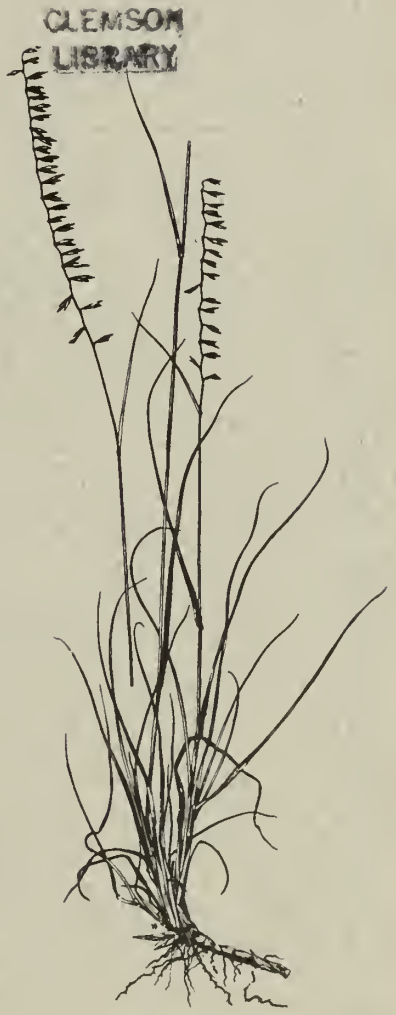

Revegetation Field Tour Glacier National Park August 9-15, 1992

Daily Agenda

August 9, 1992
Travel to Kalispell, Montana

August 10, 1992
Focus: Propagation of Native Plants for Revegetation

August 11, 1992
Focus: Integrated Vegetation Program

August 12, 1992
Focus: Reclamation Strategies and Evaluations

August 13, 1992
Focus: Backcountry Reclamation

August 14, 1992
Focus: Issues and Concerns for Management

August 15, 1992
Return Home via Kalispell

Revegetation Field Tour Glacier National Park August 9-15, 1992

A cooperative effort between Glacier National Park and the Denver Service Center, United States Department of the Interior, and the Soil Conservation Service, United States Department of Agriculture

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August

10,

1992

August 10, 1992

Focus: Propagation of Native Plants for Revegetation

6:45-8:00 a.m.	Checkout, load vans, and travel to West Glacier
8:00 a.m.	Arrive at community building/headquarters
8:15-9:15 a.m.	Welcome, housekeeping, field tour objectives, vegetation program at Glacier National Park
9:15-11:00 a.m.	Plant materials program: native plant nursery, SCS plant materials program, private growers
11:00-12:00 noon	Lunch at the nursery
12:00-1:00 p.m.	Travel to Polebridge in the North Fork Valley
1:00-2:30 p.m.	Inspect revegetation projects
2:30-3:00 p.m.	Load vans, travel to Big Prairie
3:00-4:30 p.m.	Discussion: Genetic considerations/revegetation planning/exotics
4:30-5:00 p.m.	Load vans, travel to restaurant for dinner
5:00-6:30 p.m.	Dinner at the Northern Lights Restaurant, Polebridge
6:30-8:00 p.m.	Load vans, travel to lodging
8:00 p.m.	Overnight at Lake McDonald Lodge

Glacier National Park has a revegetation program that significantly affects the biological diversity and genetic integrity of natural resources.

Three main points in this program follow.

- Restoration work seeks to use native species and ecological methods to assist nature.
- Management actions can be effective in reducing the influence exotic plants have on native flora if a comprehensive vegetation strategy is implemented.
- An informed/involved public is a critical element for successful implementation of large, controversial projects.

Statement of the Problem

Although there is a strong effort to be proactive, the revegetation program often reacts to influences on the resource. There is a diversity and interrelationship of goals within the park, including natural resources, visitor protection, planning, and maintenance. All work with vegetation, and action taken on one vegetative setting impacts others and therefore must be taken into account in developing a reclamation strategy.

Policy

- The National Park Service will seek to perpetuate native plant life as part of natural ecosystems.
- Landscapes and plants may be manipulated only when necessary to achieve approved management objectives.
- The National Park Service will strive to protect the full range of genetic types native to plant and animal populations in the parks by perpetuating natural evolutionary processes and minimizing human interference with evolving genetic diversity.

What are we doing about this in Glacier?

- Vegetation issues are identified in planning documents.
- We are building a comprehensive program of
  - inventory and monitoring
  - prevention
  - education and public information
  - project work
  - investigations

Vegetation Management Alternatives

Manage People and Use Patterns

- Zone designations
- Ecosystem planning
- Public information on prevention
- Enforce laws and regulations
- Define reasonable travel routes

Natural Succession

Vegetation Manipulation

- Remove vegetation
- Revegetation
  - site preparation
  - species selection
  - plant materials
  - planting and maintenance
- Preserve vegetation in cultural landscape

Restoration

Goals should start with the perpetuation of native species and protection of genotypes. There may be a need for modifying goals based on management objectives and site capability.

A strategy for choice of plant materials considers several alternatives in priority order.

- Species from the immediate site
- Species from the general area
- Species from the watersheds

Revegetation Program Glacier National Park 1992

INTRODUCTION

Centralized Resource Management Project System 1991

- Native cultivars
- Exotics

The designation of management zones allows for different vegetation strategies.

Plant materials program at Glacier National Park
- Seed collection and cuttings
- Propagation with the Soil Conservation Service (SCS) plant materials center and commercial nurseries
- Native plant nursery at Glacier National Park
- Experimentation with untested species

Resource management in Glacier National Park covers a wide range of projects and problems. Because it is unreasonable to expect to address all those issues in a single work season with limited manpower, a process has been developed that prioritizes areas of concern and initiates a work program for those issues of highest priority.

Each spring, subdistrict personnel and other staff members submit project information sheets that identify individual resource concerns. These information sheets are collectively reviewed by division staff and ranked in order of importance based on visitor safety, visibility, impact, degree of degradation, and funding.

The revegetation projects are ranked: (1) committed projects (mandated by funding or other obligations), (2) priority projects, (3) projects needing long-range management and planning, and (4) other projects. The committed and priority projects are targeted for completion during the current work season. Management plans and rehabilitation strategies are to be formulated for larger-scale projects. Additional nonpriority projects will be completed as time and personnel allow.

Following the prioritization process, resource management staff conduct site analyses and formulate implementation plans for each project. As projects are concluded, completion sheets are prepared that detail actual work accomplished and recommendations for additional work if necessary.

With assistance from trail crew, fire crew, subdistrict personnel, and volunteers, a five-person resource management implementation crew will complete rehabilitation efforts on all committed and priority projects.

Since 1987, funding for the construction and operation of the nursery has been provided through the Federal Lands Highway program. In 1992 partial funding for the nursery is provided from the park's base account. These funds have allowed us to collect and propagate plant materials and maintain a nursery stock to be used on revegetation projects within the park. These funds have also allowed us to collect data on many different native species, experiment with propagation techniques, and record our findings. These findings are used by us and by other agencies in revegetation with native plants.

The goals of the native plant nursery are to

- Collect and propagate native plant materials for revegetation projects.
- Maintain the biodiversity of plant materials at a project site.
- Protect the genetic integrity of our native plant populations.
- Learn best how to propagate native plants by experimentation and accurate record keeping.
- Maintain healthy nursery stock with the plant materials coming into the nursery from the SCS and from private contractors.

Glacier National Park Native Plant Nursery

Notes

Notes

Notes

August

11,

1992

August 11, 1992

Focus: Integrated Vegetation Program

7:00-8:00 a.m.	Breakfast, checkout, load vans (sack lunch)
8:00-8:15 a.m.	Travel to the Apgar picnic area
8:15-9:00 a.m.	Overview of the park roads program
9:00-10:30 a.m.	Tour 303B road project, Lake McDonald area: revegetation, maintenance, vistas, cultural aspects
10:30-11:00 a.m.	Load vans, travel to Avalanche picnic area
11:00-12:00 noon	Sack lunch at Avalanche picnic area
12:00-1:00 p.m.	Load vans, travel to Logan Pass
1:00-2:00 p.m.	Discussion: Revegetation, boardwalks, interpretation, rare plants, concentrated use
2:00-4:00 p.m.	Hike to Hidden Lake Overlook and return
4:00-4:30 p.m.	Load vans, travel to lodging
4:30 p.m.	Overnight at Rishing Sun Motor Inn
6:00 p.m.	Dinner at Johnson Cafe, St. Mary

Nelcon Inc. of Missoula, Montana, started road work in November 1990. After constructing the majority of cross drains, they stopped for the winter and picked up work in the spring. The project as contracted was finished in October 1991. The Park Service requested that a number of ditch excavation sections be laid back to a gentler slope to reduce slumping. This work will be done separately in early spring 1992.

Jack Gordon, the Denver Service Center liaison between the FHWA and Glacier, arranged with the FHWA and the contractor to salvage suitable topsoil from excavated ditches even though this operation was not in the original specifications. The salvaging entailed more work for the contractor during grading, but he had fewer expenses hauling the salvaged material out of the park and he was able to purchase considerably less soil. Topsoiling was completed on foreslopes of ditches, obliterated pullouts, modified turnouts, Apgar, and other areas where soil and plants were removed.

Although revegetation began in fall 1991, extended subzero temperatures and heavy snows in October put a major crimp in our planting plans. We hoped to get all the containerized material in and finish the seeding by the end of October. All we were able to accomplish was planting the containerized material in the Apgar area. Bareroot material to be delivered from Bridger Plant Materials Center was left to be dug in the spring of 1992.

There remains about 10 acres of revegetation to be completed by June 1, 1992. This includes roadside seeding along 9.8 miles of road and planting within 21 obliterated pullouts and parking areas. A planting pallet is completed that provides a guide for where all the plant materials will be located. Landscape architects Jack Gordon and Sue Nordstrom are providing drawings and sketches to use in plant location. Revegetation crews are hired and were scheduled to begin work on April 13, 1992.

A hydromulching contract was completed in 1991, and the contractor was recontacted in April.

There are other activities that are likely to occur during the revegetation that need to be coordinated:

- Bald eagle nesting along the shore of Lake McDonald requires compliance with bald eagle management guidelines.
- The contractor still has some work to do that could conflict with revegetation.
- Vista clearing and roadside brush clearing were scheduled to begin April 27. This will require close park coordination.

A number of problems were encountered with coordination between revegetation needs, the FHWA, and the contractor. There were difficulties with specifications for salvaged topsoil, timing of topsoiling treatment, and compaction of topsoil, and stabilizing shoulders. A complete and clear specification and better cooperation between the parties are needed to ensure success of future roadside revegetation programs.

Subalpine Sod Salvage, Glacier National Park

Incremental development and high visitor use at Glacier National Park's Logan Pass (2,032 m) have resulted in significant vegetation alteration and loss. Early efforts to revegetate disturbed sites either resulted in large denuded areas where transplants were taken or were marginally successful. When improved restrooms and handicap ramps were built in the 1980s, sod was salvaged from the site before construction and replaced after work was completed. We found this was a successful and practical way of quickly restoring native vegetation.

Before construction in 1986, hand crews and heavy equipment removed 630m^2 of sod. The 10-15 cm deep sod was placed on a 50/50 mixture of sand and peat in wooden boxes or beds lined with a water-permeable textile. It was watered with overhead sprinklers during the active growing season. The plants wintered well, with little mortality, and produced extensive root growth. In mid summer 1987, 400 m^2 of sod were replanted. Careful handling maintained root-soil contact. The replanted sod was watered until the onset of dormancy. Construction was completed in autumn 1988, and the remaining sod was replaced in 1989. There was not enough sod to cover the whole disturbed area, therefore, some hand-collected seed was also planted. The completed project will cost \$50/m^2 for labor, equipment, and supplies.

When improved restrooms at Logan Pass were first planned, we recognized that restoring disturbed vegetation would be a difficult task in the timberline environment. Sod salvage was selected after a review of the literature and evaluation of the previous revegetation efforts.

We found that this technique of transplanting and holdover was successful over a one- to two-year period. Although we realize that the plant community disturbed by construction was not completely restored, we were able to quickly revegetate the area with endemic plants.

Notes

August

12,

1992

August 12, 1992

Focus: Reclamation Strategies and Evaluations

7:00-8:00 a.m.	Breakfast, checkout, load vans
8:00-11:30 a.m.	Tour 303C-road project, St. Mary Valley: topsoil salvage, grading, revegetation sequencing, exotic plants, monitoring plots, wildlife, aquatic issues
11:30-12:30 p.m.	Lunch at St. Mary Lodge
12:30-1:00 p.m.	Load vans, travel to Many Glacier
1:00-2:00 p.m.	Reducing competition from exotic plant species, Many Glacier Valley
2:00-4:00 p.m.	Discussion, Many Glacier, Lucerne room: (1) Overall integration of revegetation with parks, regions, Denver Service Center, FHWA; (2) backcountry orientation and policies relative to revegetation; (3) housekeeping
4:00 p.m.	Overnight at Swiftcurrent Motor Inn

St. Mary to Rising Sun 303-C

In contrast to many years of delay on the Lake McDonald section, design and initial construction work on the St. Mary to Rising Sun segment has progressed rapidly. The contract was let and construction began in October 1991. The contractor has two years to complete the project.

Revegetation of this road segment presents some bigger challenges than the Lake McDonald section. Weeds, particularly knapweed (*Centaurea maculosa*), pose a greater threat in the drier, eastside climate. Likewise, harsh winds and low available soil moisture will make establishment of vegetation species difficult. This project will include large cuts and fills, with some very steep cuts located in a number of slump areas. There is no local source of topsoil other than salvaged material. Because much of the project is in or adjacent to grasslands, we need to be careful about the origin of the grass seed used. Because there is a significant probability that anything we plant will move into the adjacent grassland, we need to plant only material that originated in the immediate area. Seed production for the grassland species is difficult, due to limited field collections or difficulty with subsequent seed increases.

There will be significant area (3.5 acres) with 1.5:1 cut slopes. The likelihood of successfully stabilizing these slopes is slim. They will probably continue to erode and support little plant cover other than weeds. In some preliminary designs, the FHWA increased the slope of a number of cuts to reduce total disturbance acres. Dave Lange and Jack Gordon field-checked each of these steep cut areas and made suggestions to FHWA to lessen the steepness of the cuts in areas where the increase in cut would be no more than 10-20 feet.

A soil survey was initially done by Al Martinson and completed by Bill Basco in 1991. After this initial survey, each land-type section was checked for depth of salvageable topsoil and whether the old cutslope was weed free. The contract required the contractor to salvage all identified topsoil.

At Glacier National Park's request, the FHWA prepared a breakdown of disturbance acres for cut, and fill for each land-type. The total estimated disturbance was 18.6 acres.

We have been collecting seed for the last few years in anticipation of this project, stepping up our efforts considerably in 1990 and 1991. Trials were set up by the SCS on a number of these seed lots. In May 1991 additional seed increase fields were planted the SCS.

A small amount of seed may be available from seed increases in 1992, but if large areas are ready to seed this year, we will have to plant an interim sterile crop such as Regreen. All tree and shrub planting occurred in the spring due to the lack of dependable snow cover. The earliest that bareroot material will be available from the SCS is spring 1994. Alternatives would be to (1) plant available containerized material earlier, if the road project is complete or (2) wait for all tree and shrub planting until 1994. A drawback to the first alternative is that construction may not be complete by spring 1993, when we would have contracted containerized plants ready to go in the ground. Drawbacks to the second alternative include delayed recovery and a smaller size of plant.

Exotic Vegetation Management Glacier National Park

The *Exotic Vegetation Management Plan* for Glacier National Park has been completed following extensive public involvement and consultation. The plan was prepared in response to a growing concern about the spread of nonnative (exotic) plants in the park. A five-year course of action is proposed for managing exotic plant species while keeping the integrity of other park resources intact.

Native plants are an important natural resource in national parks. The invasion and spread of nonnative plants is considered to be a threat to the integrity of the park and ecosystem in general. The goal of the plan is to implement a comprehensive plant management program to preserve biological diversity of native species. Priorities are established for management actions based on ranking of exotics into categories, location of occurrence, and plant communities targeted for treatment.

Integrated pest management (IPM) is the procedure identified in the plan to control exotic plants in Glacier. This approach targets an individual plant species, then selects the method or combination of methods that will best achieve the desired management result. The objectives of IMP include inventory, research, public information and involvement, prevention, and control. Alternatives considered for weed control when IPM is implemented typically use the following treatments: cultural (pulling, revegetation); mechanical (cutting, mowing); biological (insects); and chemical (herbicides). The use of herbicides to control exotic plants is considered within developed areas if other treatments are ineffective or unacceptable in achieving control objectives.

Prior to implementation of control actions, site-specific IPM action plans are completed. Environmental assessments may also be included that evaluate consequences of the proposed actions. The park organized an informal consultation team of experts in the field of exotic plants to help implement the strategies. Their advice helps the staff plan for exotic plant control, identify biologically sound alternatives, and incorporate regional considerations.

Monitoring Revegetation Projects in Glacier National Park

The purpose of revegetation monitoring is to develop a cost-effective revegetation program based on scientific principles. With this purpose in mind, the following monitoring objectives have been established

- Develop revegetation techniques based on the information collected.
- Determine special requirements for specific environments.
- Identify needs and methods for remedial work at a site.
- Determine cause and effect relationships.
- Reduce time and money spent on revegetation.
- Set feasible expected levels of success and set reasonable time frames in which to expect those levels.
- Establish appropriate site-specific goals for projects.
- Determine the degree to which a project meets predetermined goals or expected levels of success.
- Identify sensitive areas where impacts must be avoided because revegetation is too expensive or impossible.

Because projects vary in complexity, different levels of monitoring will be developed. Simple projects will receive cursory monitoring and complex projects will receive more detailed monitoring. The monitoring level and schedule to be used on a project will be stated in the resource management project implementation plan. The levels are as follows.

- Level I monitoring determines if revegetation has adequately stabilized soil on the site and the site visually blends in with the surroundings. Projects with level I monitoring are those that are small and/or routine, using standard, proven techniques. Comparison plots are rarely used. (If such plots are involved, then level II or III monitoring should be considered.) Level I monitoring can be conducted by various park personnel with minimal training.
- Level II monitoring goes beyond level I in that it determines the success of planted species and briefly describes the dominant vegetation of the site based on ocular estimates. Successional trends can be monitored on a gross scale. Projects include those where survival of transplants or nursery stock is important, those where revegetation success is questionable, and those where a general vegetation description is necessary. Comparison plots may be used.
- Level III monitoring goes beyond level II in that it determines successional trends and develops a complete species composition list. Quantitative sampling will be done in permanent, randomly located plots. Projects should be those where revegetation success is questionable due primarily to location and uncertainty of the revegetation techniques. Comparison plots should be used. Control plots may be used; however, level IV monitoring should then be considered.
- Level IV monitoring is for experimentally designed mini-research projects. Replicates of control plots as well as comparison plots will be established (replicates may be obtained by using microplots at a site, rather than by using many similar sites). Mini-research projects are undertaken where substantial revegetation is needed using new techniques or in areas where revegetation is critical.

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August

13,

1992

August 13, 1992

Focus: Backcountry Reclamation

7:00-7:45 a.m.	Breakfast, load vans (sack lunch and hiking gear)
7:45-8:00 a.m.	Drive to boat dock
8:00 a.m. sharp	Group meets at boat dock/Many Glacier
8:00-9:00 a.m.	Boat ride to trailhead
9:00-12:30 noon	Hike to Grinnel Glacier, 4 miles: revegetation, biodiversity, gene pool
12:30-1:00 p.m.	Sack lunch at Grinnel Glacier
1:00-2:00 p.m.	Hike to Grinnel Glacier overlook and return (optional)
2:00-4:20 p.m.	Return hike to boat launch, 4 miles
4:20-5:15 p.m.	Return boat trip to Many Glacier
5:15 p.m.	Overnight at Many Glacier Hotel

Grinnell Glacier Picnic Area

Grinnell Glacier has traditionally been a popular destination for day hikers in the Many Glacier Valley. The 8.3 kilometer (5.2 mile) trail starts at the Swiftcurrent picnic area and passes along the western edge of Swiftcurrent Lake as well as much of the northern shore of Josephine Lake. It then gradually climbs 1,300 feet to reach the picnic area at an elevation of 6,420 feet. This trail passes above Grinnell Lake and continues on to Moraine Point and the glacier itself.

The picnic area is a subalpine forest grove dominated by subalpine fir and various shrub and forb species.

There has been heavy use of this area for over 50 years. Overnight camping with horses was allowed until the early 1970s. Although these activities are no longer permitted, their impact is still apparent.

Visitation numbers for this site are impossible to estimate, but naturalist-led parties of up to 50 people visit the area daily throughout the summer. Estimated day use for the entire 1988 season for the Grinnell Glacier trail totaled 11,300 people.

Prior to 1986 there was no seating provided for visitors to the area. Because this is a popular lunch spot, people dispersed throughout the fragile meadow and trees. Packs were often hung from tree branches because of an aggressive ground squirrel problem. In 1986 several seating benches were installed, and interpretive signs explaining the revegetation efforts were placed in the meadow. Trails to the outhouses and outdoor seating were delineated, and social trails were blocked and revegetated with transplants. This work continued in 1987 and 1988.

In 1989 the picnic area was classified as a high visitation backcountry management zone. The site was photographed, mapped, and evaluated. It was decided to remove the existing men's outhouse from its location near the stream. It was apparent that the area of dead trees would be extremely difficult, if not impossible, to reclaim and that our efforts would be better spent on the less impacted sites. For this reason it was agreed that the men's outhouse would be relocated to this abused site, just uphill from the women's outhouse. The outhouse was moved in fall 1989, and two additional outdoor seating benches were installed in 1990.

In comparing older photographs of the area, it appears that our efforts to mitigate some of the impacts to this site have been partially successful. The naturalists have done a fine job of including a message in their interpretive talks about the vulnerable nature of subalpine areas and our restoration efforts. Revegetation work and monitoring of this area is recommended on an annual basis due to the fragile nature of this ecosystem and its high use.

Notes

August

14-15,

1992

August 14-15, 1992

Focus: Issues and Concerns for Management

7:00-8:00 a.m.	Breakfast, checkout of lodge
8:00-10:00 a.m.	Load vans, drive to Lake McDonald Lodge
10:00-12:00 noon	Discussion: Ethics in Reclamation
12:00-1:00 p.m.	Lunch at Lake McDonald Lodge
1:00-1:30 p.m.	Load vans, drive to community building/headquarters
1:30-3:00 p.m.	Close out, review, comments
3:00-4:00 p.m.	Depart for Whitefish and lodging, or airport
4:00 p.m.	Overnight at Grouse Mountain, Whitefish, Montana
	Return home via Kalispell

Land Ethic

It is important to keep a clear focus on land ethic.

- Develop a mutually beneficial relationship between humans and the rest of nature: respect for the land.
- Restoration is a healing process: we can't fix what we break, but we can put some pieces back together and let nature heal herself.
- Try to reduce or prevent human disturbance because we recognize the value of native species.
- The science of restoration ecology is not a justification to tear up a piece of ground because it can be revegetated.

Notes

As the nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural and cultural resources. This includes fostering wise use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historical places, and providing for the enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people. The department also promotes the goals of the Take Pride in America campaign by encouraging stewardship and citizen responsibility for the public lands and promoting citizen participation in their care. The department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

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