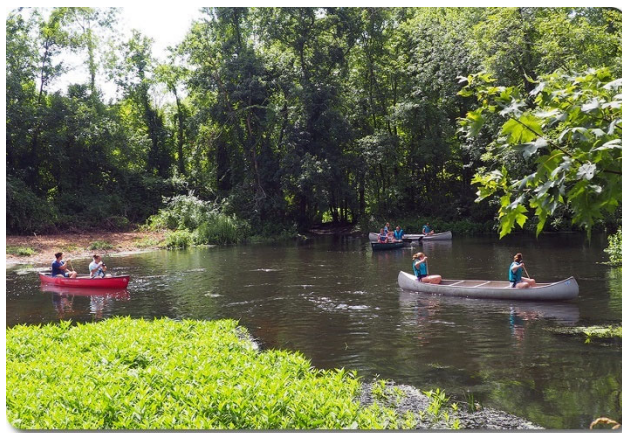
Building on these promising findings, recent studies have begun to focus on forest therapy programs with youth and young adults. In one such study, 29 Malaysian students, aged 21 to 23 years, participated in a half-day program in which they strolled through a forest, soaked in a river, and took an hour of “sensory enjoyment” (i.e., free time) within the surrounding forest environment (Rajoo, Karam, & Aziz, 2019, p. 4). Researchers measured participants’ blood pressure three days before; during; and three, five, and seven days after the program. When compared to the period before program participation, students’ blood pressure levels significantly decreased during forest therapy, with the decrease being maintained three and five days later (Rajoo et al., 2019). By day seven, the participants’ blood pressure levels had returned to normal, indicating that repeated or ongoing exposure to the natural forest environment may be necessary to see prolonged beneficial effects on physiological stress (Rajoo et al., 2019). In other research, Bang and colleagues (2018) created a combined health promotion and forest therapy program for 52 fourth, fifth, and sixth grade students. The program consisted of 10 90-minute weekly sessions, with 30 minutes of health education delivered by nursing students and 60 minutes of urban forest activities. Compared to their peers who attended health, reading and art classes at a community center, children in the forest therapy intervention showed significantly greater improvements in self-esteem and reduced depressive symptoms after their 10-week study participation (Bang et al., 2018).

In addition to research on “green spaces,” such as forest and farm environments, a recent body of literature has examined the potential impacts of interacting with “blue spaces,” including lakes, oceans, and other bodies of water. While most of the current literature in this area is still theoretical in nature (Foley, 2015; Foley & Kistemann, 2015; White et al., 2016), some recent findings are promising. In one study, Dempsey and colleagues (2018) used existing data from The Irish Longitudinal Study on Ageing of over 8,000 older adults living in Ireland. This study included a depression questionnaire and calculated the distance between each respondent’s home and the Irish coastline. Researchers found that those who could most clearly see the ocean

from their home had lower rates of depression (Dempsey et al., 2018). As this was a correlational study, the authors could not demonstrate that the ocean views themselves led to better mental health. However, other studies focused on the well-being effects of urban and residential blue spaces have found similar correlations (Garrett et al., 2019; Nutsford et al., 2015). Moreover, one of the only systematic reviews on the potential healing impacts of water discussed evidence indicating a positive association between greater exposure to outdoor blue spaces – which was defined in various ways, including geographical proximity to, and annual time spent at, the beach – and statistically significant improvements in mental health and physical activity (Gascon et al., 2017). Given this review’s relatively small number of studies ($n = 22$) with differing design protocols, the authors note that further research is needed to support these promising findings (Gascon et al., 2017).

Physical Recreation in Natural Environments

While quiet, relatively inactive interactions with the natural environment – both green and blue – can be beneficial, incorporating physical recreational activity into NEIs may offer additional value. For example, exercise has consistently been associated with higher levels of physical, mental and cognitive health in youth, with outdoor athletic activities being particularly beneficial (McMahon et al., 2017; Mittal et al., 2013). A 2011 systematic review examined 11 studies that compared outdoor and indoor exercise initiatives (Coon et al., 2011). Overall, researchers found that exercising outside in natural environments resulted in greater revitalization; increases in energy; and reductions in tension, confusion, anger, and depression when compared to exercising indoors (Coon et al., 2011). Participants also reported greater enjoyment, as well as a



stronger interest in repeating the physical activity, when exercising outdoors in nature (Coon et al., 2011).

Likewise, the psychosocial benefits of outdoor adventure and wilderness therapies are relatively well-supported by research (see Table 11.1.2).

Table 11.1.2. Psychosocial benefits of outdoor adventure and wilderness therapies

Finding	Source
<i>Decreased symptoms of anxiety</i>	Ekstein & Ruth, 2015; Tucker, Javorski, Tracy, & Beale, 2012
<i>Decreased depression</i>	Ekstein & Ruth, 2015
<i>Decreased symptoms of obsessive-compulsive disorder</i>	Ekstein & Ruth, 2015
<i>Fostered psychological resilience</i>	Bowen, Neill, & Crisp, 2016; Conlon, Wilson, Gaffney, & Stoker, 2018
<i>Improved self-esteem</i>	Bowen et al., 2016; Conlon et al., 2018
<i>Improved sense of self-efficacy</i>	Conlon et al., 2018; Ekstein & Ruth, 2015; Margalit & Ben-Ari, 2014

A recent scoping review of 13 quantitative studies on various adventure therapy programs sought to determine whether specific programmatic factors – such as the therapeutic activity (e.g., ropes course, hiking) or the treatment or group setting – contributed to positive behavioral or emotional outcomes for research participants (Dobud & Harper, 2018). Based on their review, Dobud and Harper (2018) concluded that adventure therapy programs can be “effectively delivered over varying lengths of time, in different settings, and for different populations” (p. 20). Notably, they were unable to identify distinct elements or activities that made some programs more effective than others (Dobud & Harper, 2018, p. 20). Rather, factors such as a positive therapeutic alliance, client expectations of change, and the therapeutic quality of nature itself seemed to be more influential than any particular adventure therapy or NEI/recreational approach (Dobud, 2017; McIver, Senior, & Francis, 2018; Park et al., 2009).

Similarly, a meta-analysis of 22 outcome evaluations of wilderness challenge programs for youth with delinquency issues found that certain therapeutic aspects, such as program length, had a minimal impact on program effectiveness as measured by youth recidivism rates (Wilson & Lipsey, 2000). The greatest improvements resulted from programs that combined outdoor recreational activities with therapeutic approaches such as behavior management, family therapy, or cognitive behavioral therapy (CBT) techniques (Wilson & Lipsey, 2000).

Practice Considerations

Given the unpredictable nature of the environment, NEIs may be influenced both negatively and positively by outdoor surroundings. The process of helping a young client or student respond and adapt to unforeseen events in therapy or via experiential learning can be beneficial if facilitated properly. As such, it is necessary for interventionists to consider the individual needs and abilities of their clients or students before introducing an NEI; to have knowledge of the particular environmental setting (Berger, 2010); to recognize their limited ability to control the environment, and how to use this in ways that will ultimately support the client/student and his or her growth; and to be aware of potential risks and how to manage them effectively.



Similarly, practitioners must carefully consider the client’s or student’s psychological history (i.e., trauma experiences and coping skills) and/or sensitivity to multisensory environments when selecting the NEI setting and activity. However, this should not limit the practice. Indeed, people with differing physical, cognitive, and developmental abilities are able to have an “intimate encounter with the landscape” that can be therapeutic (Berger, 2010, p. 71). This, again, speaks to the adaptability of NEIs to meet the diverse needs of students and clients; for

example, simply sitting beneath a tree for 15 minutes can be just as therapeutic or educational for one individual as taking part in a multi-day hiking excursion is for another (Berger, 2010).

11.2 Overview of Natural Environments Interventions and Recreational Programs at Green Chimneys

While Green Chimneys is recognized as an international leader in animal-assisted interventions (AAIs) and horticultural-based interventions (HBIs), the organization also serves as a pioneer model in NEI practices for children and adolescents with mental health and special education needs. The Green Chimneys Recreation Department conducts these interventions in several outdoor spaces across campus and in the surrounding area, including the Challenge Course (i.e., a high and low ropes course and climbing tower), the Great Swamp, Tom's Trail/the Campus Forest, several athletic fields, and local offsite hiking and camping areas (see *Green Chimneys Campus Map* on page 10 and *Green Chimneys Nature-Based Program Areas* on page 11).



Swimming and other recreational activities are also offered to students and the community at the indoor pool and gymnasium, thereby providing important physical and physiological health benefits for diverse populations.

However, while such indoor activities are valuable, they are distinct from NEIs because they lack the specific benefits of taking place in the natural environment. Of note, Green Chimneys' NEIs (i.e., recreational interventions with clear nature components) are the primary focus of this chapter.

Overall, the Recreation Department operates from the philosophy that interacting regularly with nature is therapeutic, and that these experiences afford students the opportunity to learn about and care for the Earth while developing technical, physical, interpersonal, and coping skills.

Programming within the Recreation

Department has greatly evolved over time as the school and residential life center have grown. Once a traditional physical education (PE) program in a unique setting, this department now intentionally utilizes the natural environment in a wide range of



programs to more fully impact the health and well-being of students and the community.

Notably, the public is welcome to participate in certain recreational activities at Green Chimneys, including swimming lessons for children three years of age and older and Summer Camp for children in PreK-10th grade. According to the *Green Chimneys Adventure Manual* (2017),

Adventure programming at Green Chimneys...is designed to offer day, weekend and residential programs to Green Chimneys students and visiting groups in an effort to promote group socialization skills through outdoor and experiential learning. In an atmosphere that is challenging, supportive and fun, participants learn to problem-solve, to make decisions, to set expectations, and to develop communication skills. In the affective domain they begin to appreciate their strengths and weaknesses, to respect differences within the group, to be involved in the resolution of conflicts, and to trust in themselves and others. Participants are encouraged to take reasonable risks, which is an essential component in the development of self-esteem...the goal of each experience is to bring participants to the realization of who they are, and how to transfer and apply what they have learned to the relationships with their parents, teachers and peers (Green Chimneys, 2017, p. 4).

Green Chimneys' indoor pool and gymnasium were initially constructed in the late 1990s, during major campus expansion efforts. Additionally, the nearly 30-year-old outdoor Challenge Course was renovated in the early 2000s. Over the years, the Department has also acquired various pieces of outdoor recreation equipment (detailed in Section 11.6) for use during NEI

activities at the Great Swamp, Tom's Trail/the Campus Forest, and off-campus wilderness trips. In each of these outdoor locations, Green Chimneys staff and/or interns facilitate NEI therapies, activities and educational programming, with an emphasis on small groups organized according to students' treatment and academic goals. In addition to daytime, after-school, and weekend NEI and recreational programming, the Recreation Department is responsible for the coordination of a number of recreational activities that do not necessarily include nature (e.g., yoga class, fabrics club, board games), all special community and holiday events, and student talent shows.

11.3 Certifying Bodies

American Camp Association – Green Chimneys' Summer Camp is accredited through the American Camp Association. This certifying body collaborates with youth-serving experts – such as the American Red Cross and the American Academy of Pediatrics – to set research-based standards for camp operations, with a special focus on health, safety, and risk management policies. Initial accreditation requires camp site visitations and written documentation of all camp programming and procedures. To maintain accreditation, Green Chimneys must agree to comply with all new and existing American Camp Association standards on an annual basis, and host an onsite visitation from the Association every three to five years (American Camp Association, 2019).



To provide common summer camp activities like archery, Green Chimneys ensures that it follows strict safety and risk management guidelines.

American Red Cross – All Recreation Department staff members and lifeguards must be trained and certified in First Aid, Cardiopulmonary Resuscitation (CPR), and Automated External

Defibrillator (AED) for Professional Rescuers through the American Red Cross. Likewise, each Recreation Department staff member is required to renew these certifications annually, which is coordinated and paid for by Green Chimneys.

Association for Challenge Course Technology – The Director of Recreational Services (see Section 11.5 for more information) and his or her team manages and maintains the safety and proper operation of the Challenge Course and all other recreational equipment. This includes ensuring that all ropes course and climbing tower equipment meets the safety and operational standards set forth by the Association for Challenge Course Technology.

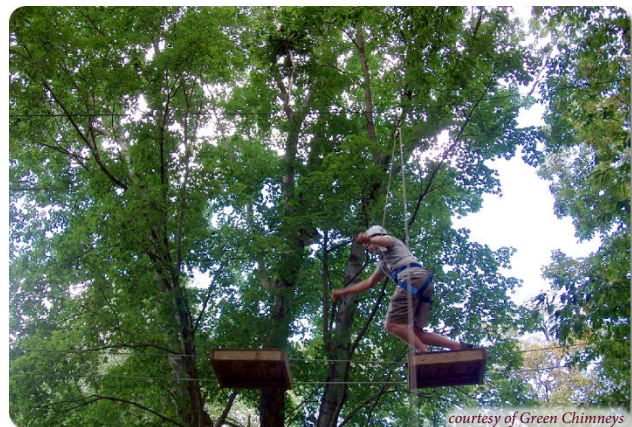
National Council for Therapeutic Recreation Certification – Certified Therapeutic Recreation Specialists are recognized by the National Council for Therapeutic Recreation Certification after they have successfully completed a bachelor’s degree or higher in a relevant field (e.g., Therapeutic Recreation and Health Studies), a 560-hour minimum internship, and the certification exam. This certification is the only nationally-recognized achievement of professional standards for Therapeutic Recreation Specialists, who are required to renew their certifications annually and to reapply for certification every five years (National Council for Therapeutic Recreation Certification, 2019). At Green Chimneys, “Therapeutic Recreation Facilitators” are either Therapeutic Recreation Specialists (certified through the National Council) or Licensed Creative Arts Specialists (see Section 11.5 for more information).

New York State Education Department – Creative Arts Therapists (i.e., art and drama therapists) and PE teachers at Green Chimneys must be licensed through the New York State Education Department (NYSED), which requires professionals to meet specific education, experience, and examination criteria (NYSED, 2019a; NYSED, 2019b).

11.4 General Policies, Practices, and Procedures

At Green Chimneys, every student must take at least one PE and Health class (or approved out-of-school activity) per year, as required by NYSED per Education Law 803 and Commissioner's Regulation 135 for K-12 students (NYSED, 2019b). However, in accordance with NYSED and the Individuals with Disabilities Act (IDEA), accommodations are made for students who have physical or medical conditions that prevent their participation in certain activities, as indicated in their individualized education program or IEP (The University of the State of New York, 1997). In such cases, Green Chimneys provides adapted PE, or "a specially designed program of developmental activities, games, sports, and rhythms suited to the interests, capabilities, and limitations of students" (The University of the State of New York, 1997, p. 4). For example, if outdoor swimming or boating activities are contraindicated by a student's seizures, ground-based recreational activities are offered to ensure that he or she has the opportunity to engage in NEIs. Similarly, if a student with sensory sensitivities feels overstimulated by the noise and activities taking place in the indoor gymnasium during PE class, he or she may have the option of moving outdoors and engaging in a physical activity or game with staff and/or peers in a less overwhelming environment.

Beyond PE and Health classes, students may participate in a variety of on- and off-campus NEIs through Green Chimneys' adventure programming. These programs often subscribe to a "Challenge by Choice" philosophy, empowering students to "seek their own level of challenge" without coerced participation (Green Chimneys, 2017, p. 28). For example, on any given day, a student



A student faces his fears to conquer a high ropes element, an implementation of the Recreation Department's guiding philosophy of "Challenge by Choice."

with a fear of heights may choose to challenge him- or herself by participating in a high ropes course or opt to engage in a course that is lower to the ground. However, members of the student's treatment team (e.g., a social worker and nursing staff member) must first approve the student's participation in the overall activity to ensure that he or she will not pose a safety risk to him- or herself or others by participating.

Of primary importance, and thus reflected throughout the policies and procedures implemented by the Recreation Department, is the safety of students, staff, and the community during NEI participation. Each program area and setting within the Department adheres to activity-specific guidelines that align with industry standards and meet the needs of Green Chimneys' student population. During all interventions held on campus, staff carry walkie-talkies to communicate with each other in the event of an emergency. If any individual is in crisis or danger, staff and interns are expected to be aware of their surrounding environment, adhere to Therapeutic Crisis Intervention guidelines, and ensure that students remain in, or move to, a safe and secure area.

Staff who oversee any water-based activity must be certified by the American Red Cross in CPR/AED. Additionally, outdoor water-based activities must be supervised by staff with a Waterfront Lifeguard Certification. Aquatics Instructors are also required to complete the American Red Cross Water Safety Instructor Course, which includes an online and classroom/pool component, as well as a written exam (see Section 11.5). Moreover, all students who participate in outdoor or indoor aquatic activities must wear a life vest and be supervised by at least one American Red Cross-certified lifeguard at all times while in the water.

Policies and practice guidelines for each element of the Challenge Course, including the ropes course and climbing tower, are outlined in the *Green Chimneys Adventure Manual* (Green Chimneys, 2017), and closely follow the standards set forth by the Association for Challenge Course Technology (2016). Per these standards, Recreation Department team members must

complete corresponding certification courses in order to provide appropriate supervision and education to students working through various levels of the Challenge Course. For example, several staff have completed an 8-hour course to learn how to belay students who are completing a route on the climbing tower or an upper portion of the ropes course. Moreover, a smaller group of staff have completed advanced courses that certify them as Level 1, 2, or 3 instructors, meaning they may directly support student participants seeking to complete more advanced components of the ropes course and/or conduct rescues as necessary (i.e., a rescue often entails retrieving a student who changes his or her mind prior to advancing to a more difficult element at the top of the ropes course).



All youth participating in adventure programming off-campus must first be cleared by members of their treatment team and nursing staff, must have demonstrated successful participation in previous therapeutic and/or educational recreation activities on-campus, and must not pose a

safety or health risk to themselves or others. Prior to taking a group of eligible students off-campus for adventure programming, the lead Therapeutic Recreation Facilitator is required to complete a Therapeutic Recreation Program Plan and submit the form to the Recreation Department Supervisor and the Director of Recreational Services for approval (see Section 11.5).

This detailed plan:

1. *Includes the location and scheduled dates of the outing*
2. *Identifies the number of staff and youth who may participate*
3. *Outlines the outing's primary goals and objectives*
4. *Explains how staff will meet these identified goals and measure success*

5. *Lists all resources (e.g., materials, equipment, transportation or recreation vehicles, camping gear, food, purchase orders, facilities, and student medication) needed for the outing*
6. *Describes the emergency plan for the outing, including any training sessions staff or students must complete before participating*

At least two days prior to the approved outing, the lead Recreation Facilitator must also use Green Chimneys' *Recreation Off-Grounds Pre-Trip Itinerary* to record the outing's logistical details, including the names of students and staff who will be participating, the planned departure and return dates/times (outings typically range from a few hours to four days in length), and any petty cash requests for purchases that need to be made prior and during the trip. In addition, recreation staff coordinate with the kitchen for any needed food (according to student dietary restrictions) and consult with the Health Center to ensure each child's medications are packed appropriately. In order to avoid as many disruptions and/or emergencies as possible, the Recreation Department ensures proper staff-to-student ratios, provides necessary safety gear and first aid supplies, and prepares students physically and emotionally for any potential challenges they might face during the outing (Green Chimneys, 2017).

11.5 Staffing

The transdisciplinary team of staff, interns, and volunteers in the NEI Program and Recreation Department represents a variety of professional experiences and specializations – from certified PE to licensed creative arts therapy to aquatic instruction. Similar to other program area staff across campus, ensuring the safety of students and members of the public during outdoor and physical activities is a primary responsibility of all recreation personnel, as is supporting respectful and ethical engagement with the natural environment.

Director of Recreational Services – Primarily, the Director of Recreational Services is responsible for the design, implementation, and evaluation of all recreational and aquatics programming, including on- and off-site activities, Summer Camps, and community events. Supervised by the Associate Executive Director of Green Chimneys, this individual also oversees daytime, after-school, evening, and weekend NEI programs for all students. Other major responsibilities include providing supervision for staff who manage NEI and Recreational Programming (i.e., therapeutic recreation, adventure and wilderness programming, and recreation and outdoor education), and working with colleagues and members of the community to coordinate Birds of Prey Day, Little Folk Farm Day, and other public events. Historically, individuals in this position have held a bachelor’s degree in recreation management or a Certified Recreation Therapist Specialist certification, with considerable work experience in residential and therapeutic day programs.



Recreation Department Supervisor – The Recreation Department Supervisor reports to the Director of Recreational Services and is responsible for: (a) organizing all NEI and other recreational programming, (b) helping to support recreation staff in their various roles, and (c) ensuring the smooth and proper execution of program activities. This individual also provides clinical supervision for Green Chimneys’ Therapeutic Recreation Facilitators (see below), including all Therapeutic Recreation Specialists and Creative Arts Therapists. Due to the clinical nature of this position, the Recreation Department Supervisor must hold a bachelor’s or master’s degree in therapeutic recreation, art therapy, or an acceptable equivalent.

Administrative Assistant – The administrative assistant is supervised by the Director of Recreational Services and is responsible for the planning and coordination of all special events at Green Chimneys’ main campus. This individual also manages the marketing and coordination for the pool, gym and other on-campus rental sites (e.g., a beach pavilion, barbeque area, and conference room), and generates purchase orders for recreation and public programming. This position requires a bachelor’s degree, as well as a minimum of three to five years of experience coordinating public programs and events.

Creative Arts Therapeutic Program Facilitator – This individual reports to the Director of Recreational Services, and must hold a bachelor’s or master’s degree and corresponding licensure in Creative Arts Therapy, Dance Therapy, Music Therapy, Movement Therapy, or Drama Therapy. The Creative Arts Therapeutic Program Facilitator also coordinates and schedules the after-school, evening, and weekend recreation programming with members of the residential life staff. These programs include: (a) performing arts- and creative arts-based activities, (b) team building and adventure activities, (c) athletic and gym activities, (d) aquatics and pool activities, (e) therapeutic recreation and group socialization activities, and (f) special events.

Therapeutic Recreation Facilitators – Green Chimneys’ Therapeutic Recreation Facilitators may be Certified Therapeutic Recreation Specialists or Licensed Creative Arts Therapists specializing in visual art, dance/movement, music, or drama. These three individuals are responsible for designing and implementing customized



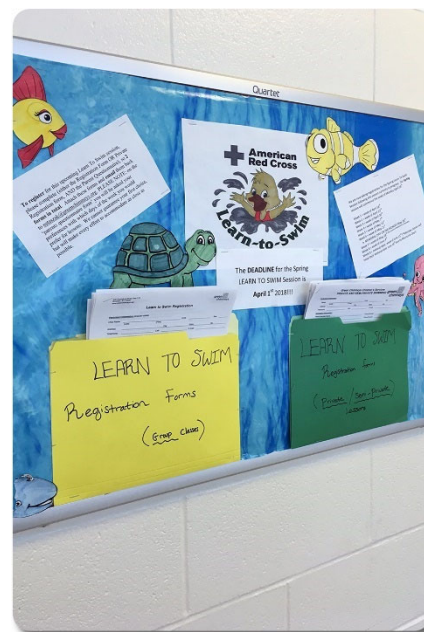
Therapeutic Recreation Facilitators partner with Wildlife Program and Teaching Barn Interns to provide support and engaging nature-based recreational activities during Birds of Prey Day.

therapeutic recreation programming – such as yoga, botanical illustration, and knitting – for groups in residential care and for individual clients on their caseload. Therapeutic Recreation Facilitators also provide intern supervision and diversional leisure activities for students, such as team-building exercises and engaging games for youth within the dorm setting.

Adventure Program Coordinator – The Adventure Program Coordinator leads all programming that takes place at the high ropes course, low ropes course and climbing tower, as well as boating activities at the Great Swamp. Additionally, this individual oversees the coordination of all adventure programming for Green Chimneys students, including: (a) team building activities, (b) camping trips, (c) athletic and gym activities, (d) aquatics and pool activities, (e) creative arts, (f) diversional programs, (g) therapeutic recreation, and (h) group socialization activities. This individual also manages all training for staff who utilize the Challenge Course facilities. The Adventure Program Coordinator must have at least five years of experience in adventure programming, including high and low ropes courses, rock climbing, hiking, and boating.

Physical Education Teachers – PE Teachers at Green Chimneys are primarily involved in day school programming, such as gym and health classes. These individuals also contribute to the planning and implementation of many outdoor activities within the scope of both academic PE requirements and therapeutic interventions, including the development of monthly lesson plans. Each teacher has his or her own area of focus, such as outdoor education (this person is known as the “Outdoor Educator”), aquatics (see the “Aquatics Instructor” description below for more details), and indoor gym activities. The PE teachers report to the Director of Recreational Services and to Green Chimneys school administrators and must hold New York State teaching certifications.

Supervisor of Aquatic Programming – This individual oversees the operations of the Aquatics Program, and provides supervision for the Aquatics Instructor, the Aquatics Public Program Coordinator, and all lifeguards (see below). In addition, this person manages the care of the aquatic facilities by scheduling necessary maintenance and repairs, ordering pool supplies and equipment, and ensuring that all safety requirements are adhered to. Additional responsibilities include creating pool and employee schedules for aquatics staff, as well as coordinating and teaching certification courses for lifeguards.



Aquatics Instructor – The Aquatics Instructor (also considered one of the three PE teachers; see above) is required to complete the Water Safety Instructor Course, and to be certified in CPR/AED, with the American Red Cross prior to his or her first day of employment at Green Chimneys. In addition, he or she must be trained in the operation of small watercraft. Primary responsibilities include teaching students how to swim and participate in a variety of water-based activities, including boating, canoeing, kayaking, and paddle boarding. Aquatics Instructors must also be able to assess the swimming abilities of students and fellow staff while managing lifeguard duties during indoor and outdoor swim periods. Moreover, these individuals supervise all lifeguards, and manage daily tasks related to pool and water equipment maintenance. The Aquatics Instructor reports to the Supervisor of Aquatic Programming, the Director of Recreational Services, and Green Chimneys school administrators. Additionally, he or she must hold a New York State teaching certification in PE.

Aquatics Public Program Coordinator – This person is responsible for organizing safe and effective water-based programming for members of the local community, with beginner swimming classes (“Learn to Swim”) being the primary programmatic focus of this role. This individual is also responsible for managing the public open swim program, as well as conducting lifeguard certification courses for community members. Aquatic facilities are used for public open swim on Tuesday and Thursday evenings and Sunday mornings, while “Learn to Swim” classes take place five evenings per week (with specific days/times varying by season).

Lifeguards – Lifeguards are responsible for ensuring the safety of students, staff, and community members who use Green Chimneys’ pool facility and/or engage in outdoor water activities at the Great Swamp adjacent to campus and at the lake located at the Clearpool campus. In order to serve in this capacity, these individuals must have successfully completed the following certification courses: (a) the American Red Cross Lifeguard Training and (b) the American Red Cross CPR/AED for Professional Rescuers and Health Care Providers Course. Lifeguards report directly to the Aquatics Instructor.

Recreation Interns – Up to three Recreation Interns are responsible for helping to facilitate day school recreational activities, while also assisting staff with after-school programs, evening groups, off-campus trips, and special events. Interns participate in Green Chimneys staff trainings, which cover all aspects of adventure programming, First Aid and CPR/AED certification, and Therapeutic Crisis Intervention. Intern supervision is provided weekly by a Therapeutic Recreation Facilitator.

NEI and Recreation Program Volunteers – Numerous community volunteers contribute to special events hosted by the Recreation Department, such as Birds of Prey Day, as described further in Section 11.7. Additionally, groups of volunteers occasionally come to campus and

conduct maintenance on the Challenge Course, including clearing out overgrowth and putting down wood chips. Parent volunteers also serve as chaperones for off-campus adventure programming or during campus events.

11.6 Facilities and Tangible Resources

The following describes the Recreation Department's main facilities, environments and resources, with an emphasis on those located or used outdoors in nature for the provision of onsite NEIs.

Facilities & Fields – The Recreation Department is responsible for the management of an indoor gymnasium and swimming pool, and three outdoor athletic fields. One field is used primarily for outdoor sports (e.g., softball, soccer, football, kickball, and tetherball), while a wide variety of outdoor recreation and PE activities (e.g., various games, yoga, and tai chi) take place on the second field. The third field, located directly in front of the Horse Barn, is primarily used for summer camp activities.

Motorized Vehicle – The Recreation Department is responsible for one 12-passenger van that is used for off-campus excursions, such as hiking, camping, skiing, swimming, or catch and release fishing trips. Recreation staff must possess a valid Class E driver's license in order to operate the van.

Equipment – Through purchase or via donation, Green Chimneys has acquired numerous pieces of outdoor sporting and recreation equipment/resources to use during a variety of NEIs, including:

- 20 kayaks
- 15 canoes

- 10-15 hammocks
- 4 paddle boards
- Winter gear (e.g., snowshoes, sleds, ski and snowboard equipment)
- Camping equipment (e.g., tents, sleeping bags, chairs, cooking equipment)
- Catch and release fishing gear (e.g., nets, poles, non-barbed hooks)
- Ropes course equipment (e.g., ropes, carabiners)
- Climbing equipment (e.g., static and dynamic ropes, harnesses, auto-belay systems, carabiners)
- Sporting equipment (e.g., basketballs, soccer balls, footballs, cones)
- Other recreation equipment (e.g., Frisbees, hula hoops, jump ropes, yoga mats)

Recently, Green Chimneys also acquired specialized climbing equipment and devices that optimize the use of the Challenge Course and the students' experiences during this NEI:

Upgraded Technology Leads to Enhanced Therapeutic Recreation

"New technologies in climbing hardware have come out in the last 4-5 years that have transformed ropes courses and how they are facilitated in general. Before, it was dictated by how many facilitators we had. We would have a participant on a rope, with a facilitator on the other side of that rope. A participant would go up the tree, do the element, then come down the other side. This was still fun, but the facilitator was on the ground away from the child [while] trying to talk them through the challenge. We upgraded to using something called a SmartSnap System 3 years ago. This system lets us have 6-8 people in the air, on the course at one time. Now the participants go up the tree, do 5 elements, and come down the zip lines. We have facilitators in the trees with them, counseling and guiding them through, and the whole experience is transformed by this simple double-sided auto-locking carabiner."

(Z. Staszak, personal communication, April 29, 2019)

Ropes Course & Climbing Tower (the Challenge Course) – The outdoor Challenge Course spans about an acre and is located directly behind the Teaching Barn on Green Chimneys' main campus (see *Green Chimneys Campus Map* on page 10). Both the ropes course and the 40-foot climbing tower are used for team-building and athletic exercises with children and youth throughout the school year and during Summer Camp sessions. Each student participant receives training from a certified recreation staff member prior to engaging in supervised ropes

course or climbing tower activities. A recently donated statue of a black and white steer stands on the landing on top of the climbing tower, serving as both an inspiring goal for students to reach and a creative safety measure to limit prolonged activity on the high platform.

The Great Swamp – Located across the street from the main Green Chimneys campus, the Great Swamp is utilized for many recreational purposes. The swamp is one of the largest public wetlands in the state of New York, extending about 20 miles north of campus and covering almost 6,000 acres (Friends of the Great Swamp, 2016). The Great Swamp not only provides an ideal



Beach access to the Great Swamp allows for easy canoe and kayak launching, as well as a built-in outdoor laboratory to examine water quality and observe wildlife in their natural habitats.

environment for kayaking and canoeing, but it also serves as an engaging and natural subject for environmental study among Green Chimneys students. The swamp's marshes and bogs are critical components of the local ecosystem, improving water quality and recharging the aquifer, reducing flooding, and providing a home to a diverse array of plant and animal species.

Tom's Trail/the Campus Forest – Tom's Trail is a nature walk through a semi-wooded area that borders the Green Chimneys campus and is open to the general public year-round. Staff and students often stroll the trail in order to take a break from their work and to enjoy their natural surroundings, while clinicians may opt to use the trail during a therapy session with a student. The trail also runs adjacent to horse and cow paddocks, providing visitors with an opportunity to observe non-human animals in addition to flora (see *Green Chimneys Campus Map* on page 10).

11.7 Community Engagement with Natural Environments Interventions at Green Chimneys

Green Chimneys is dedicated to engaging the public in various aspects of its AAI, HBI, NEI, and recreational programming. Below are three primary ways the Recreation Department serves and partners with the local Brewster community.

Public Aquatics Program – The Public Aquatics Program provides a variety of services and classes to the local community. For example, children and adults of all ages may enroll in Green Chimneys’ “Learn to Swim” program or use the indoor pool for open swim three times per week. Additionally, lifeguard certification and recertification courses are offered regularly to both Green Chimneys staff and members of the community through this program.

Special and Community Events – As mentioned earlier, the Recreation Department (particularly the Director of Recreational Services and the Administrative Assistant) coordinates and hosts all special, public, and holiday events at Green Chimneys, such as Birds of Prey Day and Senior Day. Of note, volunteers from the community are integral to the success of these events. During Birds of Prey Day, volunteers often oversee logistics, direct visitors to the Wildlife Center, and help setup and breakdown stations, including tents and equipment. Additionally, community volunteers, as well as Green Chimneys student volunteers, are involved in the facilitation of Senior Day, an event hosted in partnership with the Brewster Council on Aging. During this event, volunteers assist over 100 older adults from the community as they engage in hay rides, square dancing, and other appropriate farm-related activities. Often, between 60-70 volunteers from large corporations like Viacom and Goldman Sachs participate in these special events as well.

Summer Camp – Children and youth from the local community, aged 4-15 years, participate in full-day Summer Camp activities each year, either at the Green Chimneys Clearpool campus or

the Hillside location across the street from the main campus in Brewster. Three camp sessions, each lasting three weeks, occur alongside regular programming for Green Chimneys residents. The Recreation Department is key to the operation of Summer Camp, as many spaces used for camp activities are shared with the NEI and recreation programs. Additionally, the Director of Recreational Services is responsible for training all camp staff/counselors prior to the start of the nine-week Summer Camp season in late June or early July.



11.8 Ethical Considerations of Environmental Impact and Sustainability

The Recreation Department carefully considers the potential and ongoing impacts of their programs, facilities, and equipment on the natural environment. During all NEI activities, students are expected to adhere to the principles of “Leave No Trace.” For example, before leaving a camping or hiking site, youth must remove all trash and carry it with them back to campus. Likewise, no one is allowed to take pieces of the natural environment (e.g., rocks, flower stems, leaves) with them after participating in NEI activities.

11.9 Natural Environments Interventions and Recreational Programming as Contexts for Positive Youth Development

NEI and recreational programming at Green Chimneys provides a strong context for SEL and positive youth development (PYD), encouraging students to interact with nature in thoughtful, personal, and mutually beneficial ways. Through diverse recreational activities, youth develop skills related to emotional regulation, confidence, self-care, and relationship-building in a variety of outdoor settings. Taken together, these joyful experiences enrich the respectful

connections students share with the natural environment, which may also have broad impacts on their social-emotional, cognitive, and physical development.

The *Big Three* in the Recreation Department

Positive and sustained relationships between youth and adults – While some recreational NEI activities are intentionally solitary, such as “bathing” in the Campus Forest or walking alone in a



Students must collaborate with each other and with their Rec Department facilitators to master the Challenge Course's 40-foot climbing tower.

pasture to alleviate stress, the majority occur in groups or teams where the guidance of a trusted adult mentor is imperative. During activities such as canoeing or climbing a 40' tower, students must rely on facilitators who not only show interest in their progress, but also provide helpful instruction, supervision, and support over the course of the activity. When students succeed in accomplishing their personal goals or mastering challenging tasks, the bonds they share with their adult mentors and peers often grow stronger. Likewise, such achievements may lead to increased student self-regard and collaboration with adult staff, including assisting fellow students with navigating various NEI activities and settings.

Activities that build important life skills – Many of the activities within the Recreation Department incorporate important life skills, such as appropriate social interaction, communication, teamwork, problem-solving, decision-making, and self-awareness. For example, when students participate in the Challenge Course, they must focus and follow instructions, collaborate with their peers, commit to completing the course in full (or to the best of their ability), and provide assistance to others when necessary. When the group achieves a goal, wins a game or finishes a demanding task, students are able to acknowledge their

contributions and those of their teammates. Conversely, experiencing a disappointment during an activity helps students recognize where more work is needed, and supports the development of important coping skills that can be leveraged throughout their lives. In addition, as environmental or weather conditions may change abruptly during the course of any given NEI, students must also learn to assess their surroundings, determine any risk factors, and make responsible decisions based on their observations, judgment, and unique skill sets.

Opportunities for youth to use life skills as participants in, and leaders of, valued community activities – Youth at Green Chimneys have numerous opportunities to use the life skills they acquire through NEIs and other recreational programming to contribute to valued community activities. For example, by challenging themselves physically on a long hike, youth may gain confidence in their ability to make decisions, accomplish goals, and lead others in executing an important task. These students may then feel self-assured to assume leadership roles during community events hosted by the Recreation Department, such as Birds of Prey Day and Senior Day. Indeed, youth leaders often provide information to visitors about the campus and its inhabitants, help staff facilitate certain activities, and offer guidance to their fellow students and the public during such events.

The *Five Cs* of PYD in the Recreation Department

Competence – During NEIs, students receive instruction and supervision from Therapeutic Recreation Facilitators and/or the Outdoor Educator/PE teacher. Once the staff member feels the student is able to engage in an activity safely and independently, students are given the opportunity to try it “on their own” (i.e., with supervision but little to no guidance). For example, Recreation staff may provide one-on-one paddle boarding instruction to a student, and co-paddle with them until the student is ready to balance on the board and paddle independently. Throughout the entire teaching process, expert instructors provide students with

knowledge and skills regarding the equipment and how to interact appropriately with the environment. Through practice, repetition and encouragement from an adult guide, students gain *competence* in a variety of outdoor recreation activities.

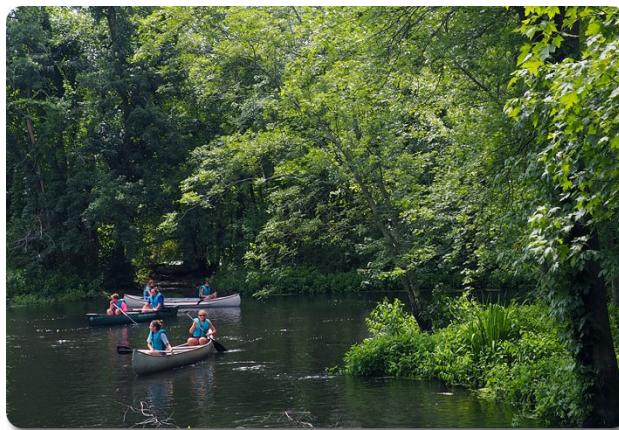
Connection – As discussed above, NEIs and other recreational activities at Green Chimneys primarily involve small groups or teams of students supervised by one or two instructors. This close-knit structure allows students to form meaningful *connections* with each other and staff through effective communication, mutual encouragement, and working together towards achieving a shared goal. By engaging specifically in outdoor activities, students are also able to connect with, and gain an appreciation for, the natural environment. Arguably, connecting with nature may be particularly profound in quiet moments, such as NEIs where a single individual is simply resting on a lake’s shore or observing sparrows under the shade of a tree.



The Challenge Course is built with low elements (i.e., the platform, tire, & low wire) and high elements (i.e., the ladder bridge) to accommodate each student’s developing competence and self-confidence.

Confidence – Through NEI programming, Green Chimneys offers students diverse opportunities to engage in new and often challenging activities, thereby building their *confidence* through increased knowledge and accomplishment. Feeling confident in newfound skills, whether they be wilderness survival tactics or crochet patterns, is empowering for youth, especially for those who tend to struggle with self-doubt. Moreover, youth who feel confident in their abilities often lead recreational and other learning activities on campus and may serve as mentors for fellow students in need.

Character – Although outdoor recreational activities at Green Chimneys mostly take place in groups, students are responsible for managing the care and maintenance of their own assigned equipment (e.g., lacrosse sticks, sports balls). This responsibility encourages youth to act with integrity and within the rules and norms of the Recreation Department, thereby building *character*. Likewise, given the considerable diversity and adaptability of NEIs, students learn how to behave respectfully toward the environment according to the individual characteristics of each natural setting. For example, students are expected to “leave no trace” of themselves by diligently removing all trash, food items, and personal belongings from hiking trails and camping sites. By teaching youth to conscientiously consider and protect the sustainability of the natural environment, staff encourage students to behave just as thoughtfully in the future and in other settings.



Caring – Students have distinct opportunities to develop and demonstrate empathy for others and the environment through participation in NEIs and other recreational programming. Teamwork and sportsmanship are emphasized throughout all relevant activities, with students often providing support for other youth who strike out, miss a goal, or lose their balance. As a result, peer relationships often grow stronger through *caring* and compassion. Likewise, no matter the activity, all Green Chimneys students and staff are expected to care for the natural environment, including on campus, at the Farm, and in the wilderness.

11.10 Natural Environments Interventions in the Recreation Department

At intake, each new Green Chimneys student completes a recreational therapy assessment, which allows recreation staff to match youth with programs and activities based on their

primary interests, needs, and abilities. As discussed previously, some of these activities may take place indoors, such as swimming in the pool, playing floor hockey in the gymnasium, or knitting and playing board games in various buildings across campus. While these impactful programs are important components of the Recreation Department, they are not considered NEIs and, therefore, will not be discussed at length in this section.

Natural Environments Therapies in the Recreation Department

Clinical group time – Taking place from 4 to 6pm daily, several therapeutic day program and all



residential students participate in clinical group time immediately following their after-school activities (described below under “Natural Environments Activities in the Recreation Department”). These clinical groups are co-facilitated by a Therapeutic Recreation Facilitator, the Creative Arts Therapeutic Program Facilitator and a social worker, who work together to assign students to groups based on their treatment goals and individual interests. These groups involve active outdoor activities and focus on treatment goals such as team-building, social-emotional skill

building, and anger management through engaging students in team sports or other physical activities (e.g., yoga or tai-chi).

Specialized groups – From 6 to 8pm each day, all residential students participate in specialized clinical groups that are co-facilitated by staff from the Recreation Department, including Therapeutic Recreation Facilitators, the Creative Arts Therapeutic Program Facilitator, and the Director of Recreational Services. Group sessions often include components of traditional therapeutic groups, including an opportunity for facilitators to “check-in” with students at the beginning of the session (i.e., by asking students to briefly verbalize how they are feeling or how

their day was), as well as a closing whole-group discussion where students can share their creative work or accomplishments with one another.

Specialized groups are structured to support client treatment goals through engagement in a creative or social activity. For example, during “Therapeutic Theater” group, students have the opportunity to write and perform their own stories, which helps strengthen communication and self-awareness skills, and allows youth to use creativity to express their emotions or unresolved issues. During “Tea Time Social Hour” group, students drink homemade tea and listen to calming music in the Greenhouse while building positive social relationships with peers in a safe space designed to emulate the environment of a coffee shop. As specialized group offerings change seasonally due to cooler weather limiting outdoor activities, students are able to select new groups three times per year (i.e., in the spring, fall, and winter).

Individual therapy – Therapists, including social workers and Therapeutic Recreation Facilitators, use the natural environment as a setting for their individual psychotherapy and recreational therapy sessions with students. For example, clinicians may opt to conduct their sessions with students while taking nature walks around campus, or while sitting on a bench overlooking an open meadow. These therapeutic approaches and environments allow for rapport-building and increased communication between the therapist and the student.

In addition, children and youth may also receive art therapy sessions within the Recreation Department. Working with a student on an important art or craft project, such as finger painting or taking photographs of resident animals and the outdoor landscape, allows a Therapeutic Recreation Facilitator (who is often a Licensed Creative Arts Therapist) to build trust with the student, as well as encourage his or her creative passions and self-expression. In order to create an indoor setting with natural and living elements that is regulating to students

(i.e., “biophilic design”), work stations in the art room are situated close to windows and a large freshwater fish tank. Moreover, when the weather and other circumstances permit, art therapy sessions take place outside so that students may engage in imaginative ways with Green Chimneys’ natural environment.

Natural Environments Activities in the Recreation Department

After-school activities – Led by school or Residential Counselors, several after-school natural environments activities are offered daily from 3 to 4pm to both therapeutic day program and residential students. A wide variety of programming is available to students, ranging from physical activities like soccer or football to less intense recreational activities like yoga, knitting, improv comedy, reading and discussing books, and board games. Students may also choose to participate in programming within other areas of campus, such as the Garden Club (see Chapters 9 and 10), Music Club, Dog Club (see Chapter 7), Art Club, or Culinary Club. Whenever possible, these groups are held outdoors across Green Chimneys’ various nature-based program areas and environments.

Natural Environments Education in the Recreation Department

Physical and Health Education – Green Chimneys’ Recreation Department is responsible for the implementation of PE and Health classes for both therapeutic day program and residential students. PE teachers create lesson plans for both classes that (a) follow the NYSED PE curriculum and standards, and (b) support knowledge and skill development so that students can participate in athletic activities and maintain a healthy lifestyle (NYSED, 2019b). PE and Health are required quarterly subjects for all Green Chimneys students, with adaptive programming available for students in need of alternative options. While Health classes take place in traditional classroom settings and include topics like sexual education and healthy nutrition, PE classes often occur outdoors and include a variety of sports (e.g., track and field)

and games (e.g., tag, frisbee) that promote the importance of physical fitness, recreational play, and the natural environment for children and youth.

Environmental Education – At Green Chimneys, students have multifarious opportunities to learn about and within the natural environment. The Outdoor Educator/PE teacher, Wildlife Teacher, and Farm Science Teacher incorporate environmental education topics into their daily lessons to teach youth about the biological, physical, and geological processes that take place within diverse ecosystems.



Located near the Challenge Course and the Tower paddock, the Outdoor Classroom is utilized for Adventure Program briefing and debriefing but is available for use by all Green Chimneys staff.

Moreover, several of these classes utilize or incorporate natural resources on campus to offer students hands-on and experiential learning opportunities. For example, a class might assess the water quality at the Great Swamp or discuss biodiversity during a walk through the Campus Forest. Additionally, all off-campus adventure programs within the Recreation Department include an educational focus on respectfully engaging with the natural environment, such as teaching youth responsible wilderness survival skills and Leave No Trace practices (see above).

11.11 Summary

Whether through quietly observing an autumn leaf or hiking through challenging mountain terrain, interacting with nature can improve our physical wellness, restore our focus and attention, ease our emotional pain and worry, provide joy and fulfillment, and enrich our ability to learn. At Green Chimneys, NEIs and other outdoor recreational programs offer students diverse opportunities to connect with the natural environment in ways that support their social-

emotional, cognitive, and physical development. Due to their highly adaptable nature, NEIs may be particularly beneficial for youth with varying health and learning needs. For example, an NEI session or activity will likely be beneficial regardless of length, intensity, or setting (i.e., a soccer field vs. a secluded wooded area). As such, recreational and other staff at Green Chimneys ensure that students are able to participate in NEIs that are aptly suited to their individual abilities, interests, and therapeutic and educational goals.

Natural settings also provide an ideal context for both PYD and SEL. For example, through physically challenging outdoor activities, youth often connect with adult mentors and peers as they work together to accomplish a common goal. Reaching the top of a climbing tower requires youth to apply such important life skills as hard work, constructive communication and decision-making, often resulting in meaningful feelings of competence and confidence. Likewise, connecting more softly or one-on-one with nature – such as watching the sunrise, creating a landscape painting, studying the root structure of a tree, or walking across a hushed stream – is not only a form of emotional regulation and self-care for many youth, but could also lead to the student taking tangible steps toward caring for the Earth. Ultimately, such experiences help build empathy and character, and may positively contribute to environmental sustainability. When implemented with thoughtful consideration for students and the natural environment, NEIs can have broad and transformative impacts for both.

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