



**Botanic Gardens
Conservation International
(U.S.)**

c/o Brooklyn Botanic Garden
1000 Washington Avenue
Brooklyn, NY 11225-1099

Title: Plant for the Planet! Conservation for Home Gardeners

Location and date: First pilot at Brooklyn Botanic Garden, October 9, 2005; second pilot at United States Botanic Garden, August 12, 2006

Audience: This class is designed for adult home gardeners, both with and without prior knowledge of plant conservation issues. The information in the course is not prohibitively technical, and most adults will be able to grasp key points without prior experience. Please note that this is not a gardening skills or techniques course. This point should be clearly communicated in promotional literature.

Goals: Participants will discover simple, everyday actions to promote plant conservation when gardening, from purchasing seed-propagated plants to growing non-invasive species. They will also learn about major threats to plants worldwide, and the government, nonprofit, and citizen efforts to save plants in gardens and in the wild.

Objectives: This course is part of Botanic Gardens Conservation International's "Plant for the Planet!" public awareness campaign. It is also designed as a compliment to BGCI's *A Plant Conservation Checklist for Gardeners*; specific learning objectives are tied to the following points outlined in the *Checklist*:

- ***Know the conservation status of the plant species you choose to grow.***
A comprehensive listing of all plants and their conservation status is outside the scope of this course, but participants will learn where to find conservation information for plants (IUCN Red List, U.S. Endangered Species Program).
- ***Know the laws that protect wild plants and how they affect you.***
We will briefly review international, national, and local policies related to plant conservation.
- ***To help protect wild plant populations, think conservation when buying plants, bulbs, and other plant materials.***
Plants most likely to be wild collected are orchids, cacti and succulents, bulbs, carnivorous plants, cycads, and native wildflowers. Participants will learn to look for plant labels that say "nursery propagated" or "from cultivated stock." Discussion will include strategies for questioning vendors and finding alternative plant sources.
- ***When possible, purchase plants that have been propagated sexually (by seed) to help maintain the genetic health of threatened plants.***
Many plants in the nursery trade are clones propagated in ways that eliminate genetic variation. This is a relatively technical point, but an important one to make. Participants should understand the value of genetic diversity vs. homogeneity.
- ***Be as diligent about documenting the origins of any threatened plants in your garden or greenhouse as you are about growing them.***
Some orchids and cycads, for example, are so critically endangered that plants in private hands may be an important stockpile of germplasm for future conservation efforts. Plants such as the yellow larkspur are being re-established in the wild from genetic stock that has been in private ownership. A plant record form will be provided to all participants.



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- ***Make your garden a refuge for native wildflowers and wildlife.***
Organic growing, integrated pest management, and gardening for wildlife are interconnected themes that will be addressed in discussion. Participants will develop an understanding of ecological connections and their impacts on plants—particularly rare plants. For example, lady’s slipper orchids will only germinate in the presence of specific soil fungi, and diion pollination is deeply intertwined with the life cycle of certain beetles.
- ***Never grow plants that are invasive or potentially invasive.***
Invasive species are the second biggest threat to rare plants. (Habitat loss is the primary threat.) Participants will learn to identify common invasive plants (purple loosestrife, Japanese barberry, Norway maple, or other region-specific species), non-invasive alternatives for the landscape, and where to find lists of other invasive plants.
- ***Make the most of your green thumb—volunteer to assist conservation work at a botanic garden or other group.***
Information about volunteer possibilities at the course site and with other local conservation organizations will be provided.
- ***Support local, national, and international plant conservation efforts.***
Information on local, national, and international plant conservation will be presented during the power point slide show.

Procedure:

Notes to the instructor: This course and PowerPoint presentation have been designed as a compliment to BGCI’s *A Plant Conservation Checklist for Gardeners*. The instructor should be thoroughly familiar with the *Checklist* and other course content areas ahead of time. A script has been included with the PowerPoint presentation, though the instructor is encouraged to modify the script based on personal expertise and regional considerations. A course schedule (included in this lesson plan) can be printed and distributed to participants, written on a chalkboard at the front of the class, or incorporated into the PowerPoint presentation for display. The course will last three hours.

The course instructor should have solid foundations in both conservation and horticulture, though expertise in both of these areas is not required to teach this course. Adult participants at botanic garden courses are likely to have horticultural questions. Many of these questions will likely not relate to the conservation content of this course, but it is important that the instructor address some of them, even if that means answering non-conservation-related questions after the class.

The classroom should be set up in a way that will facilitate the formation of small clusters of four or five participants. Small tables to accommodate groups of this size are ideal. If possible, potted plants with interesting conservation stories (see materials list for examples) should be placed in the classroom to serve as examples later in the course.



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0:00 Welcome and introduction

Instructor introduces her/himself and reviews the course schedule with the class. The schedule (in abbreviated form) is included as Appendix C at the end of the lesson plan. Assuming a class size of fewer than 20, ask each participant to introduce her/himself briefly and state one reason for taking this course. (As an alternative with larger groups, simply ask participants to call out reasons they enrolled in the course. You will not get a response from every participant using this method.) Keep a running list of responses on a large notepad. Spend a moment reflecting on common themes in participant interest and how they correspond with specific focus areas of the course. Let the participants know that all of their questions may not be answered (some questions will likely not relate directly to conservation), but that you will help direct them to answers after the class.

0:15 Participatory introduction to the course content

Participants should already be seated in clusters of four or five. Ask each cluster to spend five minutes developing 1) a definition of conservation or what conservation means to them; and 2) a list of things they can do (or already do) in their own gardens to support *plant* conservation, in particular. Five minutes is a short amount of time for this activity, but it is important to have the course build on the existing knowledge of the participants. Pass out a large piece of paper and a marker for each group to record their responses.

Ask each small group to share its definition of conservation. Post what they have written at the front of the room. Identify common themes in the conservation definitions. Once the participant definitions have been shared and reviewed, introduce the definitions of conservation from the 1980 *World Conservation Strategy* and Merriam-Webster. These definitions are included as the first slides in the PowerPoint presentation in order to provide a visual aid for participants.

- World Conservation Strategy (1980)
the management of human use of the biosphere so that it may yield the greatest sustainable benefit to present generations while maintaining its potential to meet the needs and aspirations of future generations
- Merriam-Webster online (m-w.com)
a careful preservation and protection of something; especially planned management of a natural resource to prevent exploitation, destruction, or neglect

Next, compile the list of plant conservation activities that the group developed. You will need this later for the discussion of *A Plant Conservation Checklist for Gardeners!* Some of these actions will likely be actions included in the *Checklist*.

0:35 PowerPoint presentation: Plant Conservation: Where Are We Now?

This is a short PowerPoint presentation focusing on the state of plant conservation at international, national, and regional levels. Topics included in more detail in the accompanying script include:

- The World Conservation Union (IUCN) and the Red List of Threatened Species
- Convention on Biological Diversity
- Global Strategy for Plant Conservation
- Botanic Gardens Conservation International



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- U.S. Endangered Species Act
- State/regional conservation (will vary by location)
- Host institution's conservation programs

The focus here is on hitting broad points in order to give an overview of plant conservation efforts worldwide and local. This audience probably does not want or need a full overview of the GSPC or other documents, but a general background to help put plant conservation into a larger context is important. The entire PowerPoint slide show, with script, is included as Appendix A.

0:55 Follow up to the PowerPoint presentation: What do international and national issues have to do with my garden?

This is a brief period to field questions raised by the presentation. Where the instructor does not have answers, reference sources should be provided for participants. (The lesson plan bibliography provides reference ideas.)

1:00 Break

1:10 Garden Tour: "Plant Conservation: Up Close and Personal"

The one-hour tour will focus on plants with connections to conservation actions included in the *Checklist*. Participants will learn about plants in the institution's collection with interesting conservation stories to tell. Specifically, the tour will focus on:

1. plants that are rare in the wild, but common in cultivation (*Echinocactus grusonii*, *Metasequoia glyptostroboides*, *Franklinia alatamaha*, etc.)
2. invasive plants (*Berberis thunbergii*, bamboo, Japanese knotweed, etc.)
3. native plants (according to region)

The tour should be constructed to give these points equal coverage. Example plants that could be included (these were part of the pilot course at Brooklyn Botanic Garden):

- *Berberis thunbergii* (invasive): Japanese barberry is an invasive plant that is often used in landscaping. It produces masses of lush red berries that are spread by birds.
- Black bamboo (potentially invasive): Most bamboo species are potentially invasive. These plants spread through underground rhizomes. When growing bamboo, consider using underground barriers made of concrete or plastic.
- *Fothergilla gardenii* (native; potential substitute for barberry)
- *Echinocactus grusonii* (endangered): Fewer than 50 of these plants remain in the wild, though they are now one of the most widely cultivated cacti.
- *Franklinia alatamaha*: Native to Georgia but extinct in the wild, this plant was first collected by John and William Bartram in the late 1700s and named for their friend Benjamin Franklin. All existing *Franklinia* are descendants of this original tree.
- *Ginkgo biloba*: The ginkgo tree is the only surviving member of its botanical division and has been



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Brooklyn, NY 11225-1099

called a “living fossil.” It is believed to be extinct in the wild (in its native China), though it has been grown in cultivation for centuries.

- *Metasequoia glyptostroboides*: Like the ginkgo, *Metasequoia* was first described based on fossil evidence. The dawn-redwood is the only surviving species in the genus and is native to China, where a few wild populations remain. All *Metasequoia* in the U.S. planted before 1991 are descendants of a small group of trees along the Sishuan-Hubei border in Modaoqi. New stock was introduced from China in 1991, following the realization that U.S. plants were suffering from inbreeding depression. *Metasequoia* has been grown in China as an ornamental since before its discovery by westerners.
- *Agave victoriae-reginae*: This slow-growing agave is common in desert collections and nurseries. Unfortunately, it is also endangered in Chihuahua, Mexico (where it is native) largely because of overcollecting.
- *Echinacea tennesseensis* x. *Echinacea purpurea*: The Tennessee coneflower was the first plant to be placed on the U.S. Endangered Species List. It remains endangered in the wild due to habitat loss, competition from exotic invasives, and other pressures of increased suburbanization. The genetic diversity represented by the Tennessee coneflower is being preserved in gardens in both purebred and hybridized forms.
- *Dionaea muscipula*: The venus flytrap is native to bogs and wet hills called *pocosins* (from the Algonquin word for “swamp on a hill”). The survival of its native habitat is tied to the occurrence of small fires that burn away dead plant material. Venus flytraps are subject to overcollecting and habitat loss—particularly due to the ecosystemic effects of fire suppression.

2:10 *Break*

2:20 *YIMBY (Yes! In My Back Yard!): A Plant Conservation Checklist for Home Gardeners*

This section will be a review of the *Checklist*; pass out copies of the *Checklist* now. Some of the *Checklist* items will have been addressed during the tour; these can still be mentioned here, but more attention should be placed on items not yet covered. Each of the *Checklist* items is included as a separate slide at the end of the Powerpoint slide show, in order to provide a visual aid for participants.

Don't just read the pamphlet to the group. This is a long block of time and it is crucial that the group be continuously engaged. Present the *Checklist* as a point-by-point discussion, and engage the group in active questioning. Be sure to draw connections between the *Checklist* and the participants' list of conservation actions (from the beginning of the class), as well as conservation initiatives at various scales (international, national, local). Participants in this course will generally be interested in specific gardening techniques or practices; include any appropriate practices that may relate to the *Checklist* items.

Some specific questions to aid in engaging the group in discussion of the *Checklist*:

- When you buy plants, where does that material originate?
- Many weeds are exotic invasives. What are some common weeds? What traits do they share?
- How can you help to ensure that your plants do not become invaders?
- What do you think are the top two threats to rare plants and why? (habitat destruction and exotic invasives)



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2:50 Wrap-up and final thoughts

Return to the conservation definitions that the participants formulated at the beginning of the course. Ask if they have any changes or additions to the earlier definitions. Close by reminding participants of the crucial role gardeners have in promoting conservation within their own gardening practice, but also within the larger gardening community. Now that they hold the knowledge and understanding from this course, they are challenged to share it with others. Pass out the “Gardener’s Pledge” form (Appendix E), and ask participants to commit to at least one action (in their own words, though it can be an action inspired by the *Checklist*) they will take from now on to promote conservation in their gardening practice.

Ask for any final questions, and then pass out articles for further reading (see materials list for suggestions) and the course evaluation (Appendix D). Thank the participants for their enthusiastic participation and close the course.

Materials:

- A large pad of paper (preferably self-sticking easel pad paper) and markers
- Copies of BGCI’s *A Plant Conservation Checklist for Gardeners* (one for each participant). Copies may be requested from BGCI or downloaded and printed from www.plantfortheplanet.org.
- Laptop, LCD projector, and screen
- PowerPoint presentation: “Plant Conservation: Where Are We Now?” (Appendix A)
- Potted plants for classroom use, if available. Include plants that may not be seen during the tour. (The golden barrel cactus and venus flytrap are common plants available to educators at botanic gardens.)
- Copies of the “Plant Record Form” (one for each participant) (Appendix B)
- Copies of the “Gardener’s Pledge Form” (one for each participant) (Appendix E)
- Copies of the course evaluation form (one for each participant) (Appendix D)
- Copies of articles for further reading (one for each participant). Recommended: “Uprooted: The Worldwide Plant Crisis Is Accelerating”; “The Cult of the Cycads.” (See bibliography.)

Program Evaluation: See Appendix D for an evaluation form.

Time Allotment: Course length is three hours. See procedure for a specific breakdown of times.

Bibliography:

Brickell, Christopher, and H. Marc Cathey, eds. *The American Horticultural Society A-Z Encyclopedia of Garden Plants*. New York: Dorling Kindersley, 2004.

Deneen, Sally, and Tracey C. Rembert. “Uprooted: The Worldwide Plant Crisis Is Accelerating.” *E: The Environmental Magazine*. July/Aug. 1999.

Kessler, Lauren. “The Cult of the Cycads: What Is It About a Strange, Squat Plant That Gives Rise to Smugglers and Obsessive Collectors?” *The New York Times Magazine*. 28 Aug. 2005: 30-35.



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Marinelli, Janet, ed. Plant. New York: Dorling Kindersley, 2005.

_____. Going Native: Biodiversity in Our Own Backyards. Brooklyn, NY: Brooklyn Botanic Garden, 1996.

Randall, John, and Janet Marinelli, eds. Invasive Plants: Weeds of the Global Garden. Brooklyn, NY: Brooklyn Botanic Garden, 1996.

Convention on International Trade in Endangered Species of Wild Fauna and Flora. <http://www.cites.org/>

Convention on Biological Diversity. <http://www.biodiv.org/>

Botanic Gardens Conservation International. <http://www.bgci.org/>

World Conservation Union. <http://www.redlist.org>

Endangered Species Act. <http://www.fws.gov/endangered>

Global Strategy for Plant Conservation. <http://www.biodiv.org/programmes/cross-cutting/plant/default.shtml>

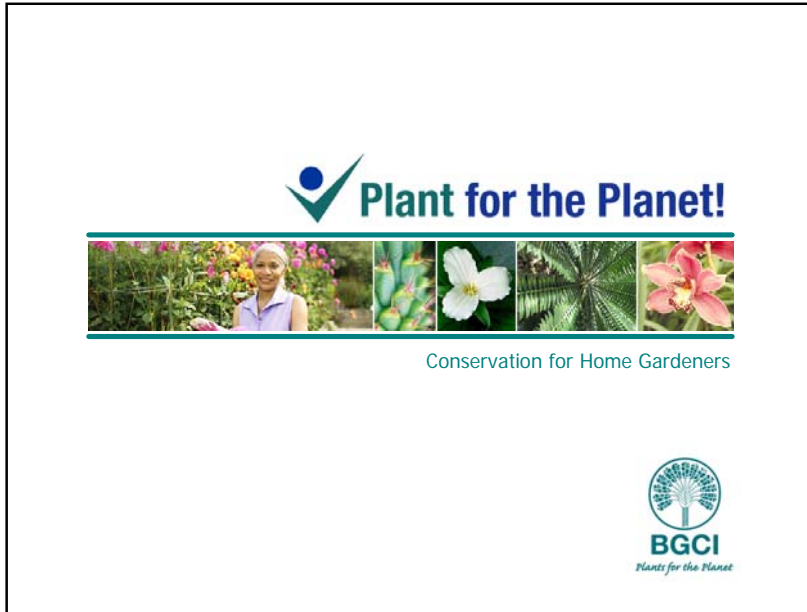
International Agenda for Botanic Gardens in Conservation.
http://www.bgci.org/policies/international_agenda.html



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Appendix A: PowerPoint Slides and Notes



Gardening consistently ranks as one of America's top hobbies, and this love of gardening is a clear indication that gardeners love plants. But most gardeners are surprised to learn that plant populations around the world are facing serious threats to their survival. While the threats to plants are real and immediate, they are not impossible to overcome. Gardeners can play a significant role in helping save plants through simple, everyday actions they can take at home and in their gardens.

This course and presentation were developed by the U.S. office of Botanic Gardens Conservation International (BGCI) as part of its Plant for the Planet! public awareness campaign.



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Conservation definitions

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the management of human use of the biosphere so that it may yield the greatest sustainable benefit to present generations while maintaining its potential to meet the needs and aspirations of future generations

Merriam-Webster online (www.m-w.com)

a careful preservation and protection of something; especially planned management of a natural resource to prevent exploitation, destruction, or neglect



Instructor Note: These definitions are used as visual aids to accompany the “Participatory Introduction to the Course Content.”

Why are plants important?



We sometimes have a hard time grasping just how important plants are to our well being and survival. How silly it would be to sit down and write an article about the importance of the human heart and brain! After all, we all know how vital they are to our lives. But plants are just as vital to our well being and to the health of the planet as a whole. Just think about how our everyday lives depend on plants:

Food: Everything we eat comes directly or indirectly from plants. Throughout human history, approximately 7,000 different plant species have been used as food by people. Of these, only about 200 have been domesticated. Today, however, just 12 plants provide the world with 75% of its calories! These are bananas and plantains, beans, cassava, maize, millet, potatoes, rice, sorghum, soy beans, sugar cane, sweet potatoes, and wheat.

Air: Remember when you first learned about the miracle of photosynthesis? Plants produce oxygen as a byproduct of photosynthesis, and thus provide us with life.

Water: We rely on plants to regulate the water cycle. They help distribute and purify the planet's water. They also help move water from the soil to the atmosphere through a process called transpiration. Approximately, 99% of the water taken up by a plants roots is not used by the plant itself, but instead transpires into the air.

Building Materials: We build our houses out of wood and bamboo and decorate them with plant products like wall paper, paper lampshades, curtains, woven mats and furniture.

Clothing: Most of our clothing is made from cotton. This is produced from the fluffy fibers that protect and help disperse the seeds of the cotton plant. Other plant species produce linen, viscose and hemp.

Climate: Plants help regulate the carbon cycle, which impacts global warming. Through the process of photosynthesis, plants take in carbon dioxide—a greenhouse gas.

Habitat: Of course, aside from humans' myriad uses, plants make up the backbone of all habitats. Other species depend on plants as well for their food and shelter needs.

Pollution: Plants can find foothold on areas of land we have polluted and made toxic, and they can remove toxins from the soil.

Medicine: One-quarter of all prescription drugs come directly from or are derivatives of plants, including the world's most commonly taken drug, aspirin. Many more drugs may be out there but we will never find them if we don't conserve plant diversity. Additionally, four out of five people around the world today rely on plants for medicine.



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The plant extinction crisis!

- Scientists estimate 100,000 plant species are threatened with extinction today.
- Plants are the most endangered species on the planet.
- 29% of U.S. native plant species at risk.
- 50% of our nation's native wetlands have been destroyed.
- Only 5% of our ancient forests remain in tact.
- Extinction of a single plant species can result in the disappearance of up to 30 other species of plants and wildlife.
- Threats to plants include habitat destruction, invasive species, overcollection, climate change, urbanization and pollution.



Despite our reliance on plants for life on Earth, a crisis point has been reached. Botanists today agree that the number of plants threatened worldwide is increasing at an alarming rate. The 1997 World Conservation Union Red List of Threatened Plants contains more than 34,000 species—but this number reflects only those plants for which enough research is available. Scientists today estimate that 100,000 plant species are threatened worldwide—more than one-third of the total global flora—making plants the most endangered species on the planet.

Here in the U.S., the situation is equally dire. Plants are the most prevalent species on the Endangered Species List, and 29 percent of all U.S. native plant species are threatened with extinction. In some cases, the numbers are even more staggering: 50 percent of our nation's native wetlands (which act as pollution filters and flood controllers) have been destroyed, and just five percent of our ancient forests remain in tact.

What's more, the interdependence of ecosystems is highlighted by a U.S. Fish and Wildlife Service study that found that the extinction of a single plant species can result in the disappearance of up to 30 other species of plants and wildlife.

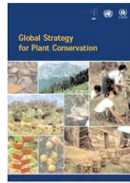
Now, more than ever, plants need our help. An extinction crisis of this magnitude could have devastating consequences, not just on individual plant populations, but on the biosphere as a whole.

Of the threats to plants, three are the most severe. Habitat destruction, invasive species, and overcollection are putting plant populations in peril around the globe.

International progress



Convention on
Biological Diversity



Global Strategy for Plant
Conservation



The World Conservation
Union (IUCN)



So what is being done? The good news is that organizations, governments and individuals are working around the world to secure plant diversity for the well-being of people and the planet.

Perhaps one of the most significant international environmental agreements ever created is the Convention on Biological Diversity. At the 1992 Earth Summit in Rio de Janeiro, world leaders agreed on a comprehensive strategy for "sustainable development" -- meeting our needs while ensuring that we leave a healthy and viable world for future generations. One of the key agreements adopted at Rio was the Convention on Biological Diversity. This pact among the vast majority of the world's governments sets out commitments for maintaining the world's ecological underpinnings while promoting economic development. The Convention establishes three main goals: the conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of the benefits from the use of genetic resources. To date, 188 countries have ratified the Convention; the U.S. is one of just seven nations (the others are Andorra, Brunei, the Holy See, Iraq, Somalia, and Timor-Leste) that have not formally signed onto the goals of the Convention.

The Global Strategy for Plant Conservation was adopted by the Parties to the Convention on Biological Diversity in 2002. It was developed to halt the current and continuing loss of plant diversity and includes 16 outcome-oriented targets to be achieved by 2010. All parties that have adopted the CBD are also legally committed to working toward the GSPC targets by the year 2010.

In addition to policy, organizations are working on an international scale to halt the loss of plant diversity worldwide. [The World Conservation Union \(IUCN\)](http://www.iucn.org) brings together 82 states, 111 government agencies, more than 800 non-governmental agencies (NGOs) and some 10,000 scientists and experts from 181 countries. The IUCN mission is to influence, encourage and assist societies throughout the world to conserve the integrity and diversity of nature and to ensure that any use of natural resources is equitable and ecologically sustainable. Perhaps the IUCN's best-known work is its annual publication of the IUCN Red List of Threatened Species. Each year, the organization evaluates the conservation status of plant and animal species worldwide. As a gardener, you can use this information to know the conservation status of the plant species you choose to grow.



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Botanic Gardens Conservation International

- International community of botanic gardens (more than 200 million visitors annually to botanic gardens worldwide)
- Works locally, nationally, and globally to promote plant conservation
- 537 member gardens in 116 countries
- Maintains world database of plants in botanic gardens
- Goal: to help conserve 50% of the world's threatened plants by 2010
- "Plant for the Planet" campaign



Botanic Gardens Conservation International is the creator of today's course and another organization working internationally for plant conservation. BGCI is the largest professional body that unites botanic gardens around the world. Established in 1987, it links more than 500 botanic gardens in 116 countries. The world headquarters are in England at the Royal Botanic Gardens, Kew. BGCI also has regional offices in 10 countries, with the U.S. office based at Brooklyn Botanic Garden in Brooklyn, NY.

BGCI works on an international scale to safeguard tens of thousands of plant species from extinction. The organization also raises awareness of the importance of plants as one of the Earth's greatest natural resources and the dependence of life on plant diversity. To this end, BGCI maintains a database of plants held in botanic garden collections, so that conservationists and researchers have a formal record of plant materials around the world that can be used for future reintroduction projects. BGCI's goal is to document 50% of the world's threatened plants in garden collections by the year 2010, ensuring the safety of these species from extinction.

This course is also part of BGCI's Plant for the Planet campaign, which aims to promote everyday actions gardeners can take to help save threatened plants. More information is available on the web at www.plantfortheplanet.org.



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National progress: The Endangered Species Act

- Signed into law in 1973.
- Protected species are listed as either “endangered” (in danger of extinction throughout all or a significant portion of its range) or “threatened” (likely to become endangered within the foreseeable future).
- Plants make up more than half of all listed species.
- Prohibits damage to endangered species or critical habitat, with the exception of incidental damage.
- Prohibited to collect, maliciously endanger, or destroy listed species on federal land; the Act also prohibits the interstate commerce of endangered plants.
- Critics: listing process is “too slow” and the law “does not go far enough”; puts too much of a burden on and takes control away from landowners.



Moving from an international scale to the national level, the best-known piece of conservation legislation in the United States is the 1973 Endangered Species Act. Signed into law by President Richard Nixon, the ESA allows for species to be designated as either “endangered,” meaning the species is in danger of extinction throughout all or a significant portion of its range, or “threatened,” meaning the species is likely to become endangered within the foreseeable future. Today, plants make up more than 50% of the nearly 1,300 species listed as “endangered” or “threatened.”

The Act prohibits damage to endangered species or critical habitat, with the exception of incidental damage. It is prohibited to collect, maliciously endanger, or destroy listed species on federal land. The Act also prohibits the interstate commerce of endangered plants.

Critics from all sides have been speaking out in recent years to push for changes in the Act. Some critics point out that the listing process is “too slow,” arguing that it can take years for a species to receive protection and that the survival of some species cannot afford such a long waiting period. Others argue that the Act puts too much of a burden on and takes control away from landowners.

The Law is perhaps one of the most significant pieces of environmental legislation ever passed worldwide. Despite current attacks on its programs, the Act does claim many significant successes, including bringing species such as the Bald Eagle back from the brink of extinction in the wild. Conservation gardeners are encouraged to find out more about the Endangered Species Act.



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Regional progress: Conservation in your home state



Instructor note: Create this slide to highlight regional conservation issues and initiatives.



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**Local progress:
Conservation at your botanic garden**



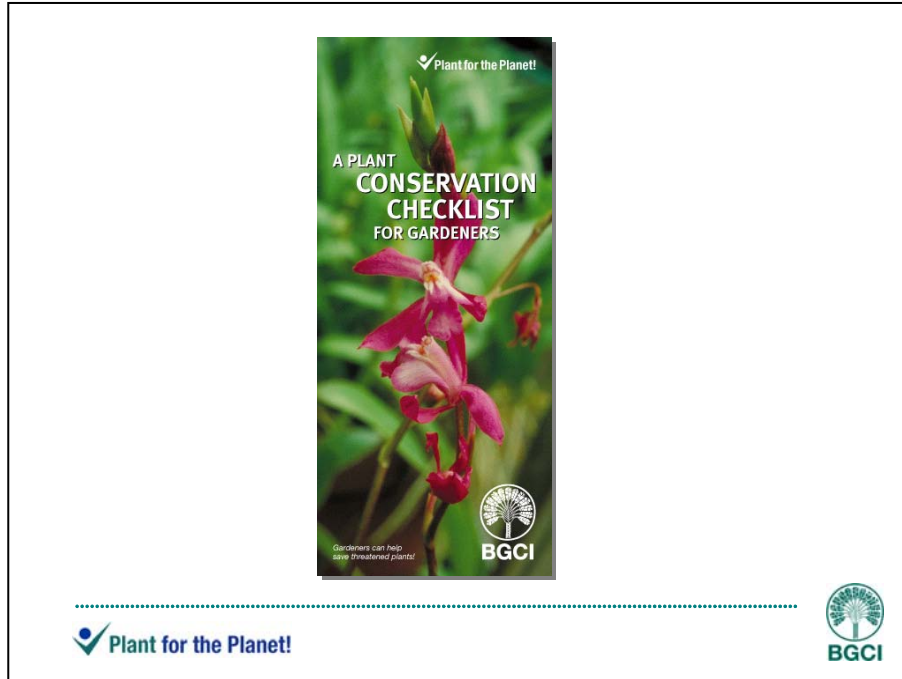
Instructor note: Create this slide to highlight your botanic garden conservation initiatives.

After this slide, it is time for the brief discussion period, *What do international and national issues have to do with my garden?* See lesson plan for more information.



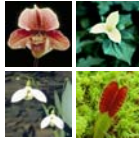
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As you learned on the tour, gardens have often been safe havens for many plants that have been struggling in the wild. Many gardeners would be shocked to realize, however, that some of their gardening practices may be unknowingly contributing to the loss of wild plant populations in their native habitats.

To raise the awareness of plant conservation in the home gardening community, Botanic Gardens Conservation International has launched the Plant for the Planet! campaign and published *A Plant Conservation Checklist for Gardeners*. The pamphlet highlights simple, everyday actions gardeners can take to help save plants. Copies of the *Checklist* are available from me here today. I will also review each of the *Checklist* recommendations.



A Plant Conservation Checklist for Gardeners

Know the conservation status of the plant species you choose to grow.

A large number of the plants you grow in your gardens and that are available in nurseries are threatened in their native wild habitats around the world. By knowing which plants these are, you can be an informed gardening consumer and better able to make decisions that can help save these threatened plants.

Useful resources:

IUCN—The World Conservation Union: www.redlist.org

U.S. Fish and Wildlife Service: <http://endangered.fws.gov>

NatureServe: www.natureserve.org



First, know the conservation status of the plant species you grow. A large number of the plants you grow in your gardens and that are available in nurseries are threatened in their native wild habitats around the world. By knowing which plants these are, you can be an informed gardening consumer and better able to make decisions that can help save these threatened plants.

Every year, [The World Conservation Union \(IUCN\)](http://www.iucn.org) publishes its Red List of Threatened Species, evaluating the conservation status of plant and animal species worldwide. As a gardener, you can use this information to know the conservation status of the plant species you choose to grow.

In the United States, threatened and endangered species are classified according to the U.S. Fish and Wildlife Service's Threatened and Endangered Species Program. Through the program's [website](http://endangered.fws.gov) you can search a database of all protected species.

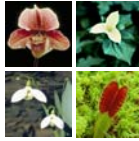
NatureServe also provides a wealth of information on conservation issues and endangered plants, animals and ecosystems. Online, the [NatureServe Explorer](http://www.natureserve.org) compiles global, national and local conservation status information on more than 65,000 plants, animals, and ecosystems in the United States and Canada.

For information about local endangered plants and a wealth of other related conservation topics, you can also access your home state's department of environmental conservation.



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A Plant Conservation Checklist for Gardeners

Know the laws that protect wild plants and how they affect you.

A permit is required to bring home from abroad or obtain from overseas suppliers any plant protected under CITES (Convention on International Trade in Endangered Species). Local and national laws including the U.S. Endangered Species Act and the Lacey Act also regulate the sale of threatened plants.

Useful resources:

Convention on International Trade in Endangered Species: www.cites.org

Endangered Species Act: www.fws.gov/endangered

WWF's Buyer Beware campaign: www.worldwildlife.org/buyer beware



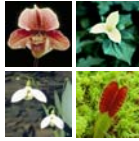
As a gardener, you should also know the laws that protect wild plants and how they affect you. A permit is required to bring home from abroad or obtain from overseas suppliers any plant protected under the Convention on International Trade in Endangered Species. Local and national laws also regulate the sale of threatened plants.

While the laws may be complex, it is important to be familiar with them. It is also important to know your state regulations. In Minnesota, for example, gardeners must take special notice of the laws that protect wild plants. As in many other states, it is illegal in Minnesota to gather, take, buy, or sell plants listed as threatened or endangered in the state of Minnesota. Nurseries are also prohibited from selling endangered or threatened plants to in-state purchasers. But here's where the laws start getting tricky! Some Minnesota nurseries sell to customers in other states, and these nurseries are allowed to sell plants on the Minnesota list to these out-of-state clients. Minnesota gardeners cannot assume that if a nursery sells an endangered or threatened plant that it is ok to purchase it. In fact, a purchase may be in violation of Minnesota law! Consumers are urged to cross-check their potential purchases with the state's endangered species list.



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A Plant Conservation Checklist for Gardeners

To help protect wild plant populations, think conservation when buying plants, bulbs, and other plant materials.

Never buy a plant that has been illegally dug up from the wild. Plants most likely to be wild collected are orchids, cacti and succulents, bulbs, carnivorous plants, cycads, and native wildflowers. Look for plant labels that say "**nursery propagated**" or "**from cultivated stock**." (Beware ambiguous wording such as "**nursery grown**," which may mean that a plant has been stolen from the wild, then grown on in a nursery.) If a plant's origin is unclear, ask the vendor; when in doubt, do not buy. Even better, give your business to sources who actively work to conserve threatened plants.

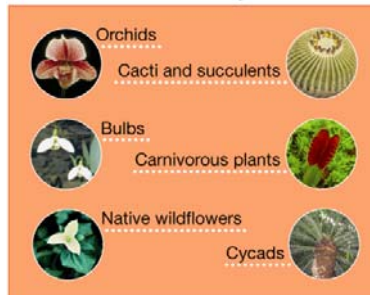


Next, to help protect wild plant populations, think conservation when buying plants, bulbs, and other plant materials. Never buy a plant that has been illegally dug up from the wild. Plants most likely to be wild collected are orchids, cacti and succulents, bulbs, carnivorous plants, cycads, and native wildflowers. Look for plant labels that say "**nursery propagated**" or "**from cultivated stock**." (Beware ambiguous wording such as "**nursery grown**," which may mean that a plant has been stolen from the wild, then grown on in a nursery.) If a plant's origin is unclear, question the vendor; when in doubt, do not buy. Even better, give your business to sources who actively work to conserve threatened plants. The Lady Bird Johnson Wildflower Center website (www.wildflower.org) offers a searchable database of native plant suppliers nationwide. However, avoid purchasing plants or seeds directly over the Internet if you cannot verify the reputation of the vendor.



A Plant Conservation Checklist for Gardeners

The plants most threatened by collection from
the wild for sale in the nursery trade include:



The plants most threatened by collection from the wild for sale in the nursery trade include:

Orchids: Nearly one in ten of every known flowering plant is an orchid. Of the approximately 30,000 species of orchids known throughout the world, at least 700 are on the verge of extinction. Demand for rare orchids drives illegal trade in these imperiled species.

Cacti: Habitat loss and wild collection are the greatest threats to the world's 1,000 species of cactus. Ironically, the wise trend toward xeriscaping in western states has fueled demand for cacti and thus increased the level of illegal wild collection.

Bulbs: Since 1995, the Dutch bulb industry (the world's largest with about 7 billion bulbs exported annually) has required labels that identify either "from wild sources" or "from cultivated stock."

Carnivorous plants: While habitat loss is the largest threat to carnivorous plants, consumers should always check the origins of a carnivorous plant before purchasing. Advances in tissue culture techniques have made large-scale propagation of these popular plants much more viable, relieving pressure on wild populations.

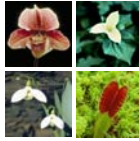
Native wildflowers: Native plants are an excellent choice for gardeners, but be sure you know the source before buying!

Cycads: Cycads remind many people of palm trees, but the two are not closely related. Cycads were literally food for dinosaurs in that they were the dominant vegetation during the Jurassic era. Today, however, 52 percent of cycads are at risk of extinction, and much of the problem is due to the popularity of cycads in cultivation. Cycads are among the most popular plants for landscaping, and wild collection has decimated their populations. It is estimated that one-third of all wild cycads have been dug up by collectors.



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When possible, purchase plants that have been propagated sexually (by seed) to help maintain the genetic health of threatened plants.

Many plants in the nursery trade are clones propagated in ways that eliminate genetic variation. The genetic diversity of threatened plants is best served when they are grown from seed. Before buying them, ask how the plants have been propagated.



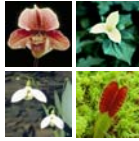
Next on the Checklist...

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A Plant Conservation Checklist for Gardeners

Be as diligent about documenting the origins of any threatened plants in your garden or greenhouse as you are about growing them.

There are some plants that are so critically endangered in the wild that specimens in private gardens could be an important source of germplasm for future conservation efforts. A detailed record of their provenance, or origin, increases the conservation value of the threatened plants you grow. Conservation-minded suppliers of seed or plants can provide such information.



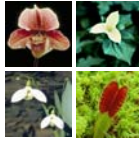
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BGCI has created a plant record sheet that you can photocopy and then start a file for your plant records. I have copies of this form here with me today.



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A Plant Conservation Checklist for Gardeners

Make your garden a refuge for native wildflowers and wildlife.

By using native species in plantings modeled after local plant communities such as forests or prairies, you can do your part to help compensate for the loss and fragmentation of habitat, and nurture birds, butterflies, and other pollinators and seed dispersers. And don't forget — to avoid threatening plants indirectly by damaging their pollinators and native habitats, don't use toxic pesticides, don't overfertilize, and choose plants to minimize water use.

Useful resources:

National Audubon's "Audubon at Home": www.audubon.org/bird/at_home
"Going Native: Biodiversity in Our Own Backyards," BBG Handbook



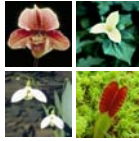
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Many organizations already have extensive wildlife gardening campaigns. The National Audubon Society's "Audubon at Home" campaign provides tips for creating a healthy, wildlife friendly yard. Additionally, the National Wildlife Federation will certify your yard as "Backyard Wildlife Habitat." NWF's new TV show on the Animal Planet cable channel, "Backyard Habitat" also offers information and ideas for the home gardener.



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A Plant Conservation Checklist for Gardeners

**Never grow plants that are invasive or potentially
invasive.**

Many common garden plants can become invasive. Invasive plants spread out of control in the wild, threatening native plants and animals. Remove these plants from your garden. The best way to avoid introducing a new invasive plant is to select trees, shrubs, and wildflowers native to your area.

Useful resources:

"*Invasive Plants: Weeds of the Global Garden*," published by Brooklyn Botanic Garden, www.bbq.org.



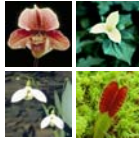
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You can learn which plants are invasive in your area through the National Wildlife Federation's www.enature.com website.



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A Plant Conservation Checklist for Gardeners

Make the most of your green thumb — volunteer to assist conservation work at a botanic garden or other group.

From propagating threatened species to removing invasive plants, the amount of work required to save the estimated 100,000 imperiled plants worldwide is staggering. Botanic gardens and other groups rely on volunteers to help get the work done. Visit www.bgci.org to find botanic gardens near you.

 **Plant for the Planet!**



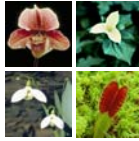
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(Include information about volunteering at your institution here.)



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A Plant Conservation Checklist for Gardeners

**Support local, national, and international plant
conservation efforts.**

Become a member of botanic gardens and other groups
involved in plant conservation and habitat preservation. Let
your government officials know plant conservation is
important to you.



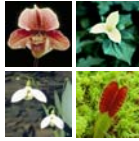
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(Include information about membership at your organization here.)



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A Plant Conservation Checklist for Gardeners

**Be an ecotourist — support sustainable use of plants
when you travel.**

Ecotourism is travel that contributes to the protection of critical habitat and sustains local communities. Choices range from small-scale tours to large resorts.

Earthwatch Institute – conservation expeditions!

<http://www.earthwatch.org>

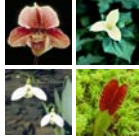


Finally, be an ecotourist—support sustainable use of plants when you travel. Ecotourism is travel that contributes to the protection of critical habitat and sustains local communities. Choices range from small-scale tours to large resorts. While there is no current program for certification of ecotourism operations, you should choose operators that actively work with local communities and that integrate principles of sustainability into their business.



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**A Plant Conservation Checklist
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<http://www.PlantforthePlanet.org>

<http://www.bgci.org>



For more information on these topics, visit the websites mentioned throughout this presentation, or visit the Plant for the Planet website at www.plantfortheplanet.org.



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Appendix B: Plant Record Form

This form provides a way to track plants in your collection that may be rare, endangered, or an important source of genetic diversity—though it is good practice to keep thorough records on all the plants in your collection.

Owner Name			
Address			
City			
State		Zip Code	

Plant Information

Genus	
Species	
Subspecies	
Variety	
Cultivar	
Location in my garden	

Source information (Complete all that apply; be as specific as possible.)

Date obtained	
Number of plants obtained	
How and/or where obtained (purchase, gift, collection, name of supplier, etc.)	
Supplier address	
Nursery-grown? Name nursery.	
From seed? Identify source.	
Collected? List site.	



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Appendix C: Course Outline

Plant for the Planet: Conservation for Home Gardeners

0:00	Welcome and introduction
0:15	Participatory introduction to the course matter
0:35	PowerPoint presentation: "Plant Conservation: Where Are We Now?"
0:55	Question/answer time: What do international and national issues have to do with my garden?
1:00	Break
1:10	Tour: "Plant Conservation: Up Close and Personal"
2:10	Break
2:20	YIMBY (Yes! In My Back Yard!): The plant conservation checklist for home gardeners.
2:50	Wrap-up and final thoughts



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Appendix D: Program Evaluation Form

Your feedback is an important part of strengthening our programs and educator skills. Please take a few moments to tell us about your experience during this course. Thank you.

	Poor	Fair	Good	Very Good	Excellent
The instructor's knowledge of the subject area was:					
The instructor's teaching ability was:					
The course content met my expectations.					
The course content will be useful to my garden practice.					

What was the most engaging or interesting part of this course? Why?

If you could make changes to this course, what would you suggest?

What other topics related to conservation would you be interested in learning about?



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Appendix E: Gardener's Pledge Form

I, _____, pledge to promote a conservation ethic through my gardening practices. Specifically, I will:

Signed,

_____ (signature)

_____ (print name)

_____ (date)