



TechLine

Information About Invasive/Exotic Plant Management

Summer, 2002

Success at Educating Your Constituents Keys Vegetation Management Progress

Managing invasive or exotic vegetation on private lands offers many challenges. On public lands these challenges are multiplied by the very fact that the lands are owned by the public. Citizens must have a say in how the lands that are held for them in trust are managed. However, the average citizen does not often possess a good working knowledge of natural resource management. Each person brings their own experience and predispositions to the debate on how invasives are to be managed on open spaces, wildlife habitats, trail systems, and forests that comprise most publicly owned lands.

The public land manager's task is made more difficult because all the voices of the public must be balanced with the task at hand. Often times these public voices simply state that no management should occur and vegetation programs lose their funding and can be stopped completely. More often, the public simply limits the tools available to the public weed manager, which can also disrupt or stop progress.

Public vegetation management programs ebb and flow with the support or lack of support of local citizens. How does a successful public vegetation manager become successful and sustain progress? This issue of *TechLine*TM newsletter details how several programs overcame the obstacles presented by the public. If there is a common thread through all these programs it is that these managers never, never gave up. They kept searching and experimenting until they found the keys to involving the public and gaining their support for their vegetation management efforts.



“In the end we will conserve only what we love; we will love only what we understand; and we will understand only what we have been taught.”
...Baba Dioum

INSIDE TECHLINE

Missoula Rebuilds Weed Management Efforts

Page..... 2

Tribal Weed Managers Overcome Obstacles

Page..... 4

Flathead County and Glacier National Park

Pages 6 & 8

Progress Returns to Missoula Weed Management Programs

“De-emphasize Large Public Meetings and Increase the Opportunities for Personal Interactions”

By Charles Henry
TechLine Editor

It would be difficult to find a public vegetation management program in the western United States that has had more starts, adversity, and stops than in Missoula, Montana. Since the 1920s spotted knapweed and other invasives have plagued public and private Bitterroot Valley landowners. At times the county and city programs have been shuttered completely due to citizens' misunderstanding about the role herbicides play in weed management. By 1990, apathy, anti-herbicide sentiments, and hopelessness had stymied progress.

Open Space Values

Mt. Jumbo is home to a winter elk herd and mule deer population. Most of these properties are comprised of bunchgrass communities with some forest, open grassland, and alpine plant communities. They contain some rare plant species, but none that are listed as “Threatened & Endangered.”

Recreational values are high with the dominant uses being hiking, mountain biking, bird watching, bow hunting, horseback riding, and parasailing. Noxious weeds interfere with all the goals for this open space.

All of the open space lands were highly infested with spotted knapweed by the mid-nineties. Leafy spurge infested 10% of Mt. Sentinel and 60% of Mt. Jumbo. Dalmatian toadflax infested 60% of Mt. Jumbo and all of Mt. Sentinel and sulfur cinquefoil was also prevalent on more than 50% of both mountain properties.



Kate Supplee (left) and Marilyn Marler coordinate vegetation management programs for Missoula and the University of Montana.

“In 1991 a Citizens’ Advisory Committee on Open Space proposed that Missoula city and county officials work with local citizens to plan for an urban open space system. By 1993, the city had funded a pilot project and funded an open space planning position,” explains Kate Supplee, open space program manager today. “We were fortunate that city voters passed a \$5 million open space bond in 1995. This enabled us to begin to make the plan a reality by purchasing cornerstone lands, those that form the backbone of our open space system.”

In acquiring open space, Missoula officials focused on views and vistas, wildlife habitats, recreational lands, and corridor properties that linked city open spaces around the Missoula Valley. Initial acquisitions included nearly 3,500 acres, including the North Hills, Mt. Jumbo and Mt. Sentinel foothills that define the north and eastern edge of Missoula.

These lands support the largest contiguous infestation of leafy spurge, knapweed, and Dalmatian toadflax found on public land in Western Montana. “Our primary goal was just to keep these areas void of development and open, but today recreational use on these lands has increased substantially,” Supplee explains. “At the time we purchased these lands we were aware of the weed infestations, but not fully cognizant of the true extent of the problem. Nor did we ever anticipate that the city would be initiating a full-blown noxious weed program within the next five years.”

The University of Montana owns prominent pieces of property in and around Missoula, so it was brought



Mt. Jumbo (left) and Mt. Sentinel above the university campus were among Missoula lands that support the largest contiguous infestation of leafy spurge, knapweed, and Dalmatian toadflax found on public land in Western Montana.



into the planning process. The city now contracts with the university to provide a weed coordinator, Marilyn Marler, for nearly 3,500 acres of city open space and 600 acres of university land. Each entity has its own weed plan, but they coordinate for management implementation.

“In 1995 the state legislature passed House Bill 395 that requires all state and city agencies to address noxious weed problems,” Marler explains. “A university committee wrote a weed plan in 1996 that included helicopter applications of herbicides on Mt. Sentinel. The public stopped plan implementation almost immediately. People did not understand the problem and they became polarized around the use of herbicides rather than focusing on the ecological damage caused by the weeds,” Marler states. “The use of a helicopter was a huge stumbling block.”

A different university committee wrote another plan that did include spraying, but not aerial application. This plan finally passed in 1998. A year later Marler’s position was funded to implement the plan. The city was undergoing a similar parallel process of planning land purchases during this same time period. Supplee says the city watched the university plan evolve and avoided many of its initial mistakes.

Never Give Up

How did the city of Missoula and the university turn public sentiment around? What changed people’s minds about herbicide use on public open space lands? Marler and Supplee say the one single technique that enabled them to progress was de-emphasizing large public meetings and increasing the opportunities for personal interactions. They say that at large meetings it is difficult to answer questions effectively, the media tends to report only the most inflammatory comments,

and everyone leaves dissatisfied that they were not heard.

“The public and local media must be involved, but we are so much more effective talking with people one on one or in smaller groups,” Supplee says. She describes their other successful techniques:

- Personal contact of local conservation and other user groups.
- Public hand weed-pulling events on the trail

See “Missoula” on page 11.

Missoula Integrated Weed Program

1. Sheep are grazed on leafy spurge and some spotted knapweed sites.
2. Biocontrol insects were released on leafy spurge and dalmatian toadflax infestations.
3. Handpulling on trails. They established an “Adopt-a-Switchback” paired with educational programs on the Mt. Sentinel trail.
4. Herbicide applications with truck, ATV and backpack sprayers. Crews treat spotted knapweed with Tordon* 22K herbicide at 1 pint per acre. Dalmatian toadflax and leafy spurge are treated with Tordon 22K at 1.5 pint per acre. Transline* herbicide is also used to treat spotted knapweed at 10 oz./acre.
5. Llamas are used at times to haul water for the backpack sprayers.
6. Test plots using controlled burns in combination with herbicides and other treatments are also underway.

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Tordon 22K is a federally Restricted Use Product

Success Is A Great Motivator

Preserving Cultural Plants Keys Weed Management Acceptance

By Charles Henry
TechLine Editor

Native American tribal land managers face many of the same challenges as other land managers. However, added to their tasks are the protection of medicinal and cultural plants that are so important to maintaining tribal traditions and heritage. Dan Jackson, weed coordinator for the Confederated Salish & Kootenai Tribes in western Montana, says it was fear of damaging these essential species that caused the tribal council to ban all herbicides on the reservation 30 years ago. The ban came at the worst possible time as spotted knapweed and several other species were exploding on the reservation about that time.

“In 1988 the BIA appropriated \$20,000 for the tribe to conduct weed management,” Jackson explains. “Since we didn’t know which tools we would be allowed to use for weed control, we decided to use that money for inventory and planning. We had to show the tribal council the negative impacts of noxious weeds.”

Doug Dupuis, tribal land manager, says they also

Biocontrol Program

Virgil Dupuis, extension director at Salish-Kootenai College, oversees the tribe’s biocontrol program. Eighty release sites are established where they monitor range condition and insect survival.

“In addition to the biocontrol work, we use student interns to map weeds after forest fires and monitor infestations,” Dupuis explains. Insects released and monitored by the students include *Agapeta zoegana* and *Cyphcleonus acahates* on spotted knapweed, and *Apthona nigriscutis*, *Apthona flava*, and *Apthona esula* on leafy spurge.

Insects are difficult to obtain, so the college works hard to rear as many of their own as possible.



(Left to right) Dan Jackson, Virgil Dupuis, and Doug Dupuis spearhead the Salish & Kootenai Tribes vegetation management programs that have achieved success through tribal education and awareness building.

decided on a total integrated management approach using a priority system to protect certain land types first. Grazing is one of the key uses of tribal lands so this approach was risky since grazing allotments would be modified and some dropped entirely (see Reservation Resources sidebar).

Dupuis and Jackson’s first success was demonstrating the damage weeds did to big game winter ranges through range monitoring, forage measurements, and demonstrations. Next they tackled objections to herbicides through coordinated research with Peter Rice at the University of Montana. Medicinal, cultural, and edible native plants were tested for herbicide sensitivity and residues. Working with the tribe’s Cultural Preservation Office, they demonstrated that selective herbicides could be used for weed species without harming these critical cultural plant species.

“We took an educational approach over 5-6 years. Slowly we won people over including the tribal council,” Jackson says. “Education continues to be a strong component of our program, including in the schools. And we gave residents the opportunity to participate.”

The tribe turned the biocontrol portion of their program over to the Salish-Kootenai College on the reservation. The college developed their own insect rearing program and handles all releases, monitoring, and plant restoration in riparian areas (see Biocontrol sidebar).

Today tribal weed managers treat nearly 6,000 acres annually with herbicides. This acreage is limited by

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funding (see Integrated Techniques sidebar). Reservation lands are treated under a priority point system with native grassland areas currently receiving the highest priority. All lands must have a completed Environmental Assessment (EA) and they blend tribal weed programs with private landowner projects whenever possible. This process first lists resources of concern, then mitigates these concerns before any fieldwork is begun. This way, objections can be anticipated and answered before work begins.

“Not doing a project at all is better public relations than beginning a project and having it stopped for some reason,” Jackson concludes. “Success is the best motivator. We conduct tours and educational events in areas where we have managed weeds to demonstrate the improvement in the resources. We conduct wilderness area education with school children and adults. All our education is a continuing effort. Some people will always have concerns about our management tools, but we have changed most attitudes so people understand that the weeds are worse than the methods used to control them.” 

Reservation Resources

The Confederated Salish & Kootenai Tribes of the Flathead reservation was formed by the Treaty of Hellgate in 1855. Today the reservation is comprised of 1.3 million acres including 76,000 acres of water bodies, 700,000 acres in tribal trust land, 450,000 acres of private fee lands, and the 20,000-acre National Bison Range.

Reservation land is comprised of forest, native and improved rangelands, and farm ground where potatoes, corn, alfalfa, and cattle are raised. Elevations range from 3,000 to more than 10,000 ft. and the area receives 12-inches of annual precipitation.

The rangeland is threatened by spotted knapweed, sulfur cinquefoil, leafy spurge, goatweed, Dalmatian toadflax, and diffuse and Russian knapweed. Grazing capacities have been adjusted continuously since the 1940s as managers learned more about their true holding capacities, thus range condition is improving overall.

Spotted knapweed and goatweed, spread by vehicles, are encroaching on forest lands. Whitetop, bindweed, and Canada thistle are the greatest problems on the farm ground.

The tribal resource plan calls for multiple use of resources, but also states that not every acre should be in use. They follow a cross-discipline approach that establishes goals and objectives for all areas. Of course, one of their primary goals is to keep invasive weeds out of areas containing cultural or medicinal plants of importance.

Mechanical Control: Some areas allow for plowing and re-seeding, but these treatments can cost \$110 to \$120 per acre, so they supplement these practices with herbicides to reduce costs if possible.

Chemical Control: Nearly 6,000 acres are treated with herbicides annually. Helicopter application is used on 95% of this acreage. They use Tordon* 22K herbicide and Redeem* R&P herbicide in

Integrated Techniques

range areas, Transline* herbicide in the forests, Escort herbicide for whitetop control, and aquatic 2,4-D in riparian areas. Since spraying was allowed to resume, they have observed no damage to tribal cultural plants nor have herbicide residues been found in these plants after testing by the University of Montana.

Grazing: Grazing is not used for weed control yet, although they always evaluate if sheep or goats would fit in certain areas. However, grazing management is very much a part of their weed control efforts.

They defer grazing for two years after herbicide treatments for cultural plant protection and range restoration. Some lands may be switched to fall grazing and other parcels are idled completely after weed control.

Burning: Burning is being

evaluated as a set-up treatment for herbicide since many areas that need to be treated contain a heavy over-story of vegetation. They have completed three wildlife habitat area burns using herbicides in combination with burning.

Prevention: Tribal weed managers require cleaning of all logging and gravel pit equipment to prevent the spread of weeds. In addition, they pre-treat timber sale locations to minimize spread.

Revegetation: The tribe has developed their own seed mix for re-seeding on roadsides and in forest areas after soil disturbances or after weed treatments.

Flathead County

Agencies Working Together Cut Weed Infested Acreage

Diverse land ownership and management can make invasive plant management almost impossible at times.

Every agency has its own priorities, budget constraints, and public opposition problems for the land they manage. When a county comprised of only 17% private ownership with the remainder in some type of public ownership cuts weed infestations in half in ten years it is worth noting. Spotted knapweed infested acreage (the area's largest weed threat) has declined from 80,000 infested acres to 40,000. All other weed species are showing declining populations.

Flathead County, MT

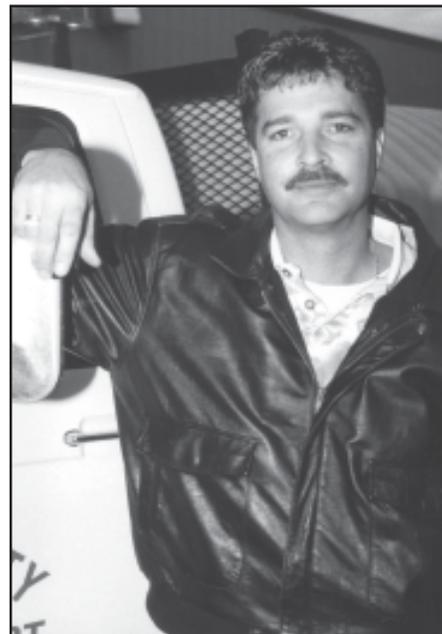
The county encompasses 51 square miles of forest, farmland, open range, parts of a National Park, and the largest natural lake in the state. The county's population has nearly doubled in 10 years.

Flathead County weed superintendent Jed Fisher in Kalispell says if he had to pick one reason why they are making progress it would be the change in attitude of county commissioners ten years ago. "Back then we put nearly all our efforts into educating the commissioners first. Once they became convinced, they were willing to budget our department on par with the transportation and sheriff's office. We determined that most effective uses of our new budget resources would be education, roadside mowing, bio-control, and herbicide applications, in that order."

Fisher admits that ten years ago one of their problems was that they did not present a professional image around the county when doing weed control, so this was one of the areas he attacked first. Whatever equipment they used was maintained in top shape, employees were dressed in the right attire, and they were educated to answer the public's questions about weeds, their impacts, and their control techniques.

Next, Fisher went to work on building cooperation from the various agencies that managed land in the county. Many of these agencies were contracting out their weed management then, but today they do much of their own, which is an indication of their commitment, he says.

*By Charles Henry
TechLine Editor*



Flathead County weed superintendent Jed Fisher in Kalispell says if he had to pick one reason why they are making progress it would be the change in attitude of county commissioners.

"In 1991, total weed management budgets in the county totaled only \$300,000 from all agencies including our county budget of \$150,000. In 2001, this total has reached \$2 million for all agencies and our county budget is nearly \$500,000 annually," Fisher states. "Once other agencies saw that the county was willing to put its money where its mouth was, they gradually came on board," he says. In brief, Fisher describes how several of the agencies in Flathead County have developed their weed management in conjunction with county efforts:

Flathead National Forest

Jay Winfield, forest range specialist who is now assigned to the Helena National Forest, was the first to identify backcountry weed sites in the Bob Marshall Wilderness Area. Winfield found 108 sites and then controlled the weeds on those sites using backpack sprayers, horse pack sprayers, hand pulling, and hand grubbing. At the same time, Winfield educated the District Ranger and Forest Supervisor about the threat of these infestations.

This early success enabled forest managers to move aggressively on Tansy ragwort outbreaks after the Little Wolf fire in 1994. The District Ranger in the Tally Lake R.D. had a herbicide control program in place in one year with all NEPA and Environmental Assessment (EA) requirements completed. Tansy ragwort infested acreage was reduced from 15,000 acres to 10,000 acres

in a very short time period. This success enabled Cathy Barbeletos, Forest Supervisor, to support a forest-wide EA for weed control.

Department of State Lands

Ten years ago weed budgets totaled zero for the Department in the county. Last year the department's budget was \$20,000 used to contract with the county. In addition, the department's forester, Beverly O'Brien, assisted in obtaining a \$70,000 grant from the Montana Noxious Weed Trust fund for weed control on 2,000 acres burned in a forest fire. This money was leveraged with cooperation on adjoining Plum Creek Timber property that was also burned.

Montana DOT

As the county's population has exploded, the need for right-of-way weed control also increased. The department has implemented a control program using Curtail* herbicide and Tordon* 22K herbicide. In addition, they have implemented extensive revegetation on a new internet service line that was buried throughout the county and on all other road construction.

Montana Fish, Wildlife & Parks and U.S. Fish & Wildlife

From no weed control ten years ago, each agency now contracts with the county for weed control on fishing access sites and other lands managed by the agencies. This includes a cooperative weed control project on the Lost Trail Ranch with the Rocky Mountain Elk Foundation to control spotted knapweed on elk habitat with Tordon 22K herbicide and Transline* herbicide applied by helicopter.

Municipalities

The cities of Kalispell, Columbia Falls, and Whitefish all have their own weed crews now and/or contract with the county for control work.

Burlington and Sante Fe Railroad Bonneville Power Administration Natural Resources Conservation Service

All these agencies have implemented weed control programs in Flathead County in recent years. The NRCS created a low-income assistance program for landowners or tenants who could not afford weed control on their own.

Stoltz Land & Lumber

One of the largest landowners in the county, the timber company now budgets \$30,000 annually for weed management.

Fisher says he meets at least annually with each agency to set a yearly weed plan and budget. "Without interagency cooperation, none of us would have

Tools for Success

Flathead County has built a successful invasive weed management program on the basic tenant of educate first, control weeds second. This is reflected in the county's new weed building. Although the \$700,000 structure will be used to house and maintain equipment, a substantial portion of the new building is also devoted to classrooms and meeting rooms for education.

Here are the additional tools Fisher and his staff have developed to create progress:

1. **Commitment to all weed control techniques:**
 - Revegetation of all disturbed county right-of-way sites and new subdivisions receives high priority.
 - Biocontrol is another tool used extensively as they have more than 200 insect release sites on all weed species throughout the county.
 - Mechanical control is used via four roadside mowing units that mow rights-of way four months out of the year.
2. **Education and Compliance:**

Fisher's department runs radio and print ads, county fair and bank displays, and tours to educate residents and public officials about their program AND successes. They have conducted tours in the Flathead Forest and Glacier National Park. Fisher says they publicize EVERYTHING.

The county conducts education classes for kindergarten through 12th grades, focusing on biology and science classes.

Fisher conducts tours in areas where they have had success to show the public and land management agency managers how biodiversity increases when the land is weed-free. They demonstrate the lack of tree damage and absence of water contamination when using herbicides through extensive testing and then publicizing the results.

They do full-time compliance handling nearly 300 cases per year. They will create weed plans for many of these properties knowing that is a more positive approach than just enforcement.

3. **Prevention – Flathead County annually inspects seed packets sold in local nurseries and discount stores. They inspect all hay that comes into the county including Canadian shipments.**

achieved the success we have in the past decade," he concludes. 

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Park Resources Worth Protecting

The most significant scientific feature of GNP's flora is its diversity. Approximately 70 percent of the park area is vegetated. The park is a melting ground for species representing five major floristic provinces. In addition to the predominant Northern Rocky Mountain flora, many species of Great Plains affinities grow along the eastern slopes, and a wide variety of arctic-alpine plants occur above timberline. Numerous Pacific slope and boreal species reach their southern and eastern limits in the park.

Major factors contributing to this high floristic diversity include the contrast between climates of the east and west sides of the Continental Divide, the sharp topographical relief, and the wide range of soil acidity or alkalinity.

The vast vegetative diversity of these varied habitats provides a significant reservoir of genetic material with more than 1,050 vascular plant species. Thirty-six rare Montana plants have been recorded in GNP of which 18 are found only in the park and its immediate environs.

Of the acreage west of the Continental Divide, 59% is coniferous forests, 11% is open herbaceous meadows and prairies, 6% is deciduous forests and shrub communities, and 24% is unvegetated.

Engelmann's spruce (*Picea engelmannii*) and subalpine fir (*Abies lasiocarpa*) form the bulk of the west side's coniferous forests. Western larch (*Larix occidentalis*) is a seral component of most forests.

Expansive prairies with occasional big sagebrush (*Artemisia tridentata*) are located along the wide valley bottom. These fescue grasslands are an ecologically significant habitat type. The largest grasslands appear to occur on coarse, well-drained alluvial substrate. Common native species include rough fescue (*Festuca scabrella*), Idaho fescue (*Festuca idahoensis*), kinnikinnick (*Arctostaphylos uva-ursi*), pussy-toes (*Antennaria sp.*), yarrow (*Achillea millefolium*), and silky lupine (*Lupinus sericeus*).

On very moist sites in the McDonald valley, western redcedar (*Thuja plicata*), western hemlock (*Tsuga heterophylla*), grand fir (*Abies grandis*), western white pine (*Pinus monticola*), and pacific yew (*Taxus brevifolia*) are common. These forests are among the oldest late successional forest stages in the park.

Glacier National Park

Doing Nothing Means Resources Will Continue to Degrade

Established in 1910, Glacier National Park represents world-class values in natural resources. The diversity of plants and animals existing in the Park occurs only rarely elsewhere on the entire planet (see Resources sidebar). Invasive exotic plants threaten many ecosystems and habitats throughout North America, including Glacier National Park. However, the sheer breathtaking beauty and richness of the resources found in Glacier somehow bring greater focus to the problem when exotics threaten these resources.

Biologist Dave Lange has been at the forefront of managing exotic and noxious plants in Glacier for more than 10 years. He retired recently and has now passed the reins to Dawn La Fleur.

"Noxious and exotic vegetation are robbing the public of its natural resource heritage when they infest an area like Glacier National Park," Lange and La Fleur explain. "Often the public simply wants Park managers to just leave everything alone and not do any active management. But exotic plants don't give us that option. Doing nothing means the resource will degrade due to exotics' invasion and spread."

In an honest assessment backed by several years of inventory and monitoring, there are nearly as many acres of Glacier infested with exotics as there were ten years ago, according to Lange. However, the good news is that without active management in those ten years, the acreage would have expanded exponentially.

"It has taken time to establish the integrated management techniques needed, obtain the funding and manpower to implement our management, and to complete the studies and environmental analysis (EA) required by law to fight exotics in the Park," Lange explains. "I think we will see much greater progress, in fact our goal is a 30% reduction in infested acres, in the next few years."

One of Park managers' greatest hurdles was convincing the public to allow the use of herbicides

By Charles Henry
TechLine Editor



Dave Lange (left) has led the battle against invasives in Glacier National Park for the past 10 years. Revegetation after weed treatments (above and below) are a key component to the Park's weed management strategy.

and biocontrol tools in the Park to control weeds. "If we did one thing right in the beginning it was that we asked the public's permission first," Lange describes. "Glacier was like a polarized environmental fishbowl divided between those who wanted us to go all out to eradicate exotics by any means necessary and those who said don't touch it. Thus, we did go slowly, but that is paying off in the long run."



Park managers first focused on the threat invasives pose to natural resources. This was conveyed in messages throughout the park including visitor centers, signs, and literature. Next they decided management strategies would:

- Be based on Park-specific research
- Be science based
- Involve the public
- Stress that "this is our watch" and that the future fate of the resource would be our responsibility now, and
- Protect, enhance, and restore the resource.

Lange says they decided to place signs at every treatment for public education and deal with issues upfront rather than allow them to fester and stop projects later. We run an open, visible program, mistakes and all, he says.

"We determined it was best to begin small with small successes. We built knowledge and established a team approach," Lange says. "I can't stress enough how important it is to involve and empower your field people, including seasonals. We delegate weed control responsibilities to everyone, including backcountry rangers, ecologists, botanists, wildlife specialists, and seasonals working in these fields. We have staff

reporting infestations because they see the progress and success of our control programs and they want to contribute."

"We have developed the capability and resources within Glacier National Park to plan, implement and monitor for noxious weeds. Since our Integrated Pest Management program has been operational since 1991, we have established a network of professional contacts and peers. The costs are the result of input from county, state, federal, tribal and private consultants. They supplement the investments already made to our program in order to expand our capability by adding a crew to the operation," Lange explains.

"I view exotic plants as an illness infecting the Park's ecosystem. When we fight an illness in a person, we often prescribe medications to assist a cure. In the same way we use herbicides to assist the Park in regaining its natural health," Lange explains. This was the approach Park managers took to educate and convince the public to allow them to use herbicides.

Of specific interest is the planning process and how it was implemented. Following extensive public involvement, the Exotic Vegetation Management Plan

See "Glacier National Park" on page 10

“Glacier National Park”

Continued from page 9

was approved as a five-year strategy that utilizes Integrated Pest Management as a means to reduce the influence of exotics on native plants. The consequences of implementing the strategies are evaluated in project specific environmental assessments. Infestations are surveyed and recorded in the GIS, and monitoring plots has provided a statistical means to document results of treatments on native and exotic species.

Opportunity for success from herbicide treatment is highly likely because the populations at the outer edge of the infestations are young and not well established, with minimal seed establishment in the soil bank.

Weed Management Staff and Equipment

Current funding includes the park base account, service and agency funds. Control actions are implemented through six Project Statements within the Resources Management Plan for Glacier National Park. Four full-time equivalent employees are designated specifically for exotic plant management, with a financial commitment of \$150,000 per year under current funding levels.

There is a full-time permanent biologist that supervises the exotic plant program. He/she supervises a permanent biological technician and six seasonal weed technicians and six seasonal restoration technicians that implement the exotic plant control program park-wide. The funding source for the biologist and biological technician is the base vegetation account. Most of the crew salaries are from project accounts. The funding commitment has doubled over the last five years.

These dedicated weed technicians have two 300-gallon slip-on units and six backpack spray units at their disposal for herbicide work. They are trained to be self-contained to implement all components of weed management – planning, implementation, and evaluation – except for research.

Cooperative Agreements with the Flathead National Forest, Glacier County, Flathead County, Blackfeet Indian Tribe and Bureau of Indian Affairs specifically state how neighboring agencies can support each other. These include joint databases and inventories, public information, training, supplies and equipment, joint insectories for biological control, shared expertise such as revegetation, and sharing of crews for prioritized control projects.

Four years of monitoring data from treatments in the developed zone indicate a reduction of weed cover, with an increase in grass and/or forb cover. The monitoring data suggests it is possible to control weeds without eliminating native species, which substantiates research projects outside the park.

“The park is prepared to expand revegetation to exotic treatment areas where weed cover is removed. The park has developed the expertise to propagate and plant native vegetation for restoration projects. The park has an operational native plant nursery and greenhouse for propagation, and a revegetation crew for planting. Park crews have fifteen years of successful experience revegetating disturbed areas with native plants,” Lange explains.

Biological agents are established in consultation with Norm Rees of Agricultural Research Services and Jim Story of Montana State University. Insects are obtained from ARS or purchased to insure enough insects are available to establish adequate populations on the sites. The sites are surveyed before and after establishment of insect populations, and monitored periodically. Insects selected are species that have successfully established at similar sites within the region.

The costs are conservative and represent four years of experience with implementation of Integrated Pest Management within the region. The concept is based on hiring their own crew composed of seasonal biological technicians, and coordinating our efforts through cooperative agreements. These agreements provide for the sharing of human and physical resources within the region in order to work together, make ecologically sound decisions and be most cost effective.

The park staff also has the technical expertise and capabilities to integrate the revegetation component into the project based on fifteen years of experience with restoration using native plants.

Transferability

The results of Glacier’s exotic plant strategies have significant interest for all resource managers concerned with vegetation management. Glacier National Park has planned and implemented a unique holistic approach to vegetation, and applied it on an ecosystem scale through cooperative agreements with neighbors. Revegetation, roadside maintenance and backcountry management are coordinated in with exotic plant strategies. The results of this work are presented in written reports and presentations at regional and national conferences. Planning documents and reports have been shared with land managers throughout the country.

“Missoula”

Continued from page 3

switchbacks up Mt. Sentinel. This made people part of the solution and offered educational opportunities to teach about all weed management tools on a more personal level.

- Established ongoing demonstration areas that illustrated all the integrated tools available. The goal was always to manage for native species and ecosystem restoration.
- Conducted nature hikes that asked groups to assume a stewardship role.
- Involved dozens of school groups in weed-related field trips.
- Gave public talks to the Native Plant Society, service organizations, and other public groups.
- Conducted specific tours for city council and county officials.
- Had the city health department conduct water monitoring and testing for herbicide residues.
- Erected educational signage for all projects.
- Informed citizens before spraying.
- Formed the Missoula Open Space Weed Management Area to bring adjoining landowners into the program.

“Some people’s minds did not change and others said weed management was a waste of time,” Supplee states. “But once we demonstrated that the weeds were the problem, not the herbicides and that we were committed to using all integrated weed management tools, not just herbicides, public support followed. Success has also helped, she says. After three summers of weed management, they observe several 20-30 acre sites free of weeds that demonstrate what healthy, diverse ecosystems look like. “Our first weed plan took four years before approval. Our most recent plan was approved in several weeks,” Supplee says. “The planning process we use evolved considerably. The

initial plan for Mount Jumbo was written by a citizen’s committee while the second plan, for the North Hills and Mt. Sentinel, was drafted by Marler and then brought to an open house for public review and comments.”

Marler and Supplee invited several speakers to the open house, such as Missoula’s mayor, who gave supportive weed management talks. They held the event in a large meeting hall, but kept a friendly, intimate feeling by asking volunteers to host tables around the hall featuring native plants, herbicide education, weed identification, revegetation, and other topics. This enabled the public to focus on their interests and insured that their voices were heard and questions answered.

“We found that people really enjoyed the open house, especially the informal conversations and exchange of information. They asked us to do more. This year we turned the open house into a ‘Weed Fair,’ using the same basic format and venue but focusing more on the positive work that’s happening in the Missoula Valley. Dr. Roger Sheley, Montana State University weed specialist was our keynote presenter. We also utilized ‘roving weed experts’ throughout the Fair that proved to be very popular.”

Supplee notes that recent weed progress in Missoula has been supported by both the County Extension Office and Citizens for a Weed Free Future (CWFF), a group of local residents dedicated to restoring wildlife habitat and native vegetation. CWFF was largely responsible for the passage of a 2000 County mill levy that tripled the County’s weed management budget. Supplee says that the local media also has been very supportive of weed efforts in Missoula. Their support has been a terrific asset in terms of increasing public awareness and providing weed education. 

Future Challenges

Lange says the public authorized them to use herbicides only in developed areas such as campgrounds, along roads, and at trailheads. These were areas where plant communities were already altered. However, 40% of new infestations are in the backcountry and they are spreading. “This will be our big issue in the future,” he concludes.

Glacier’s Exotic Plant Threat

The flora of Glacier includes more than 132 species of exotic plants. A number of these species are increasing in quantity, area and density. This presents a problem for the perpetuation of native plant communities and

hence the quality of wildlife habitat in the park. It also impacts the quality of recreation and increases the potential for spread to lands outside the park. Scientific research and investigations since 1983 have documented the spread of several prohibited noxious weeds beyond developed areas into native plant communities, wild and scenic river corridors, and backcountry areas proposed as wilderness.

Noxious weeds impact approximately 1,277 acres within Glacier National Park. Fifteen species of mutual concern within the region are spotted knapweed (*Centaurea maculosa*), leafy spurge (*Euphorbia esula*), St.

See “Glacier National Park” on page 12

“Glacier National Park” Continued from page 11

Johnswort (*Hypericum perforatum*), sulfur cinquefoil (*Potentilla recta*), oxeye daisy (*Chrysanthemum leucanthemum*), meadow hawkweed (*Hieracium pratensis*), orange hawkweed (*Hieracium aurantiacum*), Canada thistle (*Cirsium arvense*), houndstongue (*Cynoglossum officinale*), Field bindweed (*Convolvulus arvensis*), Dalmation toadflax (*Linaria dalmatica*), Tall buttercup (*Ranunculus acris*), common tansy (*Tanacetum vulgare*), tansy ragwort (*Senecio jacobaea*), diffuse knapweed (*Centaurea diffusa*), and rush skeletonweed (*Chondrilla juncea*).

In general, knapweed occurs in dry areas along roadsides and in development zones where it is competitive and effectively displacing native vegetation. The adjacent communities are primarily fescue grasslands, spruce/fir forests, and lodgepole pine forests. Disturbance has been a major factor for

knapweed establishment. over time, knapweed becomes a monoculture resulting in loss of the native plant community.

Leafy spurge occurs primarily in the fescue grasslands of the North Fork valley. Leafy spurge represents the greatest threat to ecological integrity because it is persistent and once established, it is extremely difficult to eliminate. Present infestations are increasing along with their impact on the dry grasslands.

Scientific research and investigations since 1983 have documented the spread of exotic plants beyond developed areas into native plant communities, wild and scenic river corridors and backcountry areas proposed as wilderness. Especially vulnerable are the valued fescue grasslands. The longevity of weed seed in the soil is a significant problem requiring long-term control treatments. Significant construction projects have resulted in additional disturbance and increasing opportunities for spread. 

Need More Information?

Call TechLine at 1-800-554-WEED (9333)



This issue of *TechLine*TM newsletter details several successful management programs that progress despite early setbacks and obstacles. This issue relates the tactics and techniques employed by weed managers that “never gave up.”

More information from these articles and other resources mentioned in this issue may be obtained from *TechLine*TM newsletter by calling toll-free 1-800-554-9333.

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