



Nurturing Natives

Native plant restoration began in Glacier National Park during the late 1970's with revegetation projects at Logan Pass and backcountry campgrounds, as well as exotic plant control park-wide. The program dramatically expanded in 1986 when the park entered into partnership with the Federal Lands Highway Administration (FLHP) to repair the aging Going-to-the-Sun Road.

Road rehabilitation, as well as construction and heavy visitor use (in campgrounds, scenic vistas and developed areas, for instance), results in disturbance to the vegetation and soil. The consequences include bare ground, soil erosion, invasion by exotic plants, displacement of animals and reduced aesthetic value and biological integrity.

To address these issues, Glacier National Park has developed a comprehensive restoration program in order to repair the structure, function and plant diversity of these impacted areas. Native soils and plants are salvaged prior to an anticipated disturbance and returned to the site following the completion of construction. Seeds and cuttings are collected near the restoration site and propagated in the nursery. Weed management occurs simultaneously. Following site stabilization and restoration, vegetation monitoring is implemented to evaluate the effectiveness of revegetation efforts and to provide guidance as to appropriate rehabilitation strategies for future projects. As part of the restoration program, staff members conduct site evaluations and develop vegetation inventories that describe the existing site conditions as well as suggest appropriate revegetation species for planting. Next, a restoration plan is developed that provides detailed information on how site rehabilitation will be implemented and addresses the following program objectives:

- Preserve the genetic integrity of the park's native floral populations and provide for optimum survival and vigor of plant materials by using species collected at or near the disturbed site
- Stabilize soil and establish adequate vegetation cover to prevent continued erosion
- Inhibit the invasion and establishment of exotic plant species and provide for native plant reintroduction following weed eradication
- Restore species composition and structure to the disturbed site with vegetation that is ecologically and visually compatible with the adjacent undisturbed plant communities
- Utilize plant species that are trample-resistant, sustainable and low-maintenance
- Initiate opportunities for research and technology transfer, and continually improve restoration and propagation techniques.



Glacier's restoration program combines the expertise of many individuals including the Park Ecologist, Restoration Biologist, Integrated Weed Management Biologist, Nursery staff, Revegetation crew, Plant Monitoring crew, and the Integrated Weed Management crew.



Native Plant Nursery



Glacier's nursery was built in 1987 in order to supply native plant material for revegetation efforts used in response to the Going-to-the-Sun Road rehabilitation project and other human-caused disturbance to natural landscapes. Since then, the nursery has more than doubled in size and production capabilities.

Over 235 native plant species, representing all major habitats found throughout the Park, have been propagated. These species include grasses, sedges, forbs, ferns, shrubs and trees (both deciduous and evergreen). The nursery grows up to 15,000 new plants each season and, at the height of the summer, may contain as many as 20,000-30,000 plants.

Plants in the Nursery are grown either from seed or from vegetative propagation using parts of live plants. Seed propagation requires simulating the natural environment in order to trigger germination. Scarification (the process of opening the seed coat) is required for some seeds that have thick seed coats, so that they can take in water. Stratification involves putting the seeds through a series of warm and cold periods to simulate the fall and winter seasons. Vegetative propagation includes taking cuttings from rhizomes, roots and stems, or dividing and replanting plants. This can often result in plants being ready for out-planting quicker than seed-grown plants. The plant materials used for propagation are collected within the park at specific project locations. Each species of plant has a unique set of growing conditions and processes that must be met in order to obtain successful propagation.

The nursery is a seasonal operation, which is opened in April and "put to bed" in late October. Winterizing requires that

plants be laid down like dominoes and covered with plastic sheeting. Depending on the species, a layer of foam may be used for added protection, as well. A thick coating of snow is also required to maintain effective insulation and prevent repeated freezing and thawing of the plants that would result in plant mortality.

Get Involved

Public Tours

Check the Glacier Explorer publication or call (406) 888-7835 for a schedule of summer tours through the Nursery. Tours begin on the front steps of Headquarters at 10:00 am every Tuesday from mid-June through Labor Day.

Stewardship & Environmental Education

A STARS (Students Taking Action in Restoration and Stewardship) curriculum-based program is offered to grades K-12. In this program, students get a hands-on education that focuses on native plants and restoration concepts, while promoting increased knowledge and stewardship of Glacier National Park.

Volunteer Days

The Native Plant Nursery depends on the help of volunteers to accomplish all of its goals throughout each season. So, come learn about native plants and give back to the Park at the same time! The nursery is located behind Park HQ and is open one day a week for anyone who wants to get their hands dirty. Occasionally, other volunteer opportunities are available throughout the Park with various Resource Management crews.

For More Information

Supervisory Horticulturist:
(406) 888-7817

Nursery Manager/Stewardship Coordinator:
(406) 888-7835

Website Links
Glacier National Park Home Page:
www.nps.gov/glac

Plant Propagation Protocols:
<http://nativeplantnetwork.org>

Vegetation Map of Glacier National Park:
<http://biology.usgs.gov/npsveg/glac/index.html>

Montana Noxious Weeds List:
<http://agr.mt.gov/weedpest/noxiousweedslist.asp>



Revegetation

The revegetation crew is responsible for planting all of the material grown in the Native Plant Nursery, as well as assisting with seed collection and many of the nursery maintenance tasks. Their work also includes site evaluations, plant and soil salvage and storage, and site stabilization prior to planting, as well as plant and seed materials installation, mulching and site protection. Methods include decompacting and improving the soil, installing native plant and seed materials, obliterating unnecessary social trails or other extraneous pedestrian travel paths, preventing continued impacts to sites by blocking with large organic debris such as dead/downed trees and the installation of signs to inform visitors of the significance of such projects.

Crews assist with plant materials collection and production, site assessment, and implementation of restoration techniques to an average of 45 projects a year, ranging in size from small backcountry campground improvement to large construction projects where many acres of parklands have been disturbed, such as facility improvements and FLHP road reconstruction projects.



Vegetation Monitoring

An important part of Glacier's vegetation management program is inventory and monitoring. Projects that focus on describing what is out there and its current baseline status are considered inventory projects, while those that revisit sites and follow changes over time are monitoring projects. The monitors are working to map selected rare plant populations and characterize the sensitive wetland communities in which many occur, emphasizing those that could potentially be threatened by development or recreation.

The bulk of monitoring carried out in the park is linked to the park's restoration program. Every restoration project begins with a site analysis or a description of the species and characteristics of the site prior to disturbance. The site analysis is used in preparing the planting prescription. Each site is monitored afterwards (generally 1, 2, 3, 5, and 10 years following planting).

The monitoring results are compared with objectives which lead to our long-term goal of restoring a vegetation community that will blend into the adjacent community, resembling the native species composition and diversity. We aim to achieve a resilient plant community that will eventually out-compete weeds and be resistant to future invasions. Based on monitoring results, we determine which species are most successful and which have done poorly, as well as what the cause might be. Future planting prescriptions and strategies are adjusted accordingly to achieve the highest degree of success and cost-effectiveness.



Invasive Weeds

Weeds are the outlaws of the plant world. They may be pretty, but they are out of place and take away valuable resources from native populations. From a distance, weeds do not seem so bad. But take a closer look and you will see the weeds choking out the native wildflowers, grasses, and shrubs. These native plants protect the soil, attract and sustain a variety of wildlife, and add to the park's biodiversity.

Many invasive plants come from other parts of the world. They arrived in America without the natural controls such as insects, diseases, and competing plants that kept their populations in-check in their native countries. Once established, weeds are tough to get rid of because they produce hundreds (if not thousands) of seeds and/or they have extensive root systems. Unfortunately,

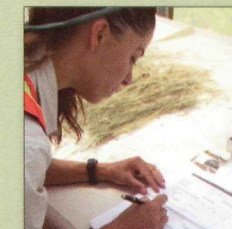
a number of these invasive weed species are increasing in quantity, area of infestation, and density.

The flora of Glacier includes 1050 native plant species, with an additional 126 non-native plants. Many of these non-natives are ornamental species, although 16 are considered invasive. Some of the most troublesome non-native invasive weeds include: Spotted Knapweed, Leafy Spurge, Oxeye Daisy, St. Johnswort, and Orange Hawkweed. The most aggressive weeds spread into grasslands and forests, reducing wildlife habitat, increasing soil erosion, and diminishing the diversity of park flora.

Preserving the natural ecosystem is the goal of Glacier National Park. That means keeping the native plants strong and healthy,

preventing the weeds from getting in and taking action against the weeds that have already crossed into the Park. Integrated Weed Management is the approach used to control invasive weeds in Glacier. This approach targets a weed, and then selects the methods of treatment best suited for the location.

Control of weeds within the park is undertaken cautiously to prevent damage to native plants, animals, and aquatic resources. Actions are based on research and consultation with field experts and may include hand-pulling or digging, cutting or mowing, introducing specific insect and fungi populations, applying herbicides or even attempting to out-compete the invasives with hearty native plants.



Partnerships

The Natural Resources Conservation Service, Bridger Plant Materials Center in Bridger, Montana, provides assistance with technical advice, seed storage, seed cleaning, seed increaser crops, and propagation research.

The U.S. Forest Service has grown Whitebark Pine seedlings from Glacier at their Coeur d'Alene Tree Nursery. The Flathead National Forest receives planning and plant production assistance from park staff.

Montana Conservation Corps crews work with the plant restoration program on projects including revegetation, nursery maintenance and seed collecting.

The Cooperative Greenhouses at the Blackfeet Community College, Columbia Falls High School and Kalispell Jr. High, provide opportunities for students to grow plants from seeds collected in Glacier as part of the Park's environmental education program. Students from Local School Districts, at all grade levels, also participate in the Park's environmental education program by assisting in revegetation of campgrounds and other disturbed sites, nursery maintenance, plant care, seed collecting

and monitoring. We also have a Rocky Mountain Cooperative Ecosystem Studies Unit grant to support a summer intern in restoration ecology from the Salish Kootenai College in Pablo, MT.

Federal Land Highway Administration Program (FLHP) provided initial funding for the construction of the nursery and the development of the Native Plant Restoration Program in Glacier. Each year, FLHP funds provide seasonal salaries for staff to engage in plant materials collection and production and to implement restoration work on completed construction projects on the Going-to-the-Sun Road.

Weeds cross borders as easily as the wind, so it is important to take on these problems regionally. Glacier is working closely with its neighbors to keep these "undesirables" in-check. The park is coordinating its invasive weed control efforts with neighboring counties, the US Forest Service, the Blackfeet Indian Reservation, the adjacent Canadian provinces, as well as Waterton Lakes National Park.

You Can Help



Each and every visitor can play a part in our restoration efforts by reducing the amount of impact they have on the vegetation while visiting the park. You may see signs, such as this one, located at various locations throughout Glacier identifying areas of restoration. Perhaps you're already familiar with the Leave No Trace philosophy which asks that you "Take only pictures, Leave only footprints". So, please remain on the trails and only use designated campsites. Enjoy the flowers, but leave them so their seeds can spread.



Also, you may see some of our crews working on roadsides or near trailheads, wearing orange vests or protective gear. Feel free to inquire about current restoration efforts or the work that these folks are doing. We all love to talk about our work and about this amazing Glacier National Park.

