



Ithaca College Natural Lands Management Plan

Adaptive Management for Ithaca College's Protected Natural Areas

2nd Edition

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Table of Contents

- I. Executive Summary
- II. Introduction
 - II.a. Location
 - II.b. Management History
 - II.c. Administration and Governance
 - II.d. Management Values
- III. South Hill Natural Area East
 - III.a. Location and History
 - III.b. Features
- IV. South Hill Natural Area West
 - IV.a. Location and History
 - IV.b. Features
- V. Bob Robinson Family Preserve
 - V.a. Location and History
 - V.b. Features
- VI. Ithaca College Natural Resource Reserve
 - VI.a. Location and History
 - VI.b. Features
- VII. Proposed Activities
 - VII.a. Changes in Landholdings
 - VII.b. Invasive Species: Pests and Disease Management
 - VII.c. Educational Use and Outreach
 - VII.d. Research
 - VII.e. Monitoring and Managing Impacts
 - VII.f. Expanding Volunteer Engagement Opportunities
 - VII.g. Neighbor Relations
 - VII.h. Waste Management
 - VII.i. Climate Change
 - VII.j. Hunting and Fishing
 - VII.k. Logging
 - VII.l. Mineral Extraction:
 - VII.m. Iterative Review of this Management Plan

IX. Conclusion

Appendix A: Maps

Map 1. Ithaca College's landholdings in the Finger Lakes Region of central upstate New York. ICNL reserves are part of the larger "Emerald Necklace" conservation initiative.

Map 2. The four reserves of Ithaca College Natural Lands within Tompkins County, New York.

Map 3. South Hill Natural Area East.

Map 4. South Hill Natural Area West.

Map 5. The Bob Robinson Family Preserve and the Natural Resource Reserve in Newfield.

Appendix B: Management Decision Flowchart

Appendix C: Courses that Use the ICNL System

References

Foreword

The 1st Edition of this document (2012) was the collaborative final project in *ENVS 331 Topics in Geography and Planning*, a course offered for the first time in Spring 2011 in the Department of Environmental Studies and Sciences at Ithaca College. The course focused on landscape change, land conservation, and land management. The lead author, Amber Zadrozny, and most of the collaborators were undergraduate students. Since those early days, Ithaca College students, faculty, and staff have been increasingly involved with the management of Ithaca College Natural Lands (ICNL), in activities ranging from day-to-day operations to long-term resilience planning.

This document primarily guides current land management activities. However, by documenting existing practices, this Management Plan also promotes institutional memory. For example, it codifies the membership, procedures, and responsibilities of the ICNL Committee. This is the group officially charged with making recommendations to the administration on matters relevant to ICNL. As we usher the Management Plan into its 2nd Edition, we see more clearly than ever the importance of steady, reliable governance.

The most significant change in the 2nd Edition is the integration of adaptive management principles and practices. Adaptive management is a systematic approach that relies on collaborative co-management and an iterative, cyclical planning and implementation procedure to promote learning and resilience in conditions of uncertainty. As an inclusive approach, adaptive management encourages all stakeholders to play a role in management decisions. As a flexible approach, adaptive management provides opportunities for social learning and long-term development of shared institutional knowledge.

Ithaca College Natural Lands, like other conservation reserves managed by institutes of higher education, faces challenges in co-management. Its stakeholders are a diffuse group with a diverse range of engagement. Furthermore, its core group of users (students) is by definition transient, spending brief (one- to four-year) periods of relatively intense engagement. Many students almost reside in the Natural Lands, with South Hill Natural Area within view of their residence halls and apartments. These conditions make ICNL a good candidate for adaptive management, because these stakeholder conditions introduce considerable uncertainty and opportunities for rapid change—both for better and for worse.

Our goal in applying adaptive management to ICNL was to build resilience in the face of environmental and institutional changes. Some of these changes we might expect, while others we cannot foresee. If you are reading this, you are probably a stakeholder of some kind or another. Our hope is that this Management Plan resonates with you, and inspires you to get involved in steering ICNL where you want it to go.

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I. Executive Summary

Ithaca College (IC) owns approximately 560 acres of undeveloped property (Appendix A, Maps 1 and 2) that have become increasingly valuable to the diverse members of the College and the surrounding local community. Having been protected in 2004 as Ithaca College Natural Lands (ICNL), this property today faces a pressing need for adaptive management guided by a comprehensive long-term plan. This document outlines current priorities for the use and management of ICNL as educational working landscapes, with attention to IC's broader commitment to inclusive excellence and place-based experiential learning.

The ICNL conservation reserve system was created in 2004 along with the ICNL Committee, whose mission is to maintain the educational value and ecosystem services of ICNL, to support co-curricular activities, and to guide compatible economic and recreational development. The Committee is charged with making informed recommendations on ICNL management to IC's Division of Finance and Administration. This document, written in 2012 (1st edition) and updated in 2020 (2nd edition), outlines the membership and activities of the ICNL Committee, including its relationship with the IC administration.

The management values underlying this document and all recommendations made by the ICNL Committee are the following: Preservation, Education, Research, Recreation, Production, and Adaptability. The sixth core value was added in the 2020 2nd Edition to emphasize ICNL's commitment to adaptive management. The management activities for each of the four ICNL reserves are founded on different combinations of these six management values.

South Hill Natural Area East (SHNA East) is the closest, largest, and most heavily used reserve. The ecological richness and established trail systems in these 365 acres provide a multitude of opportunities for the IC community. Education and recreation are the key guiding values.

South Hill Natural Area West (SHNA West) is also close to campus, but smaller (67 acres), and lesser known relative to SHNA East. A modestly used trail network connects the built campus to Buttermilk Falls State Park. The reserve offers opportunities for teaching land use history and managing successional regrowth. The reserve also holds ecological value as a connector habitat for wildlife movement between South Hill Natural Area East and Buttermilk State Park.

The **Bob Robinson Family Preserve (BRFP)** was donated to IC on the condition that its rare and ecologically valuable habitats be preserved. Management of these 82 acres is motivated also by education and research. A conservation easement protects this property from development in perpetuity.

The **Ithaca College Natural Resource Reserve (NRR)**, also part of the Robinson family gift, is better suited than BRFP to intensive use. As with BRFP, this 46-acre reserve serves educational and research purposes. Ecosystem and habitat preservation can yield to managed regrowth and sustainable economic production activities such as periodic logging.

II. Introduction

II.a. Location

Ithaca College (IC), located in a semi-rural area of Tompkins County within the Finger Lakes Region of central upstate New York (Appendix A, Maps 1 and 2), owns a large area of undeveloped land. This property is predominantly covered by forest at various stages of secondary succession. Throughout IC's recent history, these undeveloped lands have remained modestly used and even unknown to many IC faculty, staff, and students. However, in recent years they have been increasingly valued by the campus community for the ecological services they provide. They are used by a growing number and variety of stakeholders, including students, faculty and staff members, campus organizations, and Ithaca community members. There is a pressing need, therefore, to continually reevaluate these undeveloped properties, and to guide future use with a comprehensive management plan.

A large proportion of IC's undeveloped landholdings are 560 acres formally designated as the Ithaca College Natural Lands (ICNL) conservation reserve system. The ICNL system consists of two parcels adjacent to IC's built campus in the Town of Ithaca and two adjacent parcels approximately 15 km southwest of the Ithaca campus in the Town of Newfield (Appendix A, Map 2).

The ICNL Management Plan outlines current priorities for the use of the ICNL reserves. It also proposes future management activities in accordance with the principles and best practices of adaptive management. Finally, and importantly, it is consistent with, and fully supports, the new Strategic Plan ("Ithaca Forever") and current Campus Master Plan for facilities development.

II.b. Management History

In 2005, faculty from the Department of Biology met with IC administrators about an announcement in the campus newspaper that logging was to occur in the forests of South Hill. This article attracted the attention of numerous faculty, staff, and students. Discussions ensued between these concerned campus community members and the Senior Leadership Team of the College. The principal outcome was the establishment of the Natural Areas Stewardship Committee (NASC). The NASC would be co-chaired by a faculty member (called the Faculty Manager) and the Associate Vice President of Facilities. The NASC was charged with promoting substantive teaching and research (along with other compatible uses) on the College's forested properties on South Hill. The NASC also was to develop management recommendations for the College's other forested properties in Newfield.

Later in 2005, the conservation reserve system known as Ithaca College Natural Lands was founded, and the NASC was reorganized as the Ithaca College Natural Lands Committee (ICNLC). This group, today still co-chaired by a Faculty Manager and the Associate Vice President of Facilities, serves as an advisory body to the Vice President of Finance and Administration on matters pertaining to the use and management of the ICNL reserve system.

In 2012 the first ICNL Management Plan was co-authored by the Faculty Manager and Student Manager (then called the Student Intern) in collaboration with 16

other students and volunteers. This long-term planning project has been the most significant management action to date. The 1st Edition of the Management Plan has guided the ICNL Committee and staff since 2012.

In 2020 the Management Plan was updated in several significant ways. This new document (the 2nd Edition) reflects the growth and evolution of ICNL management during an important time in its history. The period from 2012 to 2020 saw the adoption of a “frontcountry / backcountry” development vision in accordance with similar approaches in other conservation reserve systems nationwide. This vision involved the planned and careful enhancement of services and opportunities for increased use in the frontcountry near the built campus. Activities included the expansion of the trail system, creation of new educational programming, increased signage, and facilitated access through infrastructural improvements at existing trailheads and entry points. Meanwhile, backcountry management involved maintaining a more wild and undeveloped experience in areas farther from the built campus and main entrances. This period also saw a significant increase in visibility, both on campus and in the public. Trail maps and information were entered into official online regional databases, making them accessible to the public for the first time. Educational programming expanded and intensified to increase opportunities for student involvement. Committee membership expanded and diversified to include more interdisciplinary perspectives as well.

The most significant change in this 2nd Edition is the systematic integration of principles and practices of adaptive management. Adaptive management is an approach that views policies as experiments to be studied, so that the results from one generation of management and reflection inform decisions that guide subsequent generations (Holling 1978, Walters 1986). Adaptive management involves a cyclical iteration, so policies can be adapted as circumstances change and managers learn from the results of ongoing activity and experimentation.

Adaptive management starts with the identification of current problems and desired goals. Next comes the design and implementation of appropriate policy, followed by the monitoring of results. With information from this monitoring managers revisit the initial problems and goals, and the cycle starts again (see chart below). Each stage offers potential to involve stakeholders and the opportunity for stakeholders to learn from each other (Walters 1986, Stringer 2006). The purpose for adopting adaptive management in this 2nd Edition of the ICNL Management Plan is to build resilience into the management of the ICNL reserve system in light of rapid change in both the physical and social environment. Uncertain times call for flexible, resilient, and participatory management.

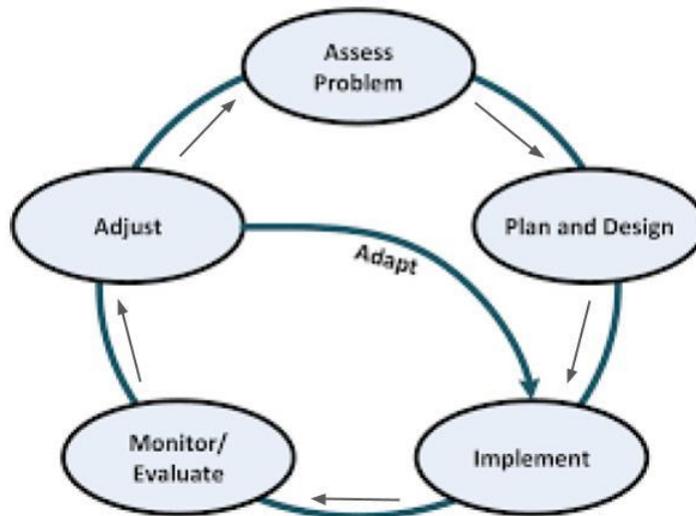


Chart adapted from Salas and Polema (2016).

II.c. Administration and Governance

ICNL Committee Mission

To maintain the educational value and ecosystem services of the College's natural areas, to support co-curricular activities, and to guide compatible economic and recreational development.

ICNL Committee Principles and Bylaws

1. The ICNL Committee is co-chaired by the Faculty Manager and the Associate Vice President of Facilities.
2. Membership on the ICNL Committee is voluntary. There are no term limits. The Committee should strive for representation in its membership of all five Schools (Humanities and Sciences, Health Sciences and Human Performance, Business, Communications, and Music). The Committee should strive for representation of faculty, staff, and students.
3. Decisions of the ICNL Committee are made by majority voting. All voters must be Committee members.
4. Decisions of the ICNL Committee are communicated, as appropriate, to the Division of Finance and Administration (Vice President).
5. Between the ICNL Committee and the administration there is a mutual commitment to respect each other's interests, duties, and operations.
6. Between the ICNL Committee and the administration there is a mutual commitment to transparency, communication, involvement, and good-faith

negotiation.

7. The ICNL Committee is committed to serving the mission of Ithaca College.
8. The ICNL Committee is subject to all existing Ithaca College policies.
9. The ICNL Committee acknowledges its role as an advisory body, and accepts this role as subordinate to that of the administration regarding land use policy.
10. The Faculty Manager, Student Manager, and others involved in day-to-day operations and land management should consult the ICNL Committee and other relevant stakeholders whenever considering projects of potentially significant impact. (See Appendix B)

ICNL Committee Standing Membership and Responsibilities

1. ***Faculty Manager*** (Committee Co-chair): General administration and daily operations; leading Committee meetings; budget management; supervising student workers; developing and executing projects; coordinating with the Ecological Consultant, the Education Director, other committee members, Environmental Health/Safety, Public Safety, and other administrative offices; overseeing interactions with volunteers; interacting with students, faculty, staff, and other campus community members, as well as the public; coordinating with external partner agencies and organizations. The Faculty Manager and Committee Co-chair position must be occupied by a current faculty member of Ithaca College.
2. ***Associate Vice President of Facilities*** (Committee Co-chair): Leading committee meetings; budget management/approval; directing personnel and projects pertaining to the Office of Facilities; coordinating with the Vice President of Finance and Administration, other members of the senior leadership team, and other administrators.
3. ***Ecological Consultant***: Coordinating with external environmental consultants and partner agencies and organizations; coordinating invasive alien species control projects; coordinating research projects; serving as expert adviser to ICNL Committee Co-chairs.
4. ***Education Director***: Designing and coordinating educational programming for students, faculty, staff, the campus community, and the public; offering professional development and training opportunities for ICNL staff and volunteers; developing infrastructure and resources for educational programming (e.g., self-guided nature trail and literature); training and coordinating guides and interpreters; serving as expert adviser to ICNL Committee Co-chairs.
5. ***Recreation Manager***: Designing a recreation management plan; monitoring impact of recreation activities; developing recreational capacity; facilitating community involvement in recreation; emphasizing sustainable recreation practices and balancing recreation and other values.
6. ***Student Manager***: Variable tasks as assigned by the Faculty Manager. Student Managers are responsible for much of the routine operation of ICNL. They work closely with the Faculty Manager and Committee to execute projects. The

Student Manager position must be filled by a student currently enrolled at Ithaca College.

II.d. Management Values

It is important to characterize the conservation value of the Ithaca College's undeveloped landholdings so that the administration can make informed decisions about their use. The ICNL reserves provide important ecological services and unique education, research, economic development, and recreation opportunities. For the purpose of guiding ICNL toward resilience and long-term sustainability, the management values adopted by the ICNL Committee are as follows.

1. **Preservation:** Protection of biological diversity, threatened species, rare habitats and unique or irreplaceable natural areas.
2. **Education:** Curricular enrichment such as *in situ* observation of biophysical phenomena, multi-disciplinary conceptual integration, and practical application of theories and concepts.¹
3. **Research:** A setting for basic and applied projects of any kind in any field. Provision of resources and support for research on, for example, land management and rehabilitation, long-term environmental monitoring, and participatory or collaborative approaches. Opportunity for case study of land use and management in institutes of higher education.
4. **Recreation:** Maintenance and enhancement of public health and wellbeing. Provision of resources and support for inclusive, nature-based fun to benefit the whole community.
5. **Production:** Sustainable provision of economically viable products from intact, functioning ecosystems.
6. **Adaptability:** Management through stakeholder involvement, project modeling, monitoring, and iterative reflection to ensure the use of best management practices in the face of uncertainty.

These six values, to varying degrees and in different combinations, guide the management of each ICNL reserve. They also serve as a guide for all decisions made by the ICNL Committee, and for day-to-day operations on the ground. In accordance with the principles of adaptive management, these values should be periodically re-evaluated for their currency and relevance, and revised as necessary.

III. South Hill Natural Area East

III.a. Location and History

¹ The Ithaca College community frequently uses the ICNL system for educational purposes. For example, students of the sciences use ICNL for on-campus field trips and research-based ("lab") work. Students of the arts use ICNL as a subject and setting for creative works. Students from various disciplines use ICNL to develop teamwork, leadership, and other practical skills for future careers. (See Appendix D)

South Hill Natural Area East (SHNA East) measures 365 acres in area and is adjacent to Ithaca College's built campus to the south (Appendix A, Map 3). The close proximity of this reserve results in more frequent and intensive use than other ICNL reserves.

Before the College's acquisition of what is now SHNA East, the land was used for agriculture and livestock. When Ithaca College moved its campus from downtown Ithaca to South Hill, the property that would become the SHNA East reserve was part of the original land acquisition. Evidence of historical land use is still readily apparent to the trained eye in the form of stone walls and wire fence lines crisscrossing the forests of South Hill.

III.b. Features

Ecological communities of the SHNA East reserve include a mix of successional shrublands, wetland mosaics, and a variety of successional forest types. A 2001 assessment of the ecological communities of SHNA East conducted by Holt Architects P.C. and Ichthyological Associates Inc. recognized SHNA East as ecologically diverse due to a variety of soil types and depths, topography, and past and present human activities (Stafford-Glase et al 2001). The study identified nine different ecological communities, of which three (Perched Swamp White Oak Swamp, Pitch Pine-Oak Forest, and Pitch Pine-Oak-Heath Rocky Summit) are identified as vulnerable at the state level according to the criteria of the New York Natural Heritage Program. The Perched Swamp White Oak Swamp is also designated as a Unique Natural Area by Tompkins County and categorized as vulnerable at the global level (Stafford-Glase et al 2001). This rare community is characterized by depressions in shallow bedrock at the top of South Hill, which retain water during periods of relatively high rainfall and create seasonal swamp conditions. This is in contrast with the well-drained, dry, rocky substrates common throughout the other ridge areas of South Hill.

Based on this same study, 24 vascular plants and lichens were found to be rare (8) or scarce (16) at the local level. At the state level, three species are listed as endangered: *Carex flaccosperma* var. *glaucoidea* (blue wood sedge), *Carex retroflexa* (reflexed sedge), and *Carex willdenowii* (Willdenow's sedge).

While the study did not classify any portion of SHNA East as primary (never logged) forest, there are certain places in SHNA East that contain large trees of >40 cm in trunk diameter, >150 years in age, dense canopy cover, and other elements of relatively old growth. For example, in 2013 a white oak (*Quercus alba*) fell in the Boothroyd Woods, and its trunk was cut to reveal 217 annual growth rings. This tree's germination was thus confirmed to be no later than 1796. In the Cayuga Lake basin, forests with any old growth features are locally scarce (Stafford-Glase et al 2001). The Environmental Management Council of Tompkins County declared most of South Hill Natural Area East as a Unique Natural Area (UNA) for its biological importance.

In the northeastern corner of SHNA East are two wetlands (Raponi and Rich Road) constructed in 2009 as part of the federally mandated wetland mitigation program. The construction of the Athletics and Events Center at the eastern edge of the built campus resulted in the destruction of some small (a few acres) patches of cattail marsh. To offset these impacts Raponi and Rich Road Wetlands were constructed and placed under a conservation easement. Ithaca College granted this easement to the Finger Lakes

Land Trust and the Town of Ithaca for joint oversight and management. The wetlands easement is currently held and annually monitored solely by the Town of Ithaca.

IV. South Hill Natural Area West

IV.a. Location and History

Adjacent to the west side of the built campus across State Route 96B (Appendix A, Map 4), South Hill Natural Area West (SHNA West) was acquired around the time of the first South Hill land acquisition, although the exact date is unknown. This reserve, known colloquially as the “B-Plots” from a past forest survey, was pasture and agricultural fields until the late 1960s or early 1970s, according to historical aerial photos. The SHNA West reserve was expanded to its current 67 acres in 2010 through the purchase of an adjacent parcel on the eastern boundary of the reserve near the South Hill Business Campus.

IV.b. Features

Currently SHNA West has a mixture of land cover types, including large areas of heavily invaded shrublands and shrubby-understory forest, white pine (*Pinus strobus*) stands, and mixed hardwoods. With the exception of historical fencerows and riparian corridors, the forest stands of SHNA West appear to have regrown since the 1970s, relatively recently compared to other portions of South Hill. This reserve contains intermittent streams in small rocky gorges, one of which is lined with unusual (and yet unidentified) species of hybrid ash trees (*Fraxinus sp.*). This reserve acts as a vital wildlife corridor connecting SHNA-East with Buttermilk State Park. Some areas, particularly along the eastern margin of the reserve, are dominated by invasive alien shrubs including multiflora rose (*Rosa multiflora*), exotic buckthorns (*Rhamnus spp.*), and privet (*Ligustrum sp.*). At the center of the reserve is a junction of historical stone walls and fencerows with old, well developed nut and fruit trees, such as hackberry (*Celtis occidentalis*), black walnut (*Juglans nigra*), and black cherry (*Prunus serotina*), as well as other high quality wildlife forage.

V. Bob Robinson Family Preserve

V.a. Location and History

The Bob Robinson Family Preserve (BRFP) is located approximately 15 km southwest of Ithaca College’s main campus on Piper Road in the Town of Newfield (Appendix A, Map 5). The Robinson family donated the preserve’s 82 acres to Ithaca College in the 1970s.

V.b. Features

One of the main attractions of the preserve is the narrow, rocky gorge known regionally as Van Buskirk Gulf. This gorge contains the relatively high-volume perennial stream known as Van Buskirk Creek. A spectacular multi-tiered waterfall ends

in a plunge pool that serves as important habitat for native spawning rainbow trout (*Oncorhynchus mykiss*). This parcel is also home to rare and unique plants such as the walking fern (*Asplenium rhizophyllum*). Access to the stream itself is open as a public waterway for fishing, governed by the New York State Department of Environmental Conservation. Access to the streambanks and uplands of this reserve is by permission, primarily for education and research.

The BRFP contains a variety of forest types (Zubal 2003), including stands of oak (*Quercus spp.*), northern hardwoods, northern softwoods, eastern hemlock (*Tsuga canadensis*), and white pine (*Pinus strobus*). Tulip poplar (*Liriodendron tulipifera*) is also prevalent on the property, growing as tall as 130 feet (Zubal 2003). The Environmental Management Council of Tompkins County declared the BRFP as a Unique Natural Area (UNA) for its biological importance.

In recognition of its ecological importance, BRFP has a conservation easement on it that was granted in 2009 by Ithaca College to the Finger Lakes Land Trust. A volunteer steward lives on site and reports annually to the Land Trust.

VI. Ithaca College Natural Resource Reserve

VI.a. Location and History

The Ithaca College Natural Resource Reserve (NRR) is located west of BRFP across Piper Road in the Town of Newfield (Appendix A, Map 5). Along with BRFP, NRR was donated to the College in the 1970s by the Robinson Family for the protection of its ecological character. These 46 acres of land are managed more intensively than the BRFP, including a selective logging conducted in 2007 to promote forest health and regeneration, and a subsequent timber sale.

VI.b. Features

The habitat is a mix of uplands and lowlands, with abundant wildlife. The lowlands contain large springs as well as small glacial eskers. The most prominent among these springs is a low-nutrient fen wetland on a limestone talus slope. Here resides a population of roundleaf sundew (*Drosera rotundifolia*), a carnivorous plant that the Natural Resources Conservation Service of the United States Department of Agriculture classifies as “exploitably vulnerable” in New York State (Stafford-Glase et al 2001). Other ecological features include an ephemeral stream with a 10-m waterfall, an oak-hickory stand, a maple (*Acer sp.*) - beech (*Fagus grandifolia*) - hemlock (*Tsuga canadensis*) stand, and a few 150-200 year-old trees.

VII. Proposed Activities

VII.a. Changes in Landholdings

While acknowledging its role as an advisory (rather than a regulatory) body, the ICNL Committee calls to the attention to the fact that downsizing, degrading, or delisting (degazettement) of the ICNL reserve system would compromise its unique

conservation values (Mascia and Pailler 2011). Although the ICNL Committee does not promote expansion of the reserve system at this time, it recommends that the College consider any opportunity to purchase neighboring property.

VII.b. Invasive Species: Pests and Disease Management

A standing ICNLC subcommittee should be headed by the Ecological Consultant to direct invasive species management on ICNL reserves. This subcommittee should designate priority areas within the reserve system for action, and should develop a flexible contingency plan for managing biological invasions as they emerge.

VII.c. Educational Use and Outreach

We recommend that all four reserves be further developed for education and research. The SHNA reserves are most accessible, so first steps toward development for education and research should be primarily focused there. However, BRFP and NRR also offer unique opportunities, so certain focused initiatives could better be served by these reserves.

The ongoing campaign to raise awareness and increase accessibility of the ICNL reserve system should continue. The ICNL reserve system is a valuable tool for outreach, including prospective student recruitment, existing student retention, and engagement by faculty, staff, and community members.

VII.d. Research

A primary management value is to continue supporting research and in some instances increase research on reserve lands. The ICNL reserves can serve as the site or setting for research on many different topics. They can also provide the case, question, or object of inquiry itself.

One particular top priority is a comprehensive biological survey on all ICNL reserves. The findings from this survey should be maintained in an open-access central database. Specific attention should be paid to the two UNAs (Van Buskirk Gulf and the NRR's fen), the mitigation wetlands, and other areas of high ecological value.

VII.e. Monitoring and Managing Impacts

As public awareness and recreational access increase, attention should be paid to associated impacts, especially in areas of heavy use. Measurement and monitoring procedures should be developed that are sustainable over the long term with limited financial and labor resources. Data from such a monitoring program could serve as a foundation for policy recommendations, funding requests, and management activities on the ground.

VII.f. Expanding Volunteer Engagement Opportunities

Volunteerism provides an important tool for engaging students in real-world land management, as well as offering a means of public engagement and monitoring. We recommend that volunteer opportunities be developed whenever possible to better engage with the campus and surrounding community. Engaging with volunteers increases

visibility and awareness of ICNL and its conservation values. It also gives stakeholders opportunities to expand and deepen their relationships with the land.

Volunteer engagement with ICNL's largest body of stakeholders, its campus community, should take place through public service opportunities, organizational representation at campus events, and increased access to information and maps. A smaller number of local neighbors, including in the Town of Newfield near the BFRP and NRR, could be involved as volunteer stewards.

VII.g. Neighbor Relations

All boundaries where Ithaca College property meets private or public land should be clearly marked, and neighbors should be notified of this boundary in a friendly way. Signage can be useful to inform the public of activities taking place on ICNL. Any opportunity to engage with neighbors should be considered as an opportunity to engage important stakeholders.

VII.h. Waste Management

There is a significant litter problem in SHNA East, ranging from everyday trash, to office furniture brought into the forest for parties, to clandestine lean-to shelters built from fallen logs. All of this impinges upon the realization of this reserve's conservation values. As such, we recommend a waste management policy and plan for SHNA East (perhaps also for other reserves as visitation increases). This plan should minimize labor and infrastructure requirements, and create a culture of stewardship within the campus community. Elements of a waste management program could include some combination of installed trash receptacles, regular volunteer clean-up days, and/or outreach. An ICNLC subcommittee could facilitate this work.

VII.i. Climate Change

The ICNL Committee recognizes the significance of the current global climate crisis and the high likelihood of impact on the conservation values and management of ICNL. The changes in climate over time will certainly affect the reserve system in many ways, some of which will be unpredictable. As an initial response, we recommend the continued commitment to adaptive management, as this approach has been shown to enhance resilience to climate change (Tompkins & Adger 2004). We also recommend the creation of a sub-committee within the ICNLC to consider emerging threats due to climate change, and determine appropriate responses case by case. As a starting point, the ICNLC should identify priority ecological zones within the reserve system, and develop a plan for increasing protection and building resilience in these zones.

VII.j. Hunting and Fishing

Hunting of any kind is currently prohibited on all Ithaca College properties. Tree stands and other hunting paraphernalia found on ICNL should be documented by a Public Safety officer or Facilities staff member, posted with a removal date, then removed.

In the future, the administration should consider deer population control measures for all ICNL reserve system, but especially in Newfield. Given the generally low visitation at the Newfield reserves and the severe impacts of deer browsing, the

ecological and conservation benefits seem to outweigh the relatively small risks involved. Such a move could increase education and research opportunities focused on effects of deer browsing, increase biodiversity and tree recruitment, provide an opportunity to engage Newfield neighbors as stewards, generate revenue from permits, and improve neighbor relations.

Fishing access is assured on the stream bottom of BRFP by the New York State Department of Environmental Conservation. Uplands on either side of the stream channel remain private property, and are subject to the terms of the conservation easement held by the Finger Lakes Land Trust. The ephemeral streams in SHNA West and the NRR do not support fish.

VII.k. Logging

We recommend that logging remain prohibited on all ICNL reserves except when it is consistent with clearly defined ecological objectives and guided by a forester approved by the ICNL Committee. Forestry objectives will be defined by the Committee, including, for example, forest disease prevention, fire risk mitigation, or habitat enhancement. Areas included in conservation easements will be subject to the terms of those easements.

VII.l. Mineral Extraction:

We recommend that extraction of non-renewable resources (including, but not limited to sand, stone, petroleum products, and other minerals) be prohibited within the ICNL reserve system. Furthermore, we recommend that Ithaca College retain all rights to subsurface minerals on ICNL reserves. The extraction of resources such as oil, shale gas, stone, salt, and so forth would damage the ecological communities within the reserves and compromise their conservation values of the reserves.

VII.m. Iterative Review of this Management Plan

The update to this document in 2020 was the first comprehensive review of the Management Plan since the release of the 1st Edition in 2012. Further updates and reviews should be conducted every 3-4 years or whenever the ICNL Committee deems it necessary. This step is vital to the adaptive capacity of ICNL and its resilience to unpredictable changes in both ecological and social conditions. Recorded land holdings, management values, goals, and recommendations are all subject to change over time and as such should be re-evaluated as conditions change. While a review of the Management Plan does not necessarily require revisions, it is important, at a minimum, to regularly reaffirm the commitment of the ICNL Committee, the ICNL staff, and the IC administration to the management values identified in this document. It is also important to periodically ensure that the information in the Management Plan (including goals, values, etc.) is current and relevant. Iteration and re-evaluation are essential components of adaptive management. Any official change to the Management Plan must be presented to the ICNL Committee for approval.

IX. Conclusion

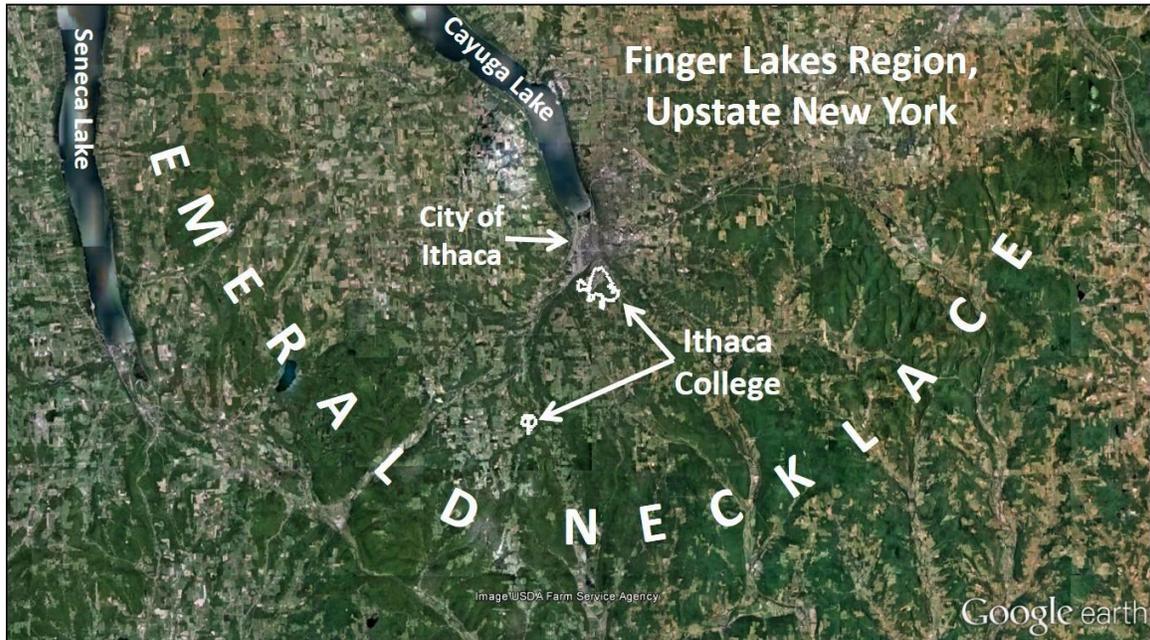
The recommendations in this document are not all equally important; nor are they equally feasible. Some initiatives serve as a framework within which other initiatives can be designed and implemented. Individual initiatives described in this document will be more fruitful if implemented in an integrated way.

The ICNL system is at a critical juncture where its potential as an ecological, educational, and economically productive resource hangs in the balance. Ithaca College can demonstrate excellence in integrative education, student wellness, inclusive environmental stewardship, and collaborative environmental governance by maintaining an active role in the adaptive management of ICNL. Now is a momentous opportunity for Ithaca College to recruit and retain students, fortify its core, and diversify its community of environmental stewards. Strong support of ICNL and its stakeholders could elevate Ithaca College among its peer institutions as a leader in inclusive environmental governance.

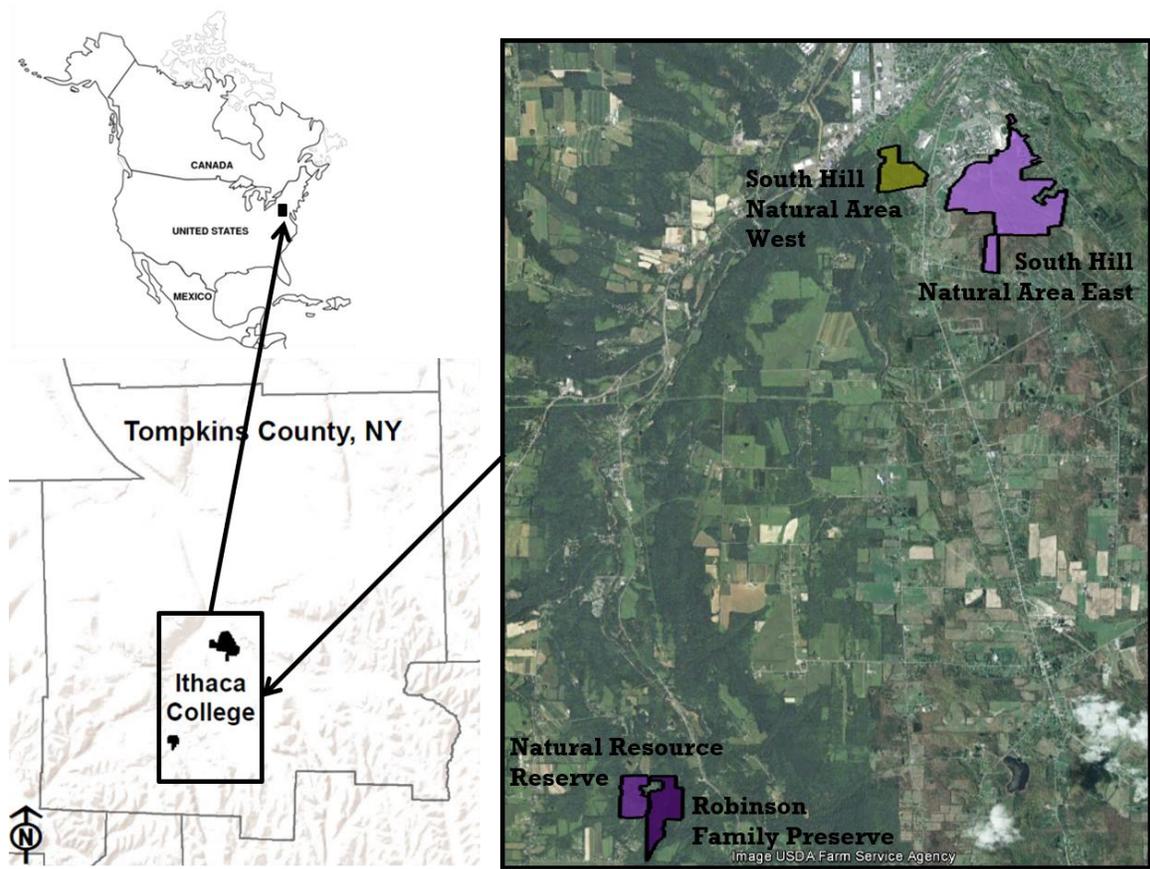
The values of the ICNL Committee and the IC administration will ultimately determine ICNL management in the future. This document can guide the thoughtful maintenance and promotion of those values in a way that assures the preservation and enhancement of this invaluable resource for the benefit of Ithaca College and its surrounding community for a long time to come.

Appendix A: Maps

Map 1. Ithaca College’s landholdings in the Finger Lakes Region of central upstate New York. ICNL reserves are part of the larger “Emerald Necklace” conservation initiative.

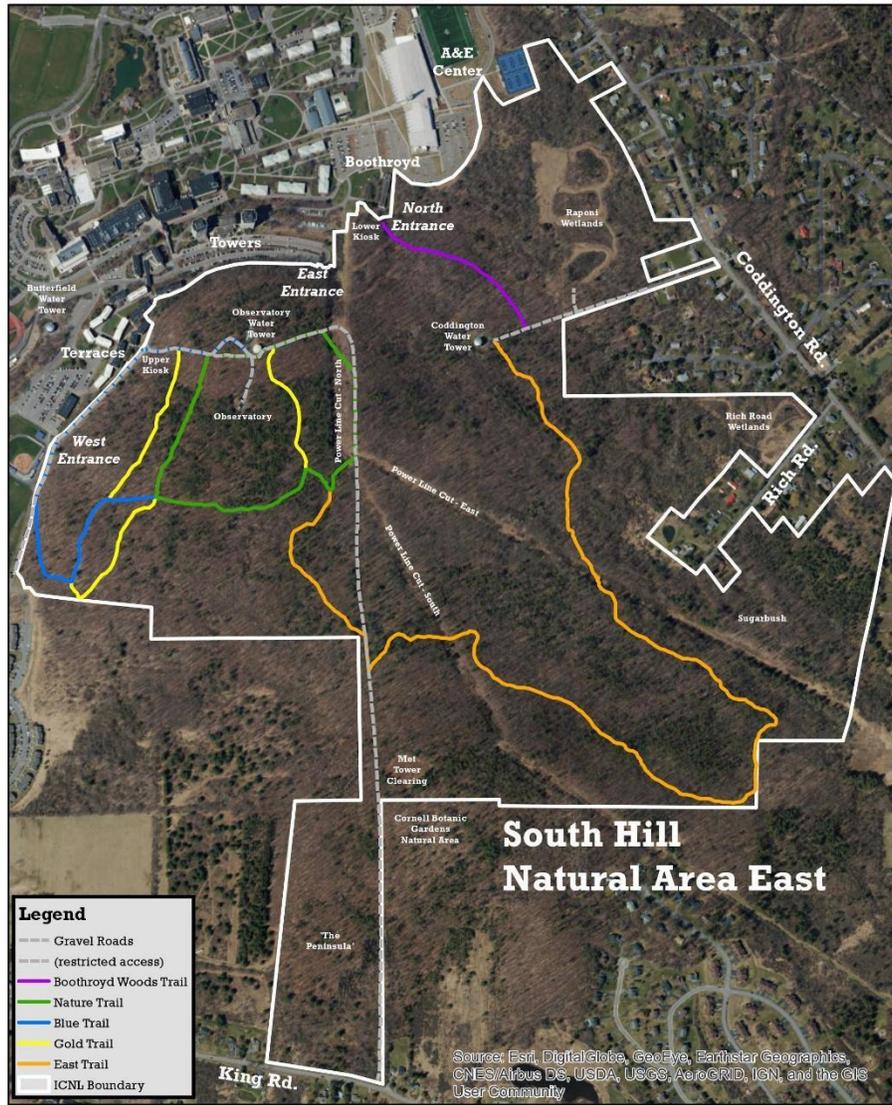


Map 2. The four reserves of Ithaca College Natural Lands within Tompkins County, New York.



Map 3. South Hill Natural Area East.

**Ithaca College Natural Lands
Town of Ithaca, Tompkins County, New York**

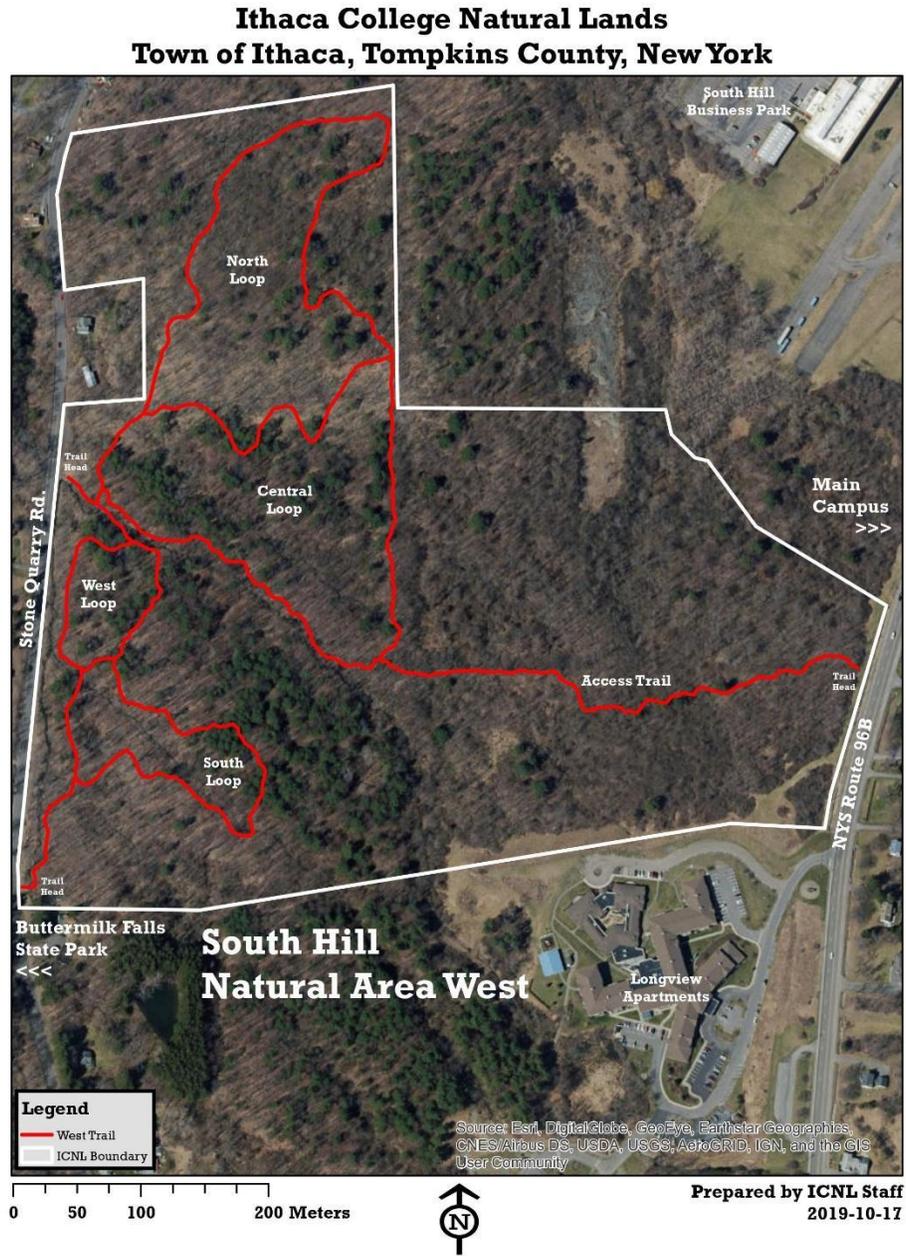


0 125 250 500 Meters



Prepared by ICNL Staff
2019-10-17

Map 4. South Hill Natural Area West.

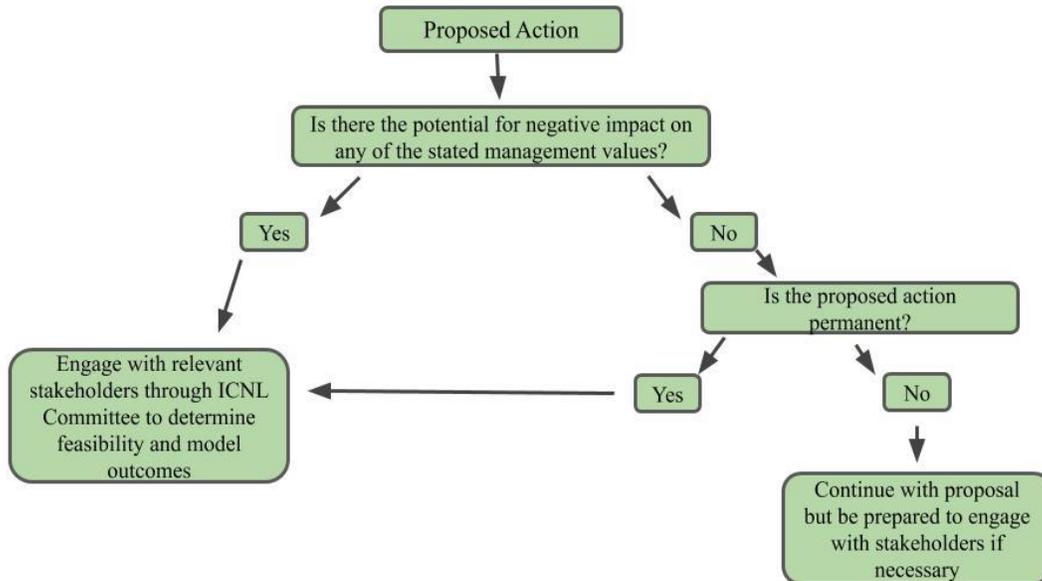


Map 5. The Bob Robinson Family Preserve and the Natural Resource Reserve in Newfield.



Appendix B: Management Decision Flowchart

Managerial Decision Making Flowchart



Examples:

1: A proposal to create a new accessible multi-use trail was presented to managers. While the creation of new trails advances the management value of recreation, proposed locations raised concerns about impacts on preservation of habitat and biological diversity. The proposal was brought to the ICNL Committee for discussion.

2: A proposal for a community service activity was presented to managers. The service event was neither permanent nor had potential to negatively impact any of the management values. Rather, the event would promote values of public awareness and community engagement. The proposal was negotiated by the Faculty Manager and Student Manager without appeal to the ICNL Committee. However, the managers would bring the matter to the ICNL Committee if circumstances changed.

3: A proposal to create picnic tables at the border of ICNL and the built campus was presented to the Faculty Manager and Student Manager. The construction of picnic tables in the frontcountry of the reserve does not have the potential for negative impact on management values but rather facilitates widely held values of public awareness, student engagement, connection with the environment, and community wellbeing. Still, given that the picnic tables would be a permanent installation, and therefore would present long-term impacts (for better or for worse), the proposal was brought before the ICNL Committee for full review and discussion.

Appendix C: Courses that Use the ICNL System

The following list is a compilation of past and present courses that have used the ICNL system for direct course enhancement. This list will be updated as necessary.

- Earth System Science (ENVS 230)
- Environmental Sentinels (ENVS 120)
- Field Biology (BIOL 275)
- Fundamentals of Earth/Climate Science (ENVS 224)
- General Ecology (BIOL 271)
- Invasive Species (ENVS/BIOL 304)
- Independent Research in Biology or Environmental Studies (ENVS 301, BIOL 210/302/400)
- Land-Use & Landscape Change (ENVS 331)
- Natural Resources & Ecology, “Farming The Forest” (ENVS 350)
- Outdoor Adventure Pursuits (RLS 151)
- Principles a Practices of Gardening (ENVS 104)
- Recreational Land Use Ethics (RLS 370)

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