

Long Island Coordinated Invasive Plant Management Plan

**Prepared by the
Steering Committee of the
Long Island Weed Management Area**

2002

FOREWORD

Invasive plants are a leading source of environmental damage across all ecosystems on Long Island. The Long Island Coordinated Invasive Plant Management Plan was prepared by the Steering Committee of the Long Island Weed Management Area as the result of a collaborative process to develop shared strategies for reducing the threat of invasive plants. The mission of the committee is to facilitate cooperation and coordination among land managers and owners, including federal, state, county, and local agencies and non-governmental organizations, for the prevention and management of invasive plants.

Land managers face a serious long-term challenge to develop and conduct effective programs to prevent new plant invasions and manage invaded ecosystems. Through this plan, land managers can coordinate invasive plant management and control efforts, both public and private, and thereby take advantage of opportunities to pool talents and resources, increase awareness and understanding of the invasive plant issue, address the problem of invasive plants spreading from neighboring lands, and develop cost-effective and environmentally sound management programs.

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*This plan was funded in part by a grant from the
National Fish and Wildlife Foundation, Pulling Together Initiative.*

Long Island Coordinated Invasive Plant Management Plan

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I. Introduction and Executive Summary

Plant Invasions

Invasive plants are one of the most serious and pervasive threats to native species and ecosystems on Long Island. Invasive plants, also known as weeds, spread into natural areas and out-compete, damage, and often eliminate native plants and the wildlife that depend on them. In addition to displacing native plants and wildlife, weeds disrupt ecosystem patterns and processes, such as hydrology, nutrient cycling, frequency and intensity of wildfires, natural succession, and soil erosion. Every ecosystem on Long Island is threatened by this biological invasion.

Weeds interfere with outdoor recreation in parks, waterways, and other natural areas by crowding out the diverse blend of plants and wildlife that people come to see and enjoy. On farmland, weeds reduce crop yields and interfere with harvest operations. Along public roads and highways, invasive trees, shrubs, and vines restrict visibility and create dangerous roadside hazards.

By reducing biological diversity, diminishing ecosystem resources, posing public health risks, and burdening agriculture, tourism, fisheries, and outdoor recreation industries, invasive plants are inflicting serious economic damage. In response, land managers spend significant amounts of time and money to control these invaders. However, the most significant and long-lasting damage is too often overlooked or unaccounted for – that of diminished ecosystem services. The services provided by ecosystems, such as clean water, shelter, medicine, and food, ultimately sustain human life.

The threat of invasive plants can be reduced significantly, but will be with us in various forms forever. Some of the negative impacts of invasive plants are likely to be permanent. This is a condition to be managed, not a one-time problem to be overcome and forgotten. Land managers face a serious long-term challenge to develop and conduct effective programs to prevent new invasions and manage invaded ecosystems.

Long Island Weed Management Area

In 2001, a group of Long Island's major conservation land managers formed a steering committee to establish the Long Island Weed Management Area (LIWMA). LIWMA covers all of Long Island, including Kings (Borough of Brooklyn), Queens, Nassau, and Suffolk counties. Founding committee members include representatives from more than 15 federal, state, and county government agencies and private conservation organizations.

Because weeds freely spread across jurisdictional boundaries, the eventual success of any individual agency or landowner's weed control efforts will be largely determined by the cooperative efforts of all conservation agencies and landowners. LIWMA supplements jurisdictional boundaries in favor of natural boundaries that facilitate cooperation, coordination, and implementation of effective weed management programs. LIWMA

enhances and unites individual ownerships and jurisdictions for mapping, planning, monitoring, and conducting weed management and control programs. Everyone gains efficiency and increases their ultimate success by participating in LIWMA.

Mission

The mission of LIWMA is to conserve biodiversity, wildlife habitat, recreation resources, scenic quality, and crop production, while protecting human health and safety, by facilitating cooperation and coordination among land managers and owners to reduce the threat of invasive plants.

Weed management is a vital part of overall site management. LIWMA focuses on conserving biodiversity and ecosystems rather than on merely eliminating weeds.

Vision

LIWMA will serve as the voluntary coordinator and facilitator for cooperative weed management on Long Island. Long Island's rich natural heritage, including parks, nature preserves, wildlife refuges, waterways, and farmland will be protected from new invasions. Invaded areas will be managed for maximum benefit to agricultural, horticultural, and native ecosystems and biodiversity.

Goals

1. To conserve biodiversity, wildlife habitat, recreation resources, scenic quality, and crop production, while protecting human health and safety.
2. To reduce the harmful ecological and economic impacts of invasive plants and enhance the integrity and viability of agricultural, horticultural, and native ecosystems and biodiversity on Long Island.
3. To facilitate cooperation and coordination among key land managers and owners to reduce the threat of invasive plants.

Summary of Strategies

- Prevent new invasions.
- Rapidly detect, assess, and eradicate new invaders.
- Inventory, survey, and map populations of invasive plants and weed-free zones.
- Elevate the profile of the invasive plant issue through education and outreach to establish new funding, policy, and management support.
- Conduct research and share technology.
- Manage invaded agricultural, horticultural, and native ecosystems.
- Restore sites where weed management and control have occurred.
- Monitor changes and evaluate management results.

Purpose of the Plan

The Long Island Coordinated Invasive Plant Management Plan is the long-term guiding document for LIWMA. The strategies and objectives herein address cooperative and coordinated weed management for five years, until December 31, 2007. The plan will be reviewed periodically and revised as needed. The plan will be accompanied by annual action plans that describe in detail the actions, methods, funding, and responsibilities involved. The annual action plans will address how the strategies and objectives of the overall management plan are to be implemented. Participation in any and all LIWMA activities is voluntary.

II. Guiding Principles

Cooperation and Coordination

Cooperation and coordination will result in the most cost-effective weed management for the entire Island over time. The advantages of cooperating in LIWMA include:

- Improved planning that establishes priorities
- Pooled talents and resources
- Focused attention on the weeds issue to establish new funding and policy support
- Ability to address the problem of weeds spreading from neighboring lands
- Improved communication and sharing of technology
- Most cost-effective and environmentally sound management of weeds
- Control efforts based on biology and ecology rather than legal divisions

Consensus

LIWMA is voluntarily governed by a steering committee. The steering committee, in consultation with LIWMA members, plans and implements programs and projects based on the consensus of members, the Long Island Coordinated Invasive Plant Management Plan, and annual LIWMA action plans. Attendance and participation at LIWMA meetings is the primary means of determining consensus.

Integrated Weed Management

The principles of integrated weed management (IWM) will guide the selection of methods used in weed control projects conducted by LIWMA. IWM is a science-based management system that uses all appropriate methods in a compatible manner to reduce weed populations to levels below those causing unacceptable ecological or economic consequences. The use of a combination of methods, including education and biological, physical, cultural, and herbicide controls, is environmentally and economically more

effective than any single method, and minimizes any potential negative impacts to non-target species and human health.

The use of biological agents, herbicide, and other controls are subject to various regulatory and statutory restrictions and agency policies. Their inclusion in this plan is not an endorsement by any individual member of LIWMA. Some members may chose not to use one or more control methods. Biological controls and herbicides are typically used as a last resort, when other controls are likely to fail or would cause greater harm to the environment, and action is imperative.

III. Working List of Invasive Plants

The following is a working list of Long Island’s most serious invasive plants and potentially invasive plants. This list is subject to change and has no legal status. The species are listed in alphabetical order within categories. A quantitative ranking using objective criteria needs to be done.

<i>Prevention / early detection - in NY State, NJ, PA, or New England; Form not yet known on LI</i>			
		Form	Habitat
1	<i>Cardamine impatiens L.</i>	Narrowleaf bittercress	Herb Uplands
2	<i>Dioscorea oppositifolia</i>	Chinese yam	Vine
3	<i>Glossostigma diandrum</i>	Mudmat	Aquatic Lakes
4	<i>Heracleum mantegazzianum</i>	Giant hogweed/cow parsnip	Herb Wetlands, Open Areas
5	<i>Hydrilla verticillata</i>	Hydrilla	Aquatic Lakes, Rivers
6	<i>Lepidium latifolium</i>	Tall pepperweed, perennial pepperweed	Herb Coast, Open Areas
7	<i>Lobelia chinensis</i>	Chinese lobelia	Aquatic Lakes, Rivers
8	<i>Myriophyllum spicatum L.</i>	Eurasian water milfoil	Aquatic Lakes, Rivers
9	<i>Trapa natans</i>	Water chestnut	Aquatic Lakes, Rivers
<i>Early detection / eradication. Limited distribution on LI and high invasive potential. Prevent spread into weed-free zones.</i>			
1	<i>Cynanchum louiseae (Vincetoxicum nigrum)</i>	Black Swallow-wort	Herb Uplands, Open Areas
2	<i>Lythrum salicaria</i>	Purple loosestrife	Herb Wetlands
3	<i>Polygonum perfoliatum</i>	Mile a minute vine	Vine, Uplands
4	<i>Pueria montana var. lobata</i>	Kudzu	Herb Vine Uplands
<i>Watch list - on LI, but invasive potential on LI and/or distribution unclear. Prevent spread into weed-free zones.</i>			
1	<i>Centaurea maculosa</i>	Spotted knapweed	Herb Open Areas

2	<i>Clematis terniflora</i>	Yam-leaf (autumn) clematis	Vine	Uplands
3	<i>Froelichia gracilis</i> (Hook.) Moq.	Cottonweed	Herb	Open Areas
4	<i>Humulus japonicus</i>	Japanese hops	Herb, Vine	Wetlands, Uplands
5	<i>Hydrocharis morsus-ranae</i>	European frog-bit (aquatic)	Aquatic	Lakes
6	<i>Miscanthus sinensis</i>	Eulalia; Chinese silver grass (some varieties)	Grass	Open Areas, Wetlands?
7	<i>Ranunculus ficaria</i>	Lesser celandine	Herb	Uplands, Wetlands
8	<i>Rhamnus frangula</i> ; <i>R. Cathartica</i>	Buckthorn	Shrub	Uplands
9	<i>Rhodotypos scandens</i>	Jetbead	Shrub	Uplands

Widespread, abundant, and a serious threat at one or more natural Form areas. Contain / suppress. Prevent spread into weed-free zones.

			Form	Habitat
1	<i>Acer platanoides</i>	Norway maple	Tree	Uplands
2	<i>Agrostis alba/stolonifera/tenuis</i>	Bentgrass	Grass	Uplands
3	<i>Ailanthus altissima</i> (Mill.) Swingle	Tree-of-heaven	Tree	Uplands
4	<i>Alliaria petiolata</i>	Garlic mustard	Herb	Uplands
5	<i>Ampelopsis brevipedunculata</i>	Porcelain-berry	Vine	Uplands
6	<i>Artemisia vulgaris</i>	Mugwort, common wormwood	Herb	Uplands, Open Areas
7	<i>Berberis thunbergii</i>	Japanese barberry	Shrub	Uplands
8	<i>Cabomba caroliniana</i> A. Gray	Carolina fanwort; Cabomba	Aquatic	Lakes, Rivers
9	<i>Celastrus orbiculatus</i>	Oriental bittersweet	Vine	Uplands
10	<i>Eleagnus umbellata</i>	Autumn Olive	Shrub	Open Areas
11	<i>Euonymus alatus</i>	Winged Euonymus	Shrub	Uplands
12	<i>Euphorbia cyparissias</i>	Cypress spurge	Herb	Open Areas
13	<i>Lespedeza cuneata</i>	Chinese lespedeza	Herb	Uplands, Open Areas
14	<i>Lonicera japonica</i>	Japanese honeysuckle	Vine	Uplands, Wetlands
15	<i>Lonicera bella / morrowii / (tartarica? maackii?)</i>	Shrub honeysuckles	Shrub	Uplands, Wetlands
16	<i>Microstegium vimineum</i>	Japanese stilt grass	Grass	Uplands, Wetlands
17	<i>Phragmites australis</i>	Common reed grass (nonnative genotype)	Grass	Uplands, Wetlands
18	<i>Polygonum cuspidatum</i>	Japanese knotweed	Shrub	Uplands, Wetlands
19	<i>Robinia pseudoacacia</i>	Black locust	Tree	Uplands
20	<i>Rosa multiflora</i>	Multiflora rose	Shrub	Uplands

IV. Weed Management Sites

LIWMA conducts both weed-based and site-based weed management; however, most weed management is conducted through site-based efforts. The goal is to protect the conservation values of particular high-value sites. The factors involved in determining LIWMA management sites include:

- Biological distinctiveness of site
- Natural character of site
- Rare, threatened, or endangered species or communities present
- Good example of community or ecosystem type

Because time and economic resources are limited, it is important that LIWMA confine the management of widespread weeds to the most significant sites and tackle only those weeds that seriously compromise conservation values at sites. Factors involved in determining site-based weed management include:

- Prevent spread into weed-free zones
- Current and potential impacts to conservation targets and goals
- Value of the sites that the weed infests or may infest
- Difficulty of control
- Integrate with other management
- Complements other weed control projects

The following is a working list of recommended weed management sites. Several sites involve multiple ownerships, jurisdictions, and sites nested within them, such as the Atlantic Ocean Beaches and Bays. The list provides a general overview of weed management sites and does not include every site where weed management may occur. Weed management will occur at other sites as needed. The list is in alphabetical order, not in order of importance. This list does not have legal status.

- | | |
|--|--|
| <input type="checkbox"/> Alley Pond Park | <input type="checkbox"/> Edgewood Oak Brush Plains |
| <input type="checkbox"/> Atlantic Ocean Beaches and Bays (AOBB), including: | <input type="checkbox"/> Hempstead Lake State Park |
| <input checked="" type="checkbox"/> Fire Island National Seashore | <input type="checkbox"/> Hempstead Plains |
| <input checked="" type="checkbox"/> Great South Bay | <input type="checkbox"/> Long Island Central Pine Barrens (LIPB), including: |
| <input checked="" type="checkbox"/> Jamaica Bay Wildlife Refuge | <input checked="" type="checkbox"/> Brookhaven National Laboratory |
| <input checked="" type="checkbox"/> Jones Beach, Gilgo, and Robert Moses State Parks | <input checked="" type="checkbox"/> Nature Conservancy lands |
| <input checked="" type="checkbox"/> Smith Point County Park | <input checked="" type="checkbox"/> New York State DEC lands |
| <input checked="" type="checkbox"/> William Floyd Estate | <input checked="" type="checkbox"/> New York State OPRHP lands |
| <input type="checkbox"/> Belmont Lake State Park | <input checked="" type="checkbox"/> Suffolk County lands |
| <input type="checkbox"/> Caumsett State Park | <input checked="" type="checkbox"/> Wertheim National Wildlife Refuge |
| <input type="checkbox"/> Connetquot River State Park | <input type="checkbox"/> Long Island Sound |

- ❑ Long Pond Greenbelt
- ❑ Massapequa Preserve
- ❑ Montauk Peninsula, including:
 - ✓ Hither Hills State Park
 - ✓ Hither Woods Preserve
 - ✓ Lee Koppelman Nature Preserve
 - ✓ Montauk Point State Park
 - ✓ Napeague State Park
 - ✓ Theodore Roosevelt County Park
- ❑ Muttontown Preserve
- ❑ Orient Point, including:
 - ✓ Long Beach Bay State Wetlands
 - ✓ Orient Beach State Park
 - ✓ Orient Point County Park
- ❑ Peconic Estuary, including:
 - ✓ Barcelona Neck
 - ✓ Cedar Point County Park
 - ✓ Conscience Point National Wildlife Refuge
 - ✓ Flanders Bay
- ✓ Gardiners Bay
- ✓ Great and Little Peconic Bays
- ✓ Hubbard County Park
- ✓ Mashomack Preserve
- ✓ Morton National Wildlife Refuge
- ✓ Robins Island
- ❑ Sayville Grassland
- ❑ Shu Swamp
- ❑ Tiffany Creek
- ❑ Valley Stream State Park
- ❑ Welwyn Preserve County Park
- ❑ West Hills County Park
- ❑ Wildwood State Park
- ❑ Wild and Scenic Rivers
 - ✓ Carmans River
 - ✓ Connetquot River
 - ✓ Nissequogue River
 - ✓ Peconic River

V. Strategies and Objectives

Strategy: Prevent new invasions.

The most efficient and cost-effective way to stop the damage caused by invasive plants is to prevent weeds from becoming established in the first place. Prevention is the first line of defense and the highest priority in protecting lands and waters from degradation.

Many potentially invasive plant species are not yet present on Long Island. These weeds must be stopped from accidentally or intentionally being introduced. Weeds that are already here must be prevented from spreading and invading weed-free zones within management sites (refer to part IV).

Prevention needs to occur at multiple spatial scales. This includes preventing invasions that are new to Long Island, new to weed management sites, and new to weed-free zones within management sites.

Prevention includes activities such as education and outreach, prediction of new invasions, exclusion of potential new invaders, inspection and sanitation of vehicles and equipment, and suppression and containment of expansive populations that are likely to spread. Exclusion refers to all activities to stop invasive species from crossing the border of a region or site.

Education is one of the best tools in preventing the spread of invasive plants, detecting new infestations, and in rallying support for controlling infested sites. Greater awareness and understanding from citizens and landowners will lead to increased actions and support in making invasive plants a high priority on Long Island.

When determining weed management goals, it is important to focus on protecting resource values, such as managing for a rare species or suite of species, rather than on merely eliminating weeds.

Objective 1: Work with the Invasive Plant Council of New York State (IPC) and other weed organizations to identify, evaluate, and mitigate the risks of weeds not yet present on Long Island.

Objective 2: Keep updated on invasive plant issues in surrounding states.

Objective 3: Educate the public, land managers and owners, and green industry professionals about the threat of invasive plants, non-invasive alternatives, integrated weed management, and the need to use caution in activities that may intentionally or unintentionally move invasive plants.

Objective 4: Develop integrated weed management plans and programs at each weed management site that emphasize the prevention of new invaders. Ensure that weed seed and other reproductive plant parts are not accidentally or intentionally introduced into a site or weed-free zone.

Objective 5: Provide training on prevention within agencies and organizations lacking such instruction.

Objective 6: Promote voluntary codes of conduct and positive incentives for the agriculture and horticulture industries to prevent the introduction, importation, and release of invasive plants.

Objective 7: Promote compatible outdoor recreation that helps keep lands and waters free from invasive plants.

Strategy: Rapidly detect, assess, and eradicate new invaders.

Early detection, assessment, and rapid eradication manage weeds that have bypassed prevention programs. LIWMA weed management efforts will emphasize regular surveillance, early detection, and prompt action to control new invaders.

Early detection involves activities to identify and report new or recently established populations. Eradication includes all activities to completely eliminate a weed species or particular infestation from an area. Early detection and eradication of small infestations minimizes ecological damage, saves significant time and money, and will be more successful than attempts to eradicate expansive infestations.

Early detection and eradication need to occur at multiple spatial scales. This includes detecting and eradicating invasions that are new to Long Island, new to weed management sites, and new to weed-free zones within management sites.

Objective 8: Emphasize early detection and eradication, in addition to prevention, in weed management plans and programs at each site.

Objective 9: Develop programs at each site for land managers, volunteers (e.g., Weed Watchers), and visitors to identify and report species known to be invasive and occurring on Long Island, as well as those anticipated but not currently known. In addition, look for new species that are not currently known or anticipated.

Objective 10: To improve the chance of finding weeds, develop and maintain up-to-date weed search lists for each site, search where weeds are most likely to appear, and alert visitors to watch out for and report new invaders.

Objective 11: Develop programs at each site, as well as Island-wide, to promptly assess newly discovered populations and activate ***rapid response teams***. Programs will include training on weed identification and control for land managers.

Objective 12: Eradicate new and recently established populations of weeds that threaten conservation targets and goals.

Strategy: Inventory, survey, and map populations of weeds and weed-free zones.

A confident knowledge of the severity and distribution of weeds is necessary for successful weed planning and management. The primary goal of weed inventories and mapping is to accurately identify and delineate lands and waters that contain populations of invasive plants, as well as weed-free zones. These inventories and maps allow land managers to predict areas that are potentially subject to invasion; to understand the ecology of the invasion process; to develop, implement, and evaluate weed management plans; to assess the ecological and economic impacts of invasions; and to increase public understanding and support.

Objective 13: Inventory, survey, and map weeds that seriously interfere with conservation targets and goals at each site. Update periodically.

Objective 14: Map weed-free zones and ecologically sensitive areas (special management zones) within each weed management site to facilitate prevention and early detection programs.

Objective 15: Train and support land managers, volunteers (e.g., Weed Watchers), botanists, user groups, and others to inventory, survey, map, and monitor weeds.

Objective 16: Build capacity to survey and map weeds within agencies and organizations, particularly related to GPS (global positioning systems) and GIS (geographic information systems) training, equipment, funding, and volunteer support.

Objective 17: Work with IPC to develop a standardized weed mapping system and standardized weed monitoring protocols.

Strategy: Elevate the profile of the invasive plant issue through education and outreach to establish new funding, policy, and management support.

Objective 18: Develop a coordinated, ongoing public education and outreach campaign for youth and adults. This includes incorporating weed education into existing state and local educational programs, such as programs for Master Gardeners, pesticide applicators, and teachers at all grade levels. Develop a speakers bureau.

Objective 19: Obtain adequate funding and other resources for weed education, prevention, and management. Increase awareness of existing funding opportunities and secure new sources of funding.

Objective 20: Obtain funding for a full-time LIWMA coordinator or weed specialist position to support education, outreach, and coordination of LIWMA programs and projects.

Objective 21: Build the capacities of LIWMA members and Invasive Plant Council of NYS to reduce the threat of invasive plants, including additional funding and staff dedicated to invasive plant management.

Objective 22: Assist IPC to establish a state task force on invasive species.

Objective 23: Increase membership and participation in LIWMA. Gain commitments from each agency and organization to participate in LIWMA through a memorandum of understanding or letter of support.

Strategy: Conduct research and share technology

Objective 24: Utilize existing research and conduct research to identify, evaluate, and clear new and improved integrated weed management techniques.

Objective 25: Utilize existing research and conduct research to better understand the biology and ecology of invasive plants and the conditions that make ecosystems vulnerable to invasion.

Objective 26: Utilize existing research and conduct research to identify the most effective means of seed harvest and propagation for locally derived native plants to be used in ecological restoration.

Objective 27: Utilize existing research and conduct research to improve methods for restoring and monitoring ecosystem biodiversity and productivity after invasive plant control.

Objective 28: Work with IPC to develop a statewide geographic database on the ecology and control of weeds that is accessible to all LIWMA agencies and organizations.

Objective 29: Identify and/or develop more sophisticated, accurate remote sensing techniques, including unique signatures of weed species, to allow mapping and monitoring of large areas using satellite data or other large-scale methods.

Strategy: Manage invaded agricultural, horticultural, and native ecosystems.

Objective 30: Eradicate new invaders and small populations of weeds that threaten conservation values.

Objective 31: Confine the management of widespread weeds to the most significant sites and tackle only those weeds that seriously compromise conservation values.

Objective 32: Contain expansive populations of weeds that are likely to spread into weed-free zones by preventing the leading edges from advancing and ensuring that weed seed or other reproductive plant parts are not spread.

Objective 33: Suppress expansive populations that are likely to spread into weed-free zones or harm conservation values at their present location by reducing the density of the infestation.

Objective 34: Apply integrated weed management (IWM) systems and techniques to manage and control (eradicate, contain, or suppress) weeds in a planned, coordinated, ecological, and safe manner, including education and the appropriate use of physical, biological, cultural, and herbicide methods. Provide training on IWM and equipment operation within agencies and organizations lacking this instruction.

Strategy: Restore sites where weed management and control have occurred.

Objective 35: Provide training on ecological restoration within agencies and organizations lacking this instruction.

Objective 36: Develop and implement effective restoration methods and procedures for weed-degraded areas.

Objective 37: Ensure that locally derived native plant materials are available for ecological restoration projects.

Strategy: Monitor changes and evaluate management results.

Objective 38: Provide training on ecological monitoring within agencies and organizations lacking this instruction.

Objective 39: Collect baseline field data on existing weed infestations and management practices.

Objective 40: Track weed populations over time. Periodically update weed surveys, maps, and other field data.

Objective 41: Prevent re-invasion by returning to controlled stands to determine if new plants have established.

Objective 42: It is practically impossible to fully monitor all areas and/or species, therefore, prioritize monitoring activities.

Objective 43: Determine if weed management programs accomplish the objectives of the annual action plan, including education and training programs. Make changes to this plan and annual action plans as needed.

Objective 44: Determine if the threat of invasive plants is being abated and if the integrity and viability of conservation targets are being maintained or enhanced.

APPENDIX A: GLOSSARY

BIODIVERSITY (or biological diversity) – The variability among living organisms and their environments, including diversity at the genetic, species, population, and ecosystem levels.

BIOLOGICAL CONTROL (or biocontrol) – Managed living agents, such as herbivorous insects, that decrease the number or density of weeds by reducing the available nutrients, modifying the plant, or feeding on the plant. Biological control agents may be naturally occurring or introduced into an ecosystem.

BIOLOGICAL INTEGRITY – A balanced, integrated, and adaptive community of organisms having species composition, diversity, and functional organization characteristic of the ecosystem's natural state.

CONTAINMENT – Restricting the spread of expansive infestations that are too large or well established to eradicate in a cost-effective manner.

CULTURAL CONTROL – Manipulation of the environment or plant community to reduce weed infestations. This includes managing public use, habitat, and wildlife.

ECOSYSTEM – A unit of biological organization that encompasses a community of organisms and their physical environment.

ERADICATION – Employing appropriate management methods to totally remove a weed species in an area, including reproductive potential.

HERBICIDE CONTROL – A substance or mixture of substances for preventing, destroying, repelling, or mitigating any weed.

INTEGRATED WEED MANAGEMENT (IWM) – A management system that uses all suitable methods in a compatible manner to reduce weed populations to levels below those causing unacceptable economic or ecological consequences. IWM is defined in the Federal Noxious Weed Act as a “system for the planning and implementation of a program, using an interdisciplinary approach, to select a method for containing or controlling an undesirable plant species ... using all available methods, including education; prevention; physical or mechanical methods; biological control agents; herbicide methods; cultural methods; and general land management practices.”

INVASIVE PLANT – A plant species that enters an ecosystem and causes economic or environmental harm. Invasive plants are almost always species that humans have introduced to a region. Sometimes, a native species can be considered an invasive plant at a particular site if it adversely affects an important conservation value at the site, such as when native woody species invade native grasslands.

MONITORING – Repeated systematic observation.

NON-NATIVE PLANTS – Species of plants that humans have introduced to a region. These may also be called “non-indigenous,” “alien,” “exotic,” or “naturalized.” Most non-native plants are not invasive on Long Island.

PHYSICAL / MECHANICAL CONTROL – The use of pulling, digging, mowing, cutting, mulching, crop competition, burning, cultivation, crop rotation and other similar methods to manage weeds.

PREVENTION – Activities such as inspection, sanitation, and education that reduce the possibility of the introduction of weeds into an area.

SPECIAL MANAGEMENT ZONE – An identified area requiring special weed management programs and practices. Special management zones include weed-free zones, ecologically sensitive areas, recreation/special use areas, and transportation corridors within weed management sites. Ecologically sensitive areas include wetlands, aquatic areas, rare species habitat, rare natural communities, and good examples of natural communities and ecosystems.

SUPPRESSION – Reducing the density but not necessarily the total area or boundary of expansive infestations.

WEED MANAGEMENT AREA – An area of common characteristics and specific boundaries that has been designated as a logical area for the management of weeds. A weed management area supplements jurisdictional boundaries in favor of natural boundaries that facilitate cooperation, coordination, and implementation of effective integrated weed management programs. Weed management area may also refer to the association of land managers and owners working cooperatively to reduce the threat of invasive plants.

WEED – A plant species that enters an ecosystem and causes economic or environmental harm. Weeds are almost always plant species that humans have introduced to a region. Sometimes, a native species can be considered a weed at a particular site if it adversely affects an important conservation value at the site, such as when native woody species invade native grasslands.

APPENDIX B: SOURCES OF INFORMATION

WEBSITES

Invasive Plant Council of New York State (IPC)	www.ipcnys.org
USDA	plants.usda.gov
The Nature Conservancy	tncweeds.ucdavis.edu/
Brooklyn Botanic Garden	www.bbg.org/sci/nymf
National Invasive Species Council	invasivespecies.gov
Invasive Plant Atlas of New England (IPANE)	invasives.eeb.uconn.edu/ipane/
National Park Service Wildlife and Plants Web Page	www.nature.nps.gov/wv/
National Coalition Against the Misuse of Pesticides	www.beyondpesticides.org/
<i>Invasive Plants, Changing the Landscape of America: Factbook.</i> https://www.denix.osd.mil/denix/Public/ES-Programs/Conservation/Invasive/intro.html	
Center for Invasive Plant Management (western U.S.) Includes ideas for educational resources for teachers and students.	www.weedcenter.org
BLM Invasive Weeds Toolkit (western U.S.) Includes ideas for educational resources.	www.or.blm.gov/prineville/weed/weed_ed.htm

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Invasive Plants: Weeds of the Global Garden. Marinelli, J. 1996. Brooklyn Botanic Garden Publications, Handbook #149 in the 21st Century Gardening Series. Science Press. ISBN # 0-9-45352/95/6

Halting the Invasion: State Tools for Invasive Species Management. 2002. Environmental Law Institute, Washington, D.C. www.eli.org

Invasive Plants, Changing the Landscape of America: Factbook. Federal Interagency Committee for the Management of Noxious and Exotic Weeds. Washington, D.C. (Also available at the web site listed above.)