Dixie National Forest

Monitoring Report for Fiscal Year 2004

Introduction

The purpose of this summary is to provide forest managers and the public with a brief look at the monitoring accomplished during fiscal year 2004 as part of implementing the Dixie National Forest Land and Resource Management Plan (forest plan). This report does not discuss individual management projects. Instead, it gives an overview, for fiscal year 2004 and by subject area, of specific monitoring items prescribed in the forest plan. More information is available at the Dixie National Forest headquarters in Cedar City, Utah.

Developed Recreation

Conditions and Services of Developed Sites

In 2004 little was done to improve facilities and reduce deferred maintenance needs on developed recreation sites. Due to low funding, the only deferred maintenance accomplished in 2004 was handrail improvement on the stairs at Wildlife Point at Panguitch Lake. If actions are not taken to correct deferred maintenance problems, some facilities will become unusable.

Fourteen of twenty-four campgrounds or group areas on the Dixie National Forest are currently on the National Forest Reservation System under contract. All developed sites on the forest are used heavily on weekends and some are used heavily during the week as well, but less frequently than weekends. Some individual sites in the more popular campgrounds were full 100% of the time on weekends.

Using reservation system contract data, some developed campsites had heavy use—60% overall use on some, and up to 100% weekend use. These levels of use may indicate potential resource or facility damage. We are evaluating ways to avoid this resource damage. One way would be to first compare heavily used sites that are listed on the reservation system with similar (lesser used) sites not on the system. The next step could be to put the lesser-used sites on the system, thereby evening out the use and reducing resource damage.

Skiing

In the 2003-2004 season, approximately 130,000 skiers used the Brian Head ski area. The area's capacity is approximately 493,000, well above the present use level. Snow conditions for the past five years have been poor; therefore, actual use may not be a suitable indicator of potential use.

Figure 1. *Fishing is a popular recreational opportunity offered on the Dixie.*

Dispersed Recreation

Trail Use

There was a forest-wide increase in use of heavily traveled trails (more than 10 people per day), and a slight decrease in lesser-used trails (less than 10 people per day). Most high-use trails are scenic and open to mechanized travel.

Additional yearly monitoring is needed to create baseline data, as the forest has monitored trail data for only two years. We expect trail use to increase because the forest is close to Las Vegas, and fast-growing St. George. Also, the forest provides many opportunities for motorized recreation, a rapidly growing sport.

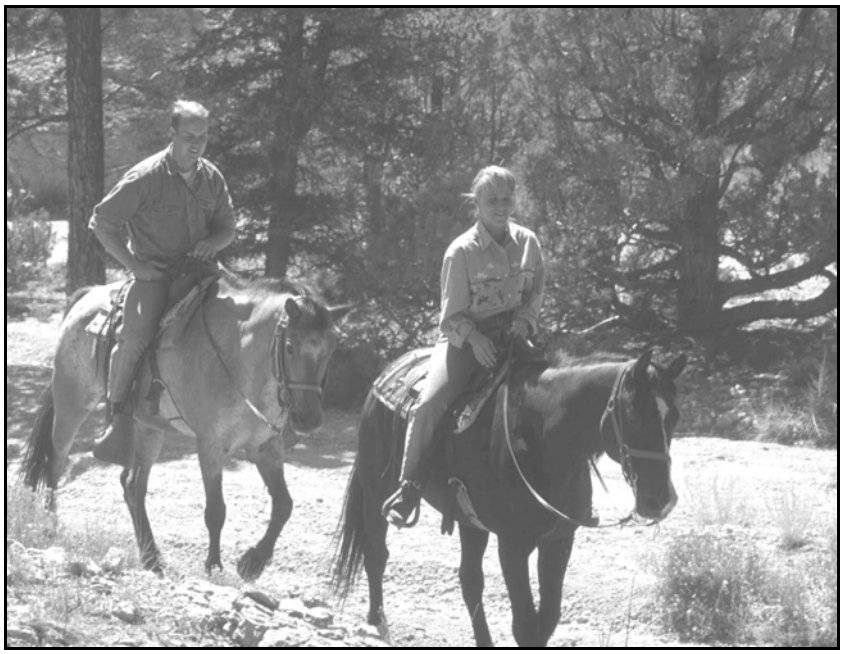

Figure 2. *The Dixie offers many trails for horseback, foot, and mountain bike travel.*

Trail Conditions

The Dixie inventoried about 15% of its trails, and found over 80% of them to be substandard. This is based on the TRACS system, the Forest Service Intermountain Region's protocol for trail condition monitoring. There are presently insufficient funds to correct most of the problems.

Wilderness

In 2001, the Dixie implemented a campsite monitoring program. It was an initial inventory and survey of campsite conditions as part of an overall *limits of acceptable change* (LAC) management framework. The forest is in the process of instituting management plans for the wilderness areas that establish indicators and standards based on the baseline data collected in 2001. These indicators and standards, as part of the LAC process, will allow the forest to monitor wilderness resources and ensure that human use does not compromise the integrity of wilderness values.

Figure 3. *Scenic views such as this one near Box Death Hollow Wilderness are abundant on the forest.*

Heritage (Cultural) Resources

Federal law requires us to conduct surveys for historical and archeological resources prior to ground-disturbing activities. We surveyed 32 projects totaling approximately 2,000 acres, and found 71 archeological and historical sites. Of these sites, only 10 were found not to be eligible for the National Register of Historic Places. All historic properties were avoided in all project activities, and the forest met all the requirements in the law regarding cultural resources.

Figure 4. *Sierra Club volunteers perform archeological survey work.*

Wildlife

Management Indicator Species

Northern Goshawk

The forest monitored 120 of 130 existing goshawk territories and found that 42 were occupied and 34 were confirmed active. An active nest is one where the adults have incubated eggs and may or may not have successfully produced young. The number of active nests increased from three in 2002 and ten in 2003. It is believed that drought conditions that prevailed for five years through 2003 were responsible for the low number of active nests. Increased precipitation in 2004 across the forest was likely responsible for increasing population numbers and distribution of many wildlife species, including goshawks.

In 2004, two timber sale projects were reviewed for implementation of mitigation measures for the northern goshawk. Results indicate that the mitigations were implemented and that connective corridors for movement of goshawks and other wildlife species were also maintained.

The presence of snags (standing dead trees) is also important to goshawk habitat. Snag numbers were monitored in two timber sale areas; one in ponderosa pine and one in Engelmann spruce. The snag

numbers in the ponderosa pine sale were below the forest plan standard of 200 per 100 acres. This is attributed primarily to unauthorized fuelwood gathering. Snag numbers in the Engelmann spruce sale area exceed the standard of 300 per 100 acres. This is due to the high abundance of dead spruce across the entire spruce zone on the Dixie National Forest.

Down logs and woody debris were monitored in one timber sale area within a spruce-fir vegetation type. Results indicate that the tons per acre of woody debris and numbers of down logs are being managed in adequate densities. These data are representative of most spruce and mixed species stands across the forest.

No goshawk territories on the forest have been identified as being threatened by livestock grazing, therefore, no "at risk" areas have been delineated.

Figure 5. *To survey for goshawks, a biological technician plays a goshawk call using a cassette tape and listens for a response.*

Northern ("Common") Flicker

The forest surveyed for northern flickers on 447 stations along 110 line transects (sample areas). A total of 329 flickers were detected on 89 of these transects. The same areas were surveyed in 2003 plus two other transects totaling 454 call stations. There were 43 more flickers detected in 2004 than in 2003, resulting in a slightly higher number of birds detected per calling station in 2004 when compared to 2003.

As is the case with goshawks, flicker population numbers were probably influenced by precipitation.

Mexican Spotted Owl

The 2003 USFWS survey protocol was used to survey for Mexican spotted owls. Calling surveys are generally conducted between 9:00pm and 1:00am. No spotted owls were detected in 2004. Additional personnel and equipment is needed to survey the amount of habitat necessary to validate all of the potential areas.

Wild Turkey

The Division manages wild turkey populations across the Forest. Over the Forest, the populations on the Dixie have increased. The Division was able to increase tag sales and have transplanted individuals from the Dixie to other areas.

Rocky Mountain Elk

Elk populations have increased in five of the six management units. The animal numbers remained the same in the Pine Valley Unit. For the six management units, three have herd numbers higher than objective, two have numbers at objective, and one is managed below objective. Elk are well distributed across the Forest and viable. Numbers are growing where the Division allows them to expand. The Division will continue to manage elk across the Forest using hunting as the primary tool to maintain population numbers at objective.

Mule Deer

Deer populations have increased in all six management units. Deer will continue to expand across the Forest where the Division will allow them to and will remain viable in all herd units. The Division will continue to manage deer at population objectives and use hunting as a management tool to control population numbers.

Habitat Effectiveness for Big Game Species

The density of open roads and motorized trails on the Dixie is 1.66 miles per square mile. This is less than the maximum 2.0 miles per square mile guideline in the forest plan. Open-road densities above 2.0 decrease habitat effectiveness for big game.

Arizona Willow

The condition of known Arizona willow was monitored in 2004. Overall, Arizona willow appears to have greater vigor than the previous year. Sufficient funds and resources were available to achieve the monitoring objectives.

Fisheries

Resident Trout (brook, brown, rainbow, and cutthroat)

Based on a survey of 15 streams across the national forest, most streams currently support healthy fish populations. Population trends are unavailable because we are still gathering baseline data.

Fish and Riparian Habitat

The Sanford Fire heavily impacted Cottonwood, Deep, and Deer Creeks and their watersheds in 2002. All three streams were surveyed in 2004; results showed the streams and surrounding riparian habitats are slowly recovering from the fire. However, overall fish habitat condition in these streams is still very poor, and the streams are currently unable to support coldwater fish populations. The forest has chosen to let the streams recover without treatments, and will continue to monitor their condition annually.

Bonneville Cutthroat Trout

A Bonneville cutthroat trout population and its habitat were also severely degraded by the Sanford Fire of 2002 (see above). The forest surveyed a section of Deep Creek on the Powell Ranger District (a Bonneville Cutthroat Stream) in 2004, and found that the stream and its surrounding riparian habitat are slowly recovering from the fire. However, overall fish habitat condition in Deep Creek is still very poor, and the stream is currently unable to support a population of Bonneville cutthroat trout.

***Figure 6**. Biological technicians survey fish populations using the electroshock method, which temporarily stuns the fish and allows them to be gathered in a net. Data are gathered before the fish are released back into the stream.*

Timber

Growth and Supply

In the forest plan, which was finalized in 1986, thinning of timber stands was intended to promote wood growth. Since the plan was written, emphasis has shifted to ecosystem health rather than growth for production.

Thinning and reforestation to date have not met the projections in the forest plan. This is due to the decline in the timber harvest program and the accomplishment of most thinning early in the monitoring period. We expect reforestation activities, quantities, and plans to continue in conjunction with spruce bark beetle recovery projects.

Most timber areas that were harvested prior to 1986 (when the forest plan was adopted) have regenerated to an adequate restocking level. In the areas that have not, we will continue work and evaluation toward adequate levels. 802 acres were certified as adequately restocked in 2004; pine and Douglas-fir survival rates were poor, but

Engelmann spruce rates were excellent. The pine and Douglas-fir areas will be replanted.

On the Dixie, there are approximately 268,000 acres suitable for timber production; this is spread out among the Cedar City, Escalante, Powell, and Teasdale ranger districts. In 2004, 2,266 acres of timber harvest were sold and 144 acres were harvested. The amount of sawtimber (wood suitable for lumber production) in areas not specifically reserved for other activities (e.g., campsites), is approximately 1,200,000 MCF (thousand cubic feet) or approximately 4 billion board feet. The annual growth is approximately 15,000 MCF and annual mortality approximately 19,000 MCF.

Although localized fuelwood shortages may occur—primarily in the St. George area—the fuelwood supply appears to be able to meet the projected demand during the next five years. In the past ten years, the forest has experienced catastrophic Engelmann spruce tree mortality due to a spruce bark beetle epidemic. This has contributed to an increased amount of fuelwood.

Impacts of Management Activities

114 acres were clear-cut during 2004 to meet disease control objectives. There have been no adverse effects to harvest practices, visual quality, or other resource values due to the size or location of the clear-cut.

Mitigations are modifications to project plans to protect a resource. Mitigations to protect visual quality standards are being satisfactorily implemented on the ground. However, the forest needs to document the results of the monitoring annually.

We reviewed silvicultural prescriptions (detailed implementation plans) and found that existing timber sale contract provisions, when fully implemented with a map, adequately protect and maintain riparian areas in their existing condition.

Figure 7. *Timber harvest is one of the tools used to manage the vegetation on the forest. Income from timber sales provides revenue for local economies.*

Soil and Water

Water Quality and Riparian Areas

Water was sampled in eight sites across the forest; the Dixie was in compliance with state water quality standards for all parameters 100 per cent of the time, except for phosphorus and water temperature. Samples exceeded phosphorus standards approximately 67 per cent of the time, and water temperature standards approximately 12 per cent of the time. Some streams may not have the capability to meet water quality standards for phosphorus due to the nature of the native geology, which may also influence phosphorus levels. All streams that had high water temperatures suffer from loss in riparian vegetation that would normally provide stream shading.

Fifteen sites were monitored for accomplishment of riparian-area management goals, using techniques such as pebble counts, cross-sections, and photo points (comparison of photographs taken recently to those taken a specified time ago). No conclusions as to trends are possible because we are still establishing baseline data.

Two sites on the East Fork of the Sevier River drainage were monitored for bank stability. Impoundments and control structures in these streams have slowed any significant erosion, and vegetation is stabilizing the channel bottoms and banks.

Soil Monitoring

Coarse, woody debris was monitored on every ranger district within the ponderosa pine ecosystem to better understand if we are meeting a target of 5-10 tons of woody debris for maintenance of nutrient and moisture supplies of soils. Results show that the forest meets these objectives.

Monitoring of upland areas adjacent to riparian areas after timber sales showed that we have concerns related to logs left in a stream channel (causing high-flow damage to the banks), and visible vehicle tracks that are noticeable in the meadow.

Soil-compaction monitoring on two timber sales confirmed that compaction did occur during skidding operations (hauling the logs from the harvest site), but that the compaction was well within soil quality guidelines listed within the Intermountain Region Soil Management Handbook.

Three former fire sites were monitored for long-term soil productivity. Results showed that two exceeded soil-loss tolerances; this is typical in the short term (two to five years) until vegetative cover regenerates sufficiently. Further evaluation is needed to determine when erosion rates stabilize.

Twenty-one watershed improvement projects were monitored to determine effectiveness and maintenance needs. Typical projects were willow plantings, grazing exclosures, and bank stabilization. Seventeen projects were initially successful in moving towards the desired future condition, and four projects will need further evaluation relating to the success of willow planting and bank stabilization treatments. The forest uses best management practices (BMPs) to meet water quality objectives and goals. In monitoring the effectiveness of these BMPs, we inspected drainage and erosion-control measures on five projects: three timber sales and two prescribed fires. We found that in the timber sales, skidding (removal) of logs on dry soil did not lead to long-term erosion; hand-removal of limbs, tree removal, and hand-piling during construction of fuel breaks did not result in additional detrimental disturbances; and logs from a timber sale left in a stream channel caused damage to the banks. Results for the prescribed fires were that the formation of rills and soil displacement can occur on slopes greater than 30 percent.

Items Not Monitored This Year

No soil survey data was collected this year. Also, monitoring for water yield increases in the East Fork of the Sevier Watershed has been dropped.

Figure 8. *Moody Wash showing impacts to a riparian area from a pipeline installation (above), and rehabilitation (below) following a successful willow planting.*

Identification of Future Needs

Forest hydrologists are listing watershed improvement needs in a database to better understand the backlog of the watershed improvement projects.

Range

Forage Use

Range allotments as a whole appear to have been kept within allowable use levels in 2004. This is a positive relationship relating to the desired conditions of these allotments. If this continues, it is likely that the trend will continue to move in a favorable direction. Use on some riparian areas exceeded standards by at least 20%; measures and projects to address these overuse problems are in progress. Upland vegetation is generally under-used by livestock, although some allotments continue to experience heavy grazing in localized upland and riparian areas. The actual livestock use on the forest was less than the amount permitted. This is due to a variety of factors, including drought recovery, and reflects the grazing permittees' willingness to be flexible in order to maintain and improve range conditions.

Vegetation and Trend

Of the 2004 data that is usable for assessing trends in vegetation composition and soil cover, nine of the fourteen study sites showed downward trends in composition and soil cover. These nine sites represent variation from the Dixie Forest Plan monitoring and evaluation program, and need further evaluation or a change in management direction. These sites are located on the Pine Valley and Teasdale Ranger Districts. Five of the fourteen study sites show stable or upward vegetation and soil trends. These five sites do not represent variation from the Dixie Forest Plan monitoring and evaluation program.

Figure 9. *An exclosure is one method of measuring forage use. It prevents cattle from grazing in the excluded area, enabling range specialists to compare grazed and non-grazed vegetation.*

Minerals

No new proposals for exploration or development of locatable minerals occurred. This low level of activity is expected to continue on the forest because of limited mineralization and demand.

The number of mineral material permits issued in 2004 remained relatively high at 55. Almost all permits are for material in existing gravel and cinder pits that have been in use for 30 to 40 years. Some, but not all, pits have operating plans, but the plans are 20 or more years old and need review and revision. Emphasis needs to be given to pit plan revision on the national forest.

Leasable operations consist of three capped carbon dioxide wells and the Upper Valley oil field on the Escalante Ranger District; both are in compliance with surface use plans for those leases. There is oil and gas industry interest in new leasing, but no activity will occur until a forest-wide leasing analysis has been completed, at the earliest by 2006 or 2007. Oil and gas leasing activity is expected to resume and may achieve previously high levels encountered in the 1970s and 1980s, once the forest-wide oil and gas leasing analysis is completed.

Facilities

Roads and Bridges

The forest completed the following roadwork during 2004 through contract or Forest Service crews:

Miles of system road constructed 0.7

Miles of system road reconstructed..... 15.5

Miles of timber roads reconstructed 7.1

Total 23.3

The forest also performed maintenance on 23 percent of its system roads, and decommissioned 32.1 miles of existing roadway. Condition surveys are performed on a five-year rotation (20 percent of all roads are surveyed per year). In 2004, all of the maintenance level 3, 4, and 5 roads (those suitable for travel by passenger car), were surveyed. 81 percent of all forest system roads met established road management objectives as of October 1st, 2004. All bridges were inspected in 2004.

Buildings

Buildings that are in use and necessary for forest operations are maintained to a reasonable standard. Buildings that are abandoned or receive low use are not. If this trend continues, unused buildings will continue to deteriorate until they will have to be renovated or demolished. This is in accordance with the facilities master plan, which calls for most unused buildings to be disposed of.

Dams

All high-hazard dams were inspected by the State of Utah in coordination with forest engineering personnel. All inspections were done according to established state and federal regulations. Forest-owned dams continue to be under funded, and in need of heavy maintenance or reconstruction.

Public Drinking Water

All systems were monitored monthly for bacteria, in accordance with potable drinking water regulations and agency guidelines. Additional tests for nitrates are performed yearly, and for sulfates approximately every seven years.

All nitrate and sulfate monitoring returned acceptable results. Some positive bacterial samples were detected, but with follow-up testing all systems showed acceptable test results for bacterial water quality, and have approved status with the state.

Protection—Fire

In 2004, there were 182 fires on the Dixie—171 caused by lightning, and 11 caused by humans—for a total of 41,130 acres burned, excluding prescribed fire. The largest single fire was the Hawkins fire, located primarily on the Pine Valley Ranger District. The Dixie cooperated with the National Park Service, Bureau of Land Management, and Utah Department of Forestry to suppress these fires. Of these fires, about 9,900 acres that were naturally ignited were allowed to burn, to regenerate the vegetation.

The forest used prescribed burns to reduce fuel loading (buildup of excess flammable materials) on about 4,700 acres, of which about 4,200 acres were on wildland-urban interface (WUI) lands. We also used mechanical means (various methods of cutting) to reduce fuel-loading on about 2,000 acres of WUI lands.

Figure 10. *A firefighter ignites piles of woody debris called "slash", to prepare the site for tree planting.*

Insects and diseases

Insects and diseases on the forest have increased overall in the past ten years.

Beetle Infestations

Sustained drought has contributed to conditions leading to pine beetle and spruce bark beetle infestations. Spruce bark beetle populations grew to epidemic proportions in the 1990's, and by 2004 most of the mature and over-mature Engelmann spruce on the Cedar City Ranger District and parts of the Powell Ranger District had been killed. In the early 2000's, the spruce beetle infestation developed to epidemic proportions on the Escalante and Teasdale Ranger Districts as well.

The pine bark beetle, along with limb rust and mistletoe, are slowly killing the over-mature ponderosa pine on the forest.

Recently, the Douglas-fir bark beetle and fir engraver beetle populations have been building and killing large areas of Douglas-fir and white fir trees across the forest.

The pinyon *Ips* beetle population has reached epidemic levels in some parts of the pinyon-juniper areas.

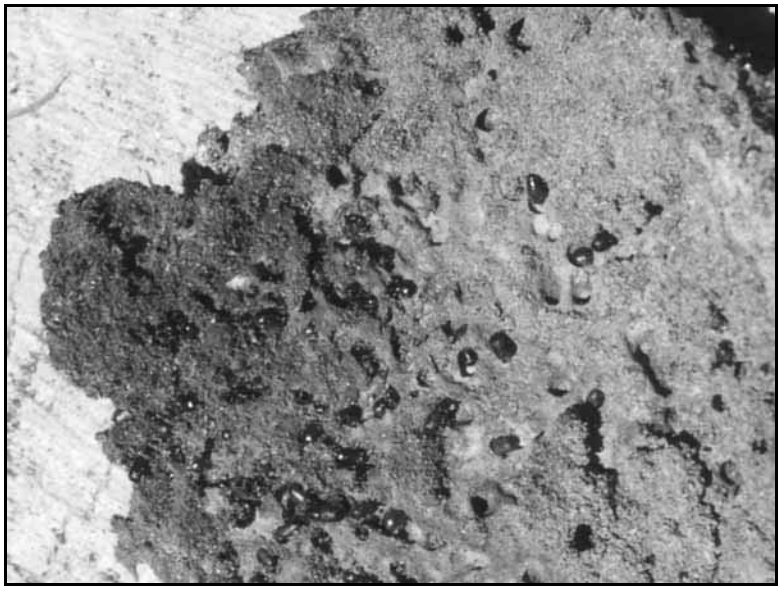

Figure 11. *Large numbers of bark beetles burrow under the tree's bark and lay eggs. The larvae consume the cambium (the life-support system for the tree) and essentially girdle and kill the tree.*

Dwarf Mistletoe and Root Rot

Root rot continues to be widespread across the forest, and treatment consists of clear-cutting or burning the affected area. Results of these treatments, and associated research, are pending.

Dwarf mistletoe is a parasite that is also widespread on the forest; treatment consists of harvesting the affected trees. Thousands of acres of trees infected with the parasite have been treated, and permanent growth plots have also been established to monitor its long-term effects on tree growth. Treatments have been successful in reducing localized dwarf mistletoe infections; however, the disease continues to be widespread in many stands. As new mistletoe areas are located, projects are developed to treat the infected trees.

In 2004, approximately 1,283 acres were treated for dwarf mistletoe control and no acres were treated for root rot.

Air Quality

All prescribed burning is implemented in compliance with the Utah Interagency Smoke Management Program. The Dixie National Forest submits an annual burn schedule to the Utah interagency smoke management coordinator.

There were no violations of state air quality standards. Public comments related to air quality on specific prescribed fires are noted at the district level and were reported at a "low" level for all prescribed fires on the forest.

The use of air quality monitoring equipment has led to increased data for the forest. This equipment did not record any readings in excess of the appropriate air quality standards in 2004.

Figure 12. *Air quality directly affects the quality of the experience in wilderness and other recreational areas.*