J. Other Forest Monitoring Activities

The Forest routinely conducts a wide range of monitoring activities which are not directly linked to the Forest Plan. Examples of these monitoring activities, which we conduct to evaluate the effectiveness of resource program management and trends in the resources, are briefly described in this section.

Mountain Goat Telemetry Study

A mountain goat telemetry study was initiated in 2002 on the Cowlitz Valley Ranger District. A total of ten goats have been outfitted with radio collars containing GPS transmitters. The captures were performed by tranquilizing animals from helicopters, as well by stalking goats on foot. Three goats were captured in the Goat Rocks Wilderness in July, 2003, and the remaining goats were all captured in the Cispus Adaptive Management Area and nearby sites including three on Juniper and Languille Ridges in the Dark Divide Roadless Area.

There are several objectives for the study, including developing sightability index models that can be used to calibrate aerial surveys and provide more accurate estimates of population sizes. Also, habitat relationships data such as home and seasonal range use, movement patterns, and other information will be collected to allow better evaluation and planning of projects in mountain goat habitat. These data will be very useful for the next update of the GP Forest Plan. Intriguing location data has been collected about collared animal movements from summer to winter ranges, and the dispersal of two goats to new habitat areas several miles from their capture sites.

Tom Kogut Photo

Figure 40. - Mountain goats at the base of Jumbo Peak, August, 2003

Tom Kogut Photo

Figure 41. - WDFW veterinarian monitors the condition of a tranquilized mountain goat on Jumbo Peak

High Meadow Rehabilitation Project

In 2003 a project was initiated on the Cowlitz Valley Ranger District to rehabilitate high elevation, upland grassy meadows that are being encroached upon by conifers, mainly young lodgepole pine trees. These meadows provide uncommon and valuable habitat for many species, including the mardon skipper butterfly (a candidate for Federal listing under ESA) and populations of rare grapeferns. If left untreated, these meadows would gradually succeed to conifer forest, and cease to provide habitat for the dozens of plant and animal species that utilize them.

Following the completion of the NEPA analysis and a decision memo for the project, work was started in September on two meadows with the most severe encroachment problems. Approximately seven acres were cleared of small conifer trees using hand tools. The cut trees were stacked along the meadow edges to lessen visual impacts. Work will continue on these and other meadows in 2004, and long-term monitoring will continue to determine the extent to which mardon skipper and grapefern populations respond to the treatments.

Tom Kogut Photo

Figure 42 – USFWS biologists participating in the High Meadow Rehabilitation project

Tom Kogut Photo

Figure 43 – Meadow after encroaching lodgepoles removed.

Teachers in the Woods Monitoring Projects

Teachers in the Woods (TITW) is a summer program designed to give experienced middle and high school science teachers an opportunity to gain "real-world" field experience on forest lands. Funded by the National Science Foundation (NSF), *TITW* was established in 1995 by Dr. Marion Dresner through the Center for Science Education at Portland State University (PSU.) The Gifford Pinchot National Forest became a partner in 1997, hosting teachers as volunteers for each of the past seven summers. *TITW* begins with one week of intensive training for all forty participating Northwest teachers, followed by four weeks of field work. Following the summer field season, the teachers receive additional support as they implement student-driven science inquiry projects back at their schools. Following are reports from two of four monitoring activities conducted by the TITW program in 2003

Monitoring Avian Productivity and Survivorship

Introduction

Figure 13. - Forest Service biologist shares in a young student's excitement of holding a bird for the first time.

The Monitoring Avian Productivity and Survivorship (MAPS) program was started in 1989 by The Institute for Bird Populations (IBP) in Point Reyes Station, California. It is patterned after the British "Constant Effort Sites" method used by the British Trust for Ornithology. MAPS involves over 500 constant–effort mist netting and banding stations throughout the United States and Canada during breeding season. It is a cooperative effort between several public agencies, private organizations, and individuals throughout North America.

Objective

There are several objectives of the MAPS study:

1. Apply a nationally recognized protocol that assesses breeding bird productivity and survivorship over time and across landscapes and habitats.
2. Identify the causes of population declines and recommend strategies for reversing these trends.
3. Become more familiar with their life histories so that management actions may promote positive changes to birds and their habitats.
4. Educate
5. Understand on a local level which birds breed and winter in riparian hardwood forests.
6. Identify local conditions that may affect breeding and wintering success.

The MAPS site the teachers helped with in 2003 is at St. Cloud Recreation Area on the Gifford Pinchot National Forest. It is administered by the Columbia River Gorge National Scenic Area, and is located about seven miles west of Beacon Rock on the Washington side of the river. MAPS survey data began at this site in 1997. The area is a small wayside stop at river level that includes an old orchard, and an adjacent hardwood forest and riparian area. The study area where the nets are set up is a closed-canopy bottomland hardwood forest. Dominant tree species are Oregon ash, red alder, black cottonwood, and cascara. Other plants in the study area are Himalayan and native blackberries, stinging nettle, *salix* shrubs and trees, Pacific dogwood, ninebark, Douglas-fir, western redcedar, and one Oregon white oak. Jewelweed, a native herbaceous plant that creates a lush carpet in the bottomland riparian forest, also grows at the site.

Figure 16. A teacher removes an American Robin from the mist net under the watchful eye of a US Fish and Wildlife Service biologist.

Methods

Ten mist nets, in which to capture the birds for study, are put up on eight different days during specific ten–day periods between May 21 and August 8. Mist nets are 40 feet long and about nine feet tall. They are sectioned off into four horizontal portions by five nylon guy lines. These sections provide a pocket area when the net is stretched between two long poles and allowed to have some sag between sections. The nets are made of very thin, black threads, so they are difficult to see, especially in shady areas.

Each of the nets is set in the same place each day of the study to provide consistency. The St. Cloud site has been studied since 1997 using the same net sites, with the exception of two that had to be moved in the '97 study due to flooding. The nets are checked every 40–50 minutes to retrieve the captured birds. When it is difficult to free the birds a small cut is made in the net to release them without harm.

. Once the freed from the net the species is identified, wings are measured, the bird sexed and aged, its brooding stage documented, and a band is put on the bird's leg. Great care is taken to not harm the bird. When all of this data and the bird's band number is recorded, the bird is set free.

The information is kept on separate data recording sheets depending on whether it is a newly banded bird, a recovery (a bird that had been banded at another station), a recapture (a bird that had been banded earlier the same year, at this same station), or a return (a bird that was banded in a previous year, at this same station). There is a separate sheet for each previous year.

A map of the area with locations of nets and vegetation types is created. MAPS station operators are also required to record the probable breeding status of all avian species seen and heard, as well as those captured, and to assign a composite breeding status for every species at the end of the season based on those records. MAPS operators are then able to submit their data to IBP by means of a specially designed computer program, which can then conduct more thorough statistical analysis on the compiled data.

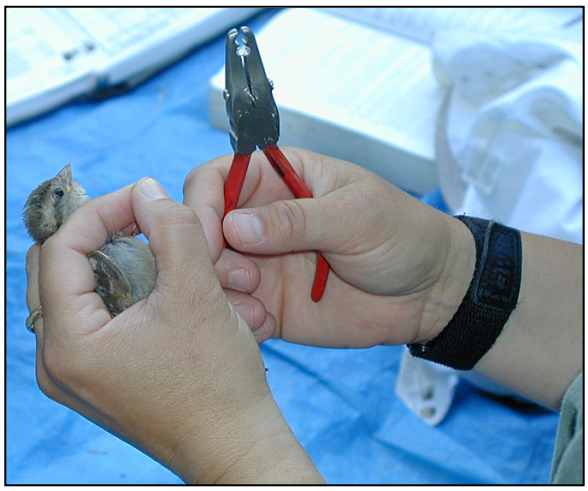

Figure 44. – A teacher preparing to band a juvenile house sparrow

Results

The July 9 study day that the teachers helped with was the 5th period for spring, 2003. There were three more study days through August 8, for a total of eight days, or 400 hours. The species identified were American Robin, Common Yellowthroat, Oregon Junco, Rufus Hummingbird, Song Sparrow, Spotted Towhee, and Swainson's Thrush.

Table 20, page 94, shows the species banded by year. In all seven years of data the song sparrow is the species most frequently banded (49 percent in 2003). The Swainson's thrush is the next most commonly banded at this site over the last six years (29 percent), but fewer birds, (17 percent) were recorded in 2003. New to the list in 2003 are an Oregon junco, purple finch, and winter wren. These three species are usually winter birds.

It would be interesting to examine if the species captured change very much from May to August. It also might be interesting to see if there were any major weather differences, water level changes, major changes in the birds' wintering climates, or other major events or changes in the area and structures around the site in the two highest precipitation years of 1997 and 2000.

Further study of capture records of each of the ten nets may disclose if any net consistently captures more birds, or more of a certain species, or more variety of species than other nets. Some nets are closer to the river, some closer to the road and/or railroad, some closer to the orchard edge, and some near the creek. Each with some variation in vegetation.

Finally, it would be interesting to find out if the number of people banding affects the bird counts in any way. It is possible that the presence of people in area may scare birds away.

Table 20. - Number of birds banded by year and species								
Species	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**Total**
	0	0	0	0	0	1	1	**2**
American Robin	19	5	10	7	10	9	16	**76**
Bewick's Wren	2	3	2	5	8	4	6	**30**
Black-capped Chickadee	4	10	5	4	2	2	3	**30**
Black-headed Grosbeak	0	6	1	3	0	1	1	**12**
Black-throated Gray Warbler	3	0	1	0	0	0	0	**4**
Brown-headed Cowbird	1	0	1	1	0	1	0	**4**
Chestnut-backed Chickadee	4	0	1	0	0	0	0	**5**
Common Yellowthroat	2	5	2	8	6	7	5	**35**
Downey Woodpecker	0	0	0	3	1	0	0	**4**
MacGillivray's Warbler	2	2	3	3	0	1	0	**11**
Orange-crowned Warbler	0	0	1	0	0	0	0	**1**
Oregon Junco	0	0	0	0	0	0	1	**1**
Purple Finch	0	0	0	0	0	0	1	**1**
Red-breasted Sapsucker	0	0	0	0	1	0	0	**1**
Red-eyed Vireo	4	1	0	1	4	0	1	**11**
Song Sparrow	33	31	34	54	29	19	66	**266**
Spotted Towhee	4	0	0	2	1	5	3	**15**
Steller's Jay	1	0	0	2	0	0	0	**3**
Swainson's Thrush	46	25	25	39	32	21	23	**211**
Varied Thrush	0	3	0	0	1	0	0	**4**
Warbling Vireo	0	1	1	3	0	0	0	**5**
Western (Pac-slope) Flycatcher	0	1	0	0	1	1	0	**3**
Western Tanager	0	0	0	0	1	1	0	**2**
Western Wood-pewee	1	0	0	1	0	0	2	**4**
Willow Flycatcher	0	1	5	2	2	1	2	**13**
Wilson's Warbler	0	7	6	1	3	2	0	**19**
Winter Wren	0	0	0	0	0	0	1	**1**
Yellow Warbler	1	0	0	0	0	2	2	**5**
TOTAL	**127**	**98**	**98**	**139**	**102**	**77**	**134**	***776***

Mardon Skipper Monitoring

Objective

The purpose of this project was to survey suitable habitat within the Ice Caves cattle allotment – on the Mount Adams Ranger District – for Mardon skipper butterflies and, if possible, to evaluate the impact of approximately 200 cow-calf pairs grazing on the meadows in these locations.

Figure 45. - Mardon skipper

Introduction

Polites mardon is a small, tawny, orange-brown butterfly with a distinct chevron-shape marking made up of rectangular patches between the veins on its wings. When sunning itself, the Mardon skipper generally lays its hind wings out flat and lifts its forewings at a 45-degree angle.

Mardon skippers lay eggs in grasses of the *Fescue* genus during a four-week period in late spring/early summer. Within a week the larvae hatch out. The caterpillars feed on the fescue grasses for about three months and cocoon there in winter. For the five to ten days of their adult life, they "skip" from site to site at low levels and feed on nectar of flowering plants, notably vetch, sego lily, and wallflower.

These butterflies are found in four disjunct areas– south Puget Sound, the southern Washington Cascades, the Siskiyou Mountains of southern Oregon, and the coastal region of northern California. In each of these locations they inhabit open prairie areas with a relatively high moisture content to support their favored bunch grasses. Only limited populations of Mardon skippers have been identified in these spots, just a few hundred in all.

The Mardon skipper has been recommended for listing as a Washington State endangered species. The Mardon skipper is subject to a number of threats to its grassland habitat: development, recreation, pesticides and herbicides, grazing, invasion of native and non-native plants, and fire suppression. The primary habitat for the Mardon skipper in western Washington, prairie grasslands, have been reduced to 5 percent of their original size over the past 150 years. In addition, the sites on which Mardons make their home are distant from one another, making recolonization difficult.

Methods

The Forest's database of vegetation types were used to identify potential Mardon skipper habitats. For this survey, sites identified in the database as "dry meadow" were examined. Some of the areas were the same areas where Mardon skippers had been documented in previous years. Sites were surveyed by having each surveyor walk transect lines that were spaced approximately fifteen feet apart. Multiple transects were surveyed until the entire meadow was covered. Walking slowly, each observer scanned the area within their transect area to detect skippers in flight from one plant to another or in their distinctive perching posture.

Figure 46. - Teachers walk Lost Meadow searching for the Mardon skipper butterfly.

Once a potential individual was identified, the Mardon species was verified by the chevron marking on the wing, and then gender was determined by the presence or absence of a stigma on the upper wing. Some of the Mardon skippers were identified by sight or with close-focus binoculars; others were captured in nets and temporarily transferred to insect-viewing jars for observation before being released.

No firm conclusions can be drawn from our data. Observations confirmed that there are Mardon skippers in Peterson Prairie and Cave Creek Meadow, as in previous years. However, at Peterson Prairie, over a 100 were counted in 2000, and over 180 in 2001. This year, only six skippers were identified.

Five Mardon skippers were identified at a new site, Lost Meadow. These were quite tattered, perhaps indicating they were at the end of their life cycle. It is possible there were more Mardons earlier in the season. Another new site was documented in an old timber harvest unit that contained a natural stand of fescue grass.

In all, only nineteen of the butterflies were observed. The lack of sightings at other locations and the limited sightings at these places could indicate a number of possibilities. It is possible that the early warm weather, and relatively light winter snow pack brought on an earlier adult season. The South Prairie sites may be inhospitable to Mardons due to apparent periodic flooding.

There was insufficient data to comment on the effect of cattle grazing. While the cows can trample the Mardon skippers and eat the larvae on the fescue grass, they may contribute to limiting invasive plant species. Hopefully, continued monitoring will provide better understanding of this issue.

!

Figure 47. - Butterfly crew tooled up and ready for action.

The Mining Reach of the Wind River Stream Channel and Riparian Rehabilitation Project

Introduction: The Mining Reach Riparian and Stream Channel Restoration Project is located in the Wind River watershed, a southwestern Washington tributary which enters the Columbia River at river mile 155, east of Stevenson. The Mining Reach Restoration project is part of a large scale multi-agency watershed restoration program to accelerate the recovery of watershed processes and threatened summer steelhead habitat. The US Forest Service, US Fish and Wildlife Service, Washington Department of Fish and Wildlife, USGS Biological Resource Division, Bonneville Power Administration and Underwood Conservation District have made significant progress in restoring hydraulic processes, rehabilitating critical habitat and monitoring the populations. Since 1992, approximately 100 miles of road have been stabilized or "storm-proofed", 35 miles have been decommissioned, 120 acres of flood plain have been reclaimed, 300 riparian acres have been planted and 3,000 pieces of large wood have been placed back in 8 river miles of stream. In addition, the USFWS and UCD have initiated restoration on private lands with the implementation of two "demonstration" projects.

The Forest received the American Fisheries Society, Western Division 2004 Award for Excellence in Riparian Management for our efforts in restoration of the Mining Reach.

Photo Brian Bair

Figure 48. - Mining Reach of the Wind River river mile ~24.3.

The Mining Reach project area was railroad logged from the late 1920's through the mid 1930's. The removal of old growth riparian vegetation and in-stream large woody debris, combined with road building and regeneration harvest in the upper watershed, severely impacted this reach. Reference data, collected in a relatively undisturbed reach above the project area, was used to develop quantitative objectives and restoration templates.

Three river miles of steelhead spawning and rearing habitat within the Mining Reach were treated in 1999-2000. Approximately 80 acres of riparian stands adjacent to the project area were thinned to increase stand vigor and diversity, as well as provide a source of in-stream structural material. 1,700 full length trees (~500 with intact rootwads) generated by the thinning were used to treat seventy-nine sites within the stream channel and flood plain. Large woody debris structures were used to protect riparian vegetation, reduce width/depth ratios, increase bank/channel stability and reconnect flood plains. Subsequent to the in-stream and riparian restoration phase, over 260 riparian acres were under planted with 43,000 native conifers.

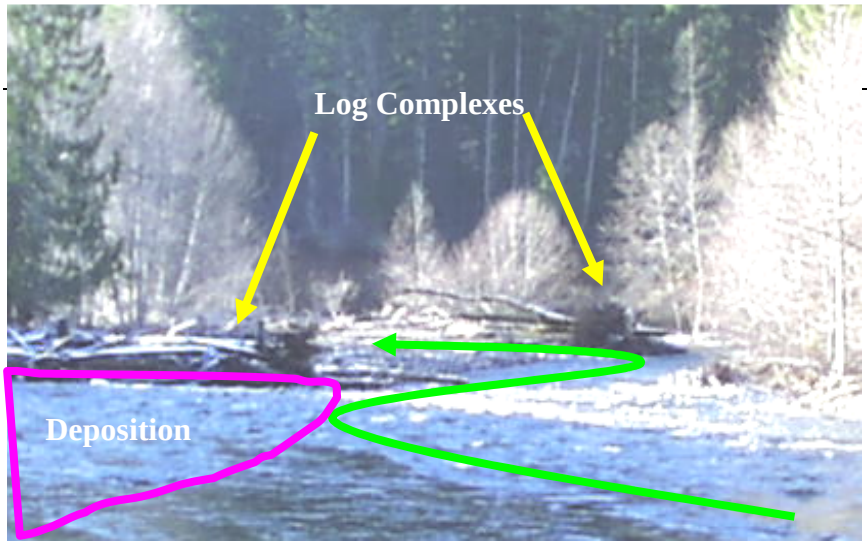

Photo Brian Bair

Figure 49. – Log Complexes
This photo is taken in the same location as Figure 48 to demonstrate how log complexes were installed to reconstruct meanders, restore sinuosity, lateral stability, width-to-depth ratios and restore historic belt width. These structures also scour pools and provide hiding cover for adult and juvenile steelhead.

Monitoring:
Approximately 750 meters of channel were evaluated against quantitative objectives derived from reference conditions to evaluate the project.

Objectives and Results:

(1) Restore the riparian conifer component along these reaches to 50-80 trees per acre greater than 31" in diameter (200 years) and

(2) Increase shade to greater than 70 percent.

Approximately 80 acres were thinned and under planted with 43,000 western red cedar and grand fir. Fourteen survival and growth plots have been established. These are long-term objectives that will take decades to achieve. Monitoring and maintenance of planted trees will play a critical role in meeting objectives.

(3) Increase bank stability above 80 percent (10 years).

Bank stability in the evaluated reach was increased from 33 to 91 percent.

(4) Reduce bank full width-to-depth ratios within identified reaches to less than 25 (2 years).

Bank full width-to-depth ratios decreased by 40 percent, from an average of 87 to 51 and low flow width/depth ratios decreased 56 percent. This still falls short of our bank full objective of 25 but we expect a continued decrease of width-to-depth ratios as structures accumulate fines and scour pools. As an indication of trends heading in the right direction, pool volume increased by 520 percent!

(5) Increase in-stream large woody debris >200 pieces per river mile, >12” in diameter, >60’ in length (70 years).

Large wood was increased from 46 pieces per mile to 294 pieces per mile as a result of treatment.

(6) Restore 32 acres of historic flood plains. Seventy-eight acres of historic flood plains were reactivated by aggrading stream bed elevations 3-7 feet with large log jams.

Photo Brian Bair

Figure 50. - Lack of lateral stability promotes meander "cut-off" such as the one shown above. When the channel loses sinuosity, the channel slope and pool spacing increase, stream bed degrades. The channel becomes incised. and drops out of the flood plain. Severe bank erosion ensues as the stream creates a new flood plain.

Photo Brian Bair

Figure 51. – Log jams were installed as natural grade controls to aggrade the channel, restore sinuosity, flood plain connectivity, and bank and channel stability.

Photo Brian Bair

Figure 52. - Mass wasting from banks such as these can introduce very large quantities of coarse and fine sediment to spawning substrate in the reaches below. (Wind River, mile ~24.0)

Photo Brian Bair

Figure 53. - Log "terrace toes" were constructed at the bank-full elevation to prevent undermining of the slope and reduce delivery of coarse and fine sediments.