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Dixie National Forest

Five Year Land Resource Management Plan Monitoring Report for Fiscal Year 2006-2010



Garfield, Iron, Kane, Piute, and Washington Counties, Utah

Cover Photo – 2010 photo of South Fork Pinto Creek on the Pine Valley Ranger District. This area had forest road 30011 removed from the floodplain in 2006.

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Introduction

The purpose of this report is to provide Forest managers and the public with a brief look at the monitoring accomplished during last five fiscal years (2006-2010) as part of implementing the Dixie National Forest Land and Resource Management Plan (Forest Plan). It includes:

1. The assessment of the usefulness of forest plan monitoring items.
2. Determining changes to management direction to desired conditions and standards and guidelines.
3. Determining changes to monitoring activities.

This report does not discuss individual management projects; instead, it gives an overview of specific monitoring items prescribed in the Forest Plan. More information on specific projects is available from the Dixie National Forest, 1789 North Wedgewood Lane, Cedar City, Utah, 84721.

Air Quality

Compliance with Utah State Air Quality Guidelines and Standards

All prescribed burning was implemented in compliance with the Utah Interagency Smoke Management Program. The Forest has submitted an annual burn schedule to the Utah Interagency Smoke Management Coordinator as required. Permission to emit smoke was given before each prescribed burn was ignited. During the last five years (2006-2010), the Dixie National Forest fire managers have complied with state air quality standards, with no violations for significantly contributing to particulate matter. Public complaints were monitored by local ranger districts and reported to the Utah Interagency Smoke Management Coordinator.

Forest fire managers also kept the local communities and the Utah Interagency Smoke Management Coordinator and State Division of Air Quality informed of smoke production and dispersal during wildfire events across the Forest.

Cultural (Heritage) Resources

Completion of Cultural Resource Investigations For All Site-disturbing Activities Where No Site Inventory Has Been Completed

Federal Law requires the Forest Service to conduct surveys for Historical and Archaeological Resources prior to all ground-disturbing projects. During the last five years we surveyed or evaluated 132 projects totaling approximately 25,150 acres. During these surveys we found 815 archaeological and historic sites; of these only 168 were found not to be eligible for the National Register of Historic Properties. An increase in acreage and site numbers was seen last year due to the Forest receiving funding through ARPPA for a large ground survey in preparation for a large scale restoration project. Also two large surveys were conducted on the Forest for a Power line and a Gas Pipeline. All historic properties identified were avoided by all project activities. The Forest has met all the requirements in the law regarding cultural resources.

Summary of Cultural Resource Investigations from 2006 to 2010

Fiscal Year	Projects Surveyed	Acres Surveyed	Archaeological and Historical Sites Found	Sites found not to be eligible for the National Register of Historic Properties
2006	36	2,400	48	8
2007	15	1,500	48	8
2008	25	2,500	30	7
2009	29	3,200	42	10
2010	27	15,550	647	135
Total	132	25,150	815	168

Developed Recreation

Condition of Facilities

Condition surveys have now been completed for all developed recreation sites on the Dixie National Forest and entered into corporate database systems. Most deferred maintenance issues that have been identified are not being addressed because of budget constraints.

Facility Capacity and Developed Site Service

The demand for developed campgrounds is not exceeding supply. 2010 persons at one time (PAOT) days to standard reduction was due to Pine Valley Recreation Area being closed for reconstruction.

Fiscal Year	Daily Seasonal Capacity PAOT (Person at One Time) days	PAOT Days to Standard
2006	1,928,863	961,035
2007	1,928,997	952,195
2008	1,928,997	913,610
2009	1,928,948	913,413
2010	1,882,143	742,665

Developed Site Use – Amount & Distribution

The trend for the last 5 years has shown that large group sites exceed the available sites.

Downhill Ski Use

The five year average is not exceeding the demand by more than 20%. The use at Brianhead is slightly increasing over the last five years.

Fiscal Year	Brian Head Resort Skier Visits
2006	129,640
2007	135,602
2008	132,522
2009	128,750
2010	142,079

Dispersed Recreation

Dispersed Visitor Use (Summer and Winter)

Road and trail counters indicate both motorized and non-motorized visitor use has increased over the last five years. Motorized use has increase more significantly than non-motorized use. The forest has responded to the increase in motorized use through the implementation of the Motorized Travel Plan. Projects such as the Duck Creek ATV Trail improvements, Duck Creek ATV Trail Bridge, and the Jenson Sawmill ATV Crossing have focused on improving the trail tread, trail drainage features, water crossings, and relocating the trail away from water resources. In addition, the forest has published Motor Vehicle Use Maps, Travel Maps, and a number of OHV riding opportunities maps to educate the public about what routes are open to motorized use.

Site Conditions (Limits of change)

Dispersed camping is an increasingly popular use on the Dixie NF. Most dispersed camping on the forest is associated with motor vehicle and camp trailer use. The public's desire to camp near stream, lakes, and meadows, as well as the limited amount of these resources on the

forest has created the need for dispersed campsite management across the forest. The forest has implemented three designated dispersed campsite projects, three delineated dispersed campsite projects, and has restricted dispersed camping to within 150 feet of open system roads. Through the implementation of the Motorized Travel Plan the forest has also begun to restrict the expansion of campsites and has decommissioned sites on closed routes. The combination of camping restrictions, site decommissioning, and the increasing public demand for motorized dispersed camping has resulted in an increase of use and impacts to permissible campsites. On the contrary, the use of sites associated with non-motorized dispersed camping has remained stable and the impacts have declined.

Trail Condition

Trails requiring trail condition surveys are determined nationally based on a 2% random selection process. On average the Dixie NF performs trail condition surveys on two to three trails a year. Prior to the shift to a national 2% survey interval, the Dixie collected trail condition surveys on 20% of the trails. Data from trail condition survey and trail crew log books indicate that the most of the trails on the Dixie NF are in need of deferred maintenance. Many of these deferred maintenance tasks are major trail reroutes, trail tread reconstruction, and reconstruction of drainage features. Based on the current trails budget the forest is unable to perform these deferred maintenance tasks. The forest has been able to address some trail condition issues through successful State of Utah Motorized Trail grants, as well as other Forest Service funds such as Legacy Roads and Trails (CMLG) funds. The forest has removed four trails from the trail system over the last five years. Generally these trails lacked maintenance and had become overgrown or washed out making them inaccessible or difficult to follow.

Economics

Effects on Local Economies of Forest Outputs

Since the development of the 1986 forest plan, many traditional sources of income, such as natural-resource extraction, have diminished in their percentage of overall economic output. This shift is due to a general growth of the state economy, and not necessarily to a shrinking of these traditional economic activities. More recently, due to downturns in the real estate market, many jobs in the construction industry have been lost in local economies in southwestern Utah. Professional business, education, and health services are projected to grow; this is part of a larger trend in the western U.S.

Generally, economies that are more diverse and balanced (e.g., such as those seen in the larger counties (Washington and Iron)) are more resilient to change and fluctuation than economies that are less diverse and more heavily weighted to certain sectors. Most forest management decisions do not significantly impact our local county economies directly.

The forest is located in five counties: Garfield, Iron, Kane, Washington, and Wayne. Following is a summary of the changes in economic sectors, by county.

Garfield County

Slow job growth and unemployment are recurrent problems for the county. Traditionally, county residents have relied primarily upon ranching and timber. While there is a desire to retain these traditional sources of economic opportunity, services related to recreation and tourism are

growing quickly in the county. Services are projected to increase from a 30.1 percent share in the Garfield County economy in 2005 to a 37.8 percent share in 2030 (State of Utah 2003).

Iron County

Government is the largest sector of the Iron County economy, but the service sector is projected to grow the fastest through 2030. Services are projected to grow from a 21.6 percent share in the Iron County economy to a 25.5 percent share in 2030. Government jobs are projected to retain about a 21 percent share (State of Utah 2003). Overall, Iron County has a relatively balanced and broadly based economy.

Kane County

Kane County is projected to rely more heavily upon the service sector in the future. As in Garfield County, the leisure and hospitality sector provides the most jobs in the county, but the government sector makes the largest contribution to payroll wages.

Washington County

The trade, transportation, and utilities sector is currently the largest industry in Washington County. In the period from 1980 to 2002, as the economy grew (i.e., the service sector doubled) in other areas, many traditional industries (e.g., farming and ranching) saw their share of the county economy decrease. In fact, agriculture went from almost 5 percent of the economy to 1 percent. Between 2005 and 2030, government employment will likely remain the same and services will continue to grow, while natural resources and ranching will likely continue to be a small part of the economy. Health and education services are expected to grow to meet the demands of increased population. Overall, the economy of Washington County is very diverse and should be resilient to changes in the performance of individual economic sectors.

Wayne County

Education and health services are the largest sector in the Wayne County economy. Government is the second largest sector in the county. Since 1980, agriculture has decreased dramatically and services have increased. This is a trend that is projected to continue into 2030. In 1980, agriculture made up 26.9 percent of the economy, while services took only a 3.5 percent share. By 2002, agriculture had declined to 13.8 percent and services had increased to 24.9 percent. In 2030, agriculture is projected to occupy a 6.5 percent share, while services will have increased to 30.3 percent.

Facilities

Road and Bridge Construction and Reconstruction

Since the forest plan was written the emphasis has shifted to reconstructing existing roads. New road construction has declined significantly. This trend is expected to continue due to declining budgets.

Fiscal Year	Miles of Road Constructed	Miles of Road Reconstructed or Improved	Miles of Road Decommissioned	Bridges Constructed
2006	3.5	28.9	34.5	0
2007	0.3	14		2
2008	0	6.9		0
2009	0	17.2	26	0
2010	0	20.2	206.5	7
Total	3.8	87.2		9

Road Management

We have data for the past 3 years on sign inventory. In the years of 2008 and 2009 the sign crew installed and or checked 963 route markers. In 2010 the sign crew installed 95 route markers, 112 cattle-guards, 19 bridge weight limit signs, and 65 large and medium MTP signs. All condition surveys are done in accordance to protocols established by the regional office and the Washington Office. This protocol usually consists of a random sample of all forest service roads. Much of the monitoring focus on the Forest was in signing materials for level 2 – level 3 roads.

No random sample or road management was taken, but it is difficult to determine the trend in the condition of existing roads with a small random sample as it may or may not accurately represent the entire road system. A great focus point for roads is appropriate signing in conjunction with the forest's motorized travel planning effort.

Buildings

Fiscal Year	Buildings Inspected	Rated as Poor Condition	Rated as Fair Condition	Rated as Good Condition
2006	22	5	4	13
2007	18	7	4	7
2008	12	5	3	4
2009	21	8	5	8
2010	65	26	14	25

The average age of the buildings on the Forest is approximately 48 years old. Due to the age of many of the facilities and declining maintenance budgets the general trend in building condition is on a gradual decline. It is likely that this trend will continue and cause more buildings to be decommissioned. Implementation of a new facility master plan may provide direction for the forest in maintenance and decommissioning priorities.

Dam Administration

The following forest owned dams have been identified over the last five years to be in need of heavy maintenance and/or reconstruction.

- Pine Valley Reservoir
- Flat Lake
- Robs Reservoir
- Pine Creek Reservoir
- Posey Lake
- Navajo Lake Dike (Shared ownership with state DWR)

The regional dams engineer estimated the cost to rehab the Pine Valley Dam at \$360,000 and the state estimated the cost to rehab the Navajo Lake Dike at \$1,750,000. The effects of the Navajo Lake Dike breaching include the loss of a popular fishery, a reduction in the use of 3 campgrounds, a reduction in value of special use summer homes and a lodge and a reduction in tourism to Kane County. The effects of the lack of maintenance of the Pine Valley Dam include in hazard class from low to medium. This results in increased inspection frequency, state oversight and operations cost (additional paperwork and other requirements) as the hazard class on dams is elevated.

Fisheries

Fish and Riparian Habitat

Until 2010 Region 4 General Aquatic Wildlife Survey (R4 GAWS) was identified as the appropriate habitat monitoring system. This system was developed in the 1970s and the Forest Service Handbook containing it has subsequently been removed from the directive system. No R4 GAWS monitoring was completed on the Forest in the past 5 years and a 2010 Forest Plan amendment has removed all references to R4 GAWS from the Forest Plan.

Fine sediment deposition

Forest Plan Standards and Guidelines state that no more than 25% of stream substrate should be covered by inorganic sediment less than 3.2 mm in size (p. IV-33; percent fines). Since 2001 fisheries personnel have conducted 92 Wolman pebble counts (Table 1). The five year average percent fines for 2006-2010 was less than the Forest Plan standard of no more than 25% indicating that, Forest –wide, streams are in compliance with that standard. The average percent fines for the 49 pebble counts conducted between 2001-2005 was higher than the average percent fines calculated for the 43 pebble counts taken between 2006-2010 indicating that the trend on the Forest is stable or improving.

Of the completed Wolman pebble counts, 19 were conducted at individual sites during both the 2001-2005 and 2006-2010 time periods. Of these 19 sites, two declined from having a percent fine sediment less than 25 % in the last 2001-2005 sample to having a percent fine sediment greater than 25% in the most recent 2006-2010 samples, seven improved from having a percent fine sediment greater than 25 % in the last 2001-2005 sample to having a percent fine sediment less than 25% in the most recent 2006-2010 samples, and ten remained stable, with the percent fines either greater than or less than 25% during both time periods.

Table 1. Year, average percent of substrate covered by inorganic sediment less than 3.2 mm in Wolman pebble counts, and the number of pebble counts completed.

Year	Average % fines	Number of counts
2001	16	3
2002	27	17
2003	21	13
2004	23	11
2005	32	5
2001-2005	24	49
2006	23	12
2007	22	11
2008	na	0
2009	22	2
2010	18	18
2006-2010	21	43

Sensitive Fish Species

Bonneville cutthroat trout (BCT) (*Oncorhynchus clarki utah*)

The Forest Plan specifies that a 10% decline in any one population of BCT in one year will cause further evaluation and/or change in management direction (p. V-5). Utah Division of Wildlife Resources is the lead for BCT monitoring in the Utah's Southern Region. Previous monitoring efforts for BCT occurred in 2001-2002 and in 1995, prior to that. The most recent surveys were cooperatively conducted by UDWR and Forest personnel from 2008-2010. The 2008-2010 surveys showed some rather large fluctuations in BCT occupied habitat and standing crop on the Forest. While 4.8 miles of occupied habitat were added through the chemical renovation of Center Creek on the Escalante Ranger District from 2002-2004, the overall occupied habitat on the Forest declined by 35% compared to the maximum known occupied habitat for BCT conservation populations. Similarly, standing crop of BCT declined by more than 10% in 10 of the 15 streams where Bonneville cutthroat conservation populations currently occur on the Forest (Table 2). The average standing crop for all BCT populations combined declined by over 50% between the 2001-2002 and 2008-2010 sampling efforts.

For several of these populations (Leap Creek, Harmon Creek, Mill Creek, South Ash Creek and Deep Creek), the direct and indirect impacts of fire to stream habitat is the primary reason for this decline. In 2002 two large fires occurred on the Forest that affected streams with BCT Conservation populations: the Sequoia fire on the east side of the Pine Valley Mountains (Pine Valley Ranger District) and the Sanford fire on Mount Dutton (Powell Ranger District).

The Sequoia fire, along with the flooding and debris flows following it, effectively extirpated the BCT populations in Harmon, Mill and South Ash Creeks. Habitat in these streams was also severely degraded during the flooding, as stream channels incised to bedrock in some areas and large volumes of fine sediment were deposited in others. Since then BCT have been reintroduced to Mill Creek, Leap Creek, Harmon Creek, and South Ash Creek; however, another large flood and debris flow event in 2009 appears to have eliminated BCT from South Ash and Harmon Creek. A small section of Mill Creek still contained BCT, but abundance of fish was low. The reintroduction into Leap Creek in 2006 appears to have been unsuccessful, although fish may have established downstream of the 2010 monitoring areas. Additional monitoring of BCT expansion from Mill Creek and potential reintroductions into other streams affected by the Sequoia fire will occur over the next few years.

Similarly, the Sanford fire, along with flooding and debris flows following it, effectively extirpated the BCT population in Deep Creek. The stream channel incised and fine sediment deposition occurred following the fire. Prior to the complete extirpation of BCT in Deep Creek, 250-300 fish were moved to Tenmile Creek on the Fishlake National Forest. In 2005, 2006, 2008, and 2009 UDWR moved 40 to 50 Bonneville cutthroat trout back into Deep Creek from Tenmile Creek. As of 2009 the occupied distribution of BCT in Deep Creek on the Dixie National Forest was thought to be approximately 1.5 miles (of 3.6 originally occupied miles on the Forest) and fish are surviving, reproducing, and recruiting. In light of the potential for fire to eliminate the disjunct, peripheral populations of native cutthroat trout on the Forest, Fire Management Plans should be adjusted to contain direction to immediately suppress fires within a certain distance from native cutthroat streams and when a certain percentage of the watersheds containing these streams have been burned.

Table 2. Standing crop of current Bonneville cutthroat trout conservation populations in streams on the Dixie National Forest during monitoring in 2001-2002 and 2008-2010, along with the percent change between the two sampling periods. Streams with an “na” in 2001-2002 have been restored since that time.

Stream	2001-2002 standing crop (kg/ha)	2008-2010 standing crop (kg/ha)	Percent change
Reservoir Canyon	386	133	-66
Water Canyon	43	9	-79
Leap Creek	33	0	-100
South Ash Creek	106	0	-100
Harmon Creek	92	0	-100
Mill Creek	84	29	-65
Leeds Creek	66	48	-27
Spirit Creek	7	27	286
Horse Creek	16	21	31
Pig Creek	7	29	314

Threemile Creek	45	37	-18
Delong Creek	143	50	-65
Indian Hollow	66	19	-71
Deep Creek	69	42	-39
Center Creek	na	77	na
Ranch Creek	73	96	32
Average	82	39	-53

Ofentimes BCT have been reintroduced to, or have persisted in, streams with marginal habitat; therefore, occupied habitat varies annually with climatic conditions. Such is the case with Reservoir Canyon, Water Canyon, Delong Creek and Indian Hollow. While Reservoir Canyon and Water Canyon looks to have undergone a decline in standing crop between the 2001-2002 and 2008-2010 sampling periods, 2001-2002 standing crop values were artificially inflated because drought conditions had contracted fish habitat. When compared to the 1995 standing crop values in these streams, standing crop increased over 170% in Reservoir Canyon and 12% in Water Canyon. It appears that these two populations are stable. Standing crop for BCT in both Delong Creek and Indian Hollow was lower than both the 1995 and 2001-2002 estimate. These streams are tributaries to Threemile Creek which also saw a decline in standing crop. It is possible that these three streams saw populations contract during the extended drought periods in the late 1990s/early 2000s. Two culvert replacements were completed on Delong Creek in 2010 to facilitate fish passage. In addition several route improvements and restrictions are being considered within the drainage, which are designed to reduce sedimentation and improve trout spawning habitat.

As part of the Range-wide Conservation Agreement and Strategy for BCT, projects to increase and improve habitat for BCT are continually being planned and implemented throughout their range and within the southern geographic management unit. Sandy Creek (~ 5.5 miles) on the Cedar City Ranger District has had BCT reintroduced, but the success of the reintroduction has not been measured. Additionally, a nonnative trout removal effort in Deer Creek (~ 10.5 miles) on the Powell Ranger District should be completed in 2011 with BCT from the Deep Creek strain reintroduced by the end of the Fiscal Year. Cottonwood Creek (~ 10.1 miles) on the Powell Ranger District has also been identified for potential renovation and reintroduction (UDWR 2007). These and future habitat restoration and fish reintroduction projects should increase BCT abundance and occupied habitat on the Forest.

Colorado River cutthroat trout (CRCT) (*Oncorhynchus clarki pleuriticus*)

Utah Division of Wildlife Resources is also the lead for CRCT monitoring in Utah's Southern Region. Extensive survey efforts in the 1990s found that 5 remnant populations of CRCT occupied approximately 8.2 miles of stream in the Escalante River drainage on the Dixie National Forest (Water Canyon Creek, White Creek, West Branch Pine Creek, West Fork Boulder Creek, and East Fork Boulder Creek). Since that time an aggressive effort has been made to expand these remnant populations through nonnative trout removal and to create new populations through nonnative trout removal and/or CRCT reintroduction. As with BCT, CRCT are often found, or have been reintroduced, to streams with marginal habitat; therefore, occupied habitat varies annually with climatic conditions.

UDWR and Forest personnel cooperatively monitor Forest CRCT populations on an approximately 7-year interval. Monitoring on all Forest conservation populations of CRCT occurred in 2006-2007. This monitoring showed that eight populations occur in approximately 34.6 miles of stream on the Dixie National Forest. This expansion was facilitated through nonnative trout removal in Pine Creek (Escalante), Pine Creek (Fremont), West Branch Pine Creek (Escalante), West Fork Boulder Creek, Twitchell Creek and White Creek from 2000-2003. This represents over a 4-fold increase in occupied habitat since the 5 remnant populations were discovered. Conservation populations also occupy 16.5 acres of lake on the Forest. Standing crop of CRCT in all stream conservation populations has remained stable or increased since the previous sampling period in 1998 (Table 3). An additional nonnative trout removal and CRCT expansion effort is being planned for East Fork Boulder Creek, which would further increase the range and abundance of this species on the Forest.

Table 3. Standing crop of current Colorado River cutthroat trout conservation populations in streams on the Dixie National Forest during monitoring in 1998 and 2006-2007, along with the percent change between the two sampling periods. Streams with an “na” in 1998 have been restored since that time.

Stream	1998 standing crop (kg/ha)	2006-2007 Standing crop (kg/ha)	Percent change
East Fork Boulder Creek	43	55	28
West Fork Boulder Creek	100	100	0
Pine Creek (Escalante)	na	46	na
West Branch Pine Creek (Escalante)	18	63	250
White Creek	44	105	139
Twitchell Creek	na	101	na
Water Canyon Creek	26	49	88
Pine Creek (Fremont)	na	42	na
Average	46	70	52

Resident Trout

Several species of nonnative trout are managed as sport fish on the Forest, including: brook trout (*Salvelinus fontinalis*), brown trout (*Salmo trutta*), rainbow trout (*Oncorhynchus mykiss*), and cutthroat trout (*Onconrhyinchus clarki*), as well as Arctic grayling (*Thymallus arcticus*) and several hybrid trout/char species. Collectively these species comprise the Forest MIS of “resident trout.” The Forest Plan States that a 20% total decline in resident trout population size over a 5-year period or a major change in quality of catch will cause further evaluation and/or change in management direction (p. V-5). Until Fiscal Year (FY) 2003 UDWR was the primary agency collecting fish population data. Their focus on lake sport fisheries and native trout restoration left many of the stream resident trout populations on the Forest unsampled. In FY2003 the Forest began its own monitoring program for MIS resident trout. Since that time a total of 88 quantitative sampling efforts have been undertaken (Table 4).

With the exception of years where few samples were taken, and a year where several marginal streams were sampled, standing crop for resident trout has been relatively consistent among years and has always been above average for southern Utah trout streams. Average resident trout standing crop at all sites sampled from FY2006-2010 was 12% lower than average resident trout standing crop at all sites sampled from FY2003-2005. Average standing crop from all sites sampled in 2010 was the primary driver for lowering the FY2006-2010 average. Several low elevation sites that were marginal trout habitat were sampled in FY2010, as well as several areas recently impacted by high flows that contributed low standing crop values to the FY2010 average.

Table 4. Fiscal year, average resident trout standing crop (kg/ha), and number of sampling efforts used to calculate the average standing crop.

Fiscal Year	Average standing crop (kg/ha)	Number of sampling efforts
2003	120.0295	9
2004	132.1994	21
2005	214.093	2
2003-2005	133.8949	32
2006	128.3065	15
2007	138.3936	4
2008	169.2017	6
2009	133.2614	9
2010	89.40403	21 ^a
2006-2010	117.6011	55

^a Several streams sampled in FY2010 had marginal trout habitat or had recently undergone high flow events, which is the primary reason for the lower average standing crop estimate in that year. Additionally one more stream, Moody Wash, was sampled in FY2010. This stream is a warm-water stream, so was not included in the analysis.

In addition Moody Wash was also quantitatively sampled in FY 2010; however, this stream is a warm-water system known not to contain trout, so it was not included in the analysis. Moody Wash is home to Virgin spinedace (*Lepidomeda mollispinis*), a Conservation Agreement species, which was added to the MIS list for aquatic habitat in a 2010 Forest Plan amendment. The FY 2010 sampling efforts indicated that the Virgin spinedace distribution and abundance in Moody Wash was stable to increasing.

While the overall standing crop of resident trout Forest-wide appears to be stable, standing crop declines of greater than 20% have been seen in five of 18 streams sampled more than once between FY2003 and FY2010 (Table 5). Sampling efficiency issues may explain the decline in resident trout standing crop between sampling years at the Carcass Creek and the East Fork Sevier River – 1 sampling locations. The Bear Creek D4 – 1 station was impacted by the Bear

Creek Fire in 2008 and the fish population at this site was completely lost in 2008. By FY2010 resident trout standing crop had improved from being completely eliminated (0) in FY2008 to being approximately 64kg/ha, which is average for southern Utah trout streams. The FY2010 standing crop estimate at this station was still 67% lower than the FY2003 estimate, prior to the fire impacts. Clay Creek is a very dynamic system with the potential for flashy flows and large amounts of bedload transport. Resident trout populations in this stream are probably founded by out migrants from Pine Lake. More recent sampling in Clay Creek indicates that large flood events have the capability to completely eliminate the fish community in this system. Bear Creek D2 saw a greater than 20% decline in resident trout standing crop between 2006 and 2009; however, native minnows and suckers were numerous in both sampling efforts, indicating that perhaps variable recruitment years may have influenced the 2009 sampling effort.

Table 5. Streams quantitatively sampled for resident trout standing crop in more than a single year, the Ranger District containing the stream, the 6th field Hydrologic Unit Code (HUC containing the stream), the years the stream was sampled, and whether a greater than 20% decline was noted (Y = yes and N = no).

Stream	Ranger District	HUC	Years sampled	>20% decline
Bear Creek D2	Cedar City	160300010508	2006, 2009	Y
Bear Creek D4 - 1	Escalante	140700050209	2003, 2008, 2009, 2010	Y
Bear Creek D4 - 2	Escalante	140700050209	2008, 2009, 2010	N
Blubber Creek	Powell	160300020302	2004, 2010	N
Carcass Creek	Fremont River	140700030303	2004, 2010	Y
Castle Creek	Cedar City	160300010201	2004, 2005	N
Clay Creek	Escalante	160300020401	2004, 2006	Y
Deer Creek - 1	Cedar City	160300010402	2003, 2008	N
Deer Creek - 2	Cedar City	160300010402	2003, 2008	N
East Fork Sevier River - 1	Powell	160300020302	2004, 2010	Y
East Fork Sevier River - 4	Powell	160300020301	2004, 2010	N
Fish Creek	Fremont River	140700030302	2004, 2010	N
Lake Creek	Escalante	140700050202	2003, 2007	N
Red Creek - 1	Cedar City	160300060109	2009, 2010	N
Red Creek - 2	Cedar City	160300060109	2009, 2010	N
Santa Clara River (downstream of FR 30337 culvert)	Pine Valley	150100080702	2003, 2005, 2008	N
Stout Canyon	Cedar City	150100080201	2004, 2010	N

Swain's Creek	Cedar City	160300010104	2003, 2010	N
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In the 2000s UDWR has spearheaded the majority of lake and reservoir sampling on the Forest with some assistance from Forest personnel. Lake and reservoir catch rates can be variable on the Forest because of variations in stocking rates, angling pressure, and possible winterkill issues depending on the depth and elevation of the water body. On the Forest, fish populations in most lakes and reservoirs are maintained through UDWR stocking programs.

Since 2001, 106 lake netting efforts have been undertaken on the Forest (Table 6). Catch rates in each year have been average to above average for southern Utah lakes and reservoirs. The average resident trout catch rate during 2006-2010 sampling efforts was 56% higher than the average resident trout catch rate during 2001-2005 sampling efforts. Sampling design, climate, and management are probably the three main reasons for the higher average catch rate from 2006-2010. In 2008 and 2009, few lakes were sampled and the lakes that were would be considered "trend netting" sites. These sites tend to be larger lakes and reservoirs that generally have less variability in survival than smaller lakes and reservoirs on the Forest. Additionally, 2006-2010 was generally wetter than 2001-2005, which may have led to increased lake depths and reduced winterkill problems. Finally a myriad of rotenone treatments were conducted in the first half of the decade to improve sport fishing in lakes across the Forest. As these lakes recover catch rates should improve.

Table 6. Year, catch rate for resident trout (trout/net night), and the number of lakes and/or reservoirs sampled on the Forest from 2001-2010.

Year	Trout/net night	Number of lakes/reservoirs
2001	25	12
2002	37	9
2003	28	15
2004	15	7
2005	17	16
2001-2005	24	59
2006	31	12
2007	41	15
2008	51	5
2009	37	4
2010	35	11
2006-2010	38	47

Lands

Special Use Permits, Applications, Amendments and Transfers

Approximate number processed per year is 10. There doesn't appear to be an increase or decrease in any particular type of use.

Special Uses (non-recreation) Permit Administration and Inspection

Approximately 130 permits are administered to standard each year. This is about 43% of the total land permits on the Forest. The Forest is meeting and usually exceeding the regionally assigned target each year. One of the requirements for administered to standard is inspection in accordance with service-wide schedule.

Land Exchanges

Land adjustment accomplishment is assigned to the regional zones rather than the forest. However, there have been no exchanges in the past 5 years (2006-2010). Presently, none are pending.

Rights-of-Way

Rights-of-Way acquisition is the responsibility of the regional zones rather than the forest. There have been no rights-of-way acquired during the period 2006-2010.

Construction of Through Utilities

A refined petroleum pipeline is presently being constructed through the utility corridor on the Pine Valley Ranger District. We are also working cooperatively with the BLM on the processing of 2 large electric transmission line proposals. Both propose crossing the Pine Valley Ranger District. These three applications for major utilities within a 5 year period is an increase over what we have had in the past.

Minerals

Exploration Proposals: Adequacy of Permitted Process

The Dixie NF has processed 3 individual Plans of Operations for exploration of locatable minerals since 2006. During this time there were no plans submitted for full mine development. Demand continues to be moderate and steady for mineral material disposals from common use mineral sites. Interest and demand continues from State, County, private, and commercial organizations to provide mineral materials (gravel, landscape rock etc.).

Lease/Permit Applications Forms and NEPA Process

There are roughly 1,300 expressions of interest for oil and gas leasing on the Dixie National forest. This is similar to the number of expressions of interest present in 2005. Until the

completion of the Oil and Gas Leasing Analysis on the Dixie NF, the BLM is not able to respond to these expressions of interest.

Site Specific Development Proposals and Administration of Operations, Compliance with Terms of Operating Plans and Existing Agreements

The Dixie National Forest receives 1-3 new proposals and or plans for locatable mineral materials per year. Approximately 20 to 50 saleable material permits are processed annually and compliance is completed for 26 oil and gas operations annually. This has been fairly consistent over the past decade.

Reclamation Results: Effectiveness of Work Done

Three small mine reclamations have been completed on the Dixie NF since 2006 resulting in the release of the reclamation bonds. Utah Department of Oil Gas and Mining in coordination with the USFS successfully closed and reclaimed three coal mines on the Escalante Ranger District in 2009.

Protection – Fire

Adequacy of Fire Prevention Programs

We measure the adequacy of our prevention programs by the number of human-caused fires. As shown in the table below, the human-caused fires have remained stable and fire prevention programs and initial attack on human-caused fires has been effective.

Number and Acres of Human-caused and Lightning-caused Fires from 2006 to 2010

Fiscal Year	Lightning Caused Fires and Acres Burned	Human Caused Fires and Acres Burned
2006	95 fires / 8,674 acres	9 fires / 41 acres
2007	72 fires / 2,640 acres	8 fires / 1 acre
2008	38 fires / 1,670 acres	11 fires / 3,733 acres
2009	50 fires / 17,827 acres	9 fires / 13 acres
2010	26 fires / 1,044 acres	11 fires / 1 acre
Total and Five Year Average	281 fires / 56 fires per year 31,855 acres / 6,371 acres per year	48 fires / 10 per year 3,789 acres / 758 acres per year

Number of Wildfires and Acres Burned

Over the last 5 years, a total of 35,614 Dixie National Forest acres were burned, which is a five year average of 7,123 acres. There were 329 wildfires on the Forest in the same timeframe averaging 66 fires per year.

Number of Wildfire and Acres Burned from FY2006 to FY2010

Fiscal Year	Number of Fires	Acres Burned
2006	104	8,715
2007	80	2,641
2008	49	5,403
2009	59	17,840
2010	37	1,045
Total and Five Year Average	329 (66 per year average)	35,614 (7,123 per year average)

Fire Management Effectiveness Index

We no longer use this reporting method because it does not adequately measure success of the fire program. As a surrogate for this obsolete metric, initial action effectiveness is calculated. Of the 311 fires from 2006 to 2010, only 1% on average have escaped initial action efforts. This high success rate also means that suppression expenditures were minimized. Typically, higher suppression costs are attributable to larger fires.

Initial Attack Effectiveness for FY2006 to FY2010

Fiscal Year	Wildland Fires managed with a Suppression Strategy	Fires Successfully Contained with Initial Attack	Initial Attack Success Rate
2006	96	95	99%
2007	75	74	99%
2008	44	42	96%
2009	59	57	97%
2010	37	37	100%

Compliance with Fuel Loading Standards

The Dixie National Forest used prescribed burns and mechanical treatments to reduce fuel loading during the last five years. The trends in fuels reduction projects:

- Prescribed fire activities have remained relatively constant, acreage accomplishment are highly dependant on fall and spring burn weather conditions.
- Mechanical treatments are dependent on budgets. Economic stimulus funding (ARRA) has provided for 15,200 acres of additional treatment in 2010 in the Duck Creek project area.

Fuels Reduction Treatments for FY2006 to FY2010

Fiscal Year	Prescribed Fires (Acres)	Mechanical Treatments (Acres)	Total Fuels Reduction (Acres)
2006	4,035	7,482	11,517
2007	4,892	12,291	17,183
2008	5,015	6,680	11,695
2009	3,992	6,628	10,620
2010	6,666	18,122	24,788

Protection – Insect and Disease

Population Levels of Insects and Diseases

A spruce beetle (*Dendroctonus rufipennis*) population grew to epidemic levels on the Cedar City Ranger District in the early 1990s. The beetle outbreak spread across the Markagunt Plateau, essentially killing over 90 percent of the over-mature/mature Engelmann spruce trees over tens of thousands of acres. By 2003, much of the Engelmann spruce component on the Cedar City Ranger District had been altered from an over-mature age class to a young seedling/sapling class as stands are replaced. This has allowed existing aspen clones to expand where live conifer overstory has been lost. During 2006-2010 spruce beetle infestations were dramatically decreasing as much of the mature spruce has already infested and lost to the beetle. Treatments on the Cedar City RD over the last five years have focused on salvage and reforestation of these beetle affected areas.

Spruce beetle populations also grew to epidemic levels on Mount Dutton on the Powell Ranger District in the mid to late 1990s. Similar to what occurred on the Cedar City RD, much of the mature/over-mature Engelmann spruce stands in this area are now comprised of spruce and subalpine fir seedlings/saplings, along with existing aspen clones. Treatments have mainly focused on salvage and reforestation of the spruce.

Spruce beetles continue to be active on the Escalante RD, as they have since the early 2000's. Aerial Detection Surveys from 2006 to 2010 indicate several thousand acres have experienced high levels of Engelmann spruce beetle infestations on the Escalante Ranger District, occurring in localized areas of the Griffin Top of the Aquarius Plateau. These epidemic outbreaks resulted in replacement of mature/overmature spruce stands with younger age class of spruce and subalpine fir seedlings saplings, and expansion of aspen clones. Treatments in spruce-fir stands that are not yet infested heavily with spruce beetles are designed to reduce susceptibility. In general spruce beetle related mortality has decreased on the Aquarius Plateau, visits by Forest Health Protection scientists indicate that this is mostly likely because of

a lack of suitable hosts including extensive losses to infestation. However, there are still high levels of concerns that beetles could outbreak in spruce fir stands at any time as they are still very susceptible. Spruce beetle populations continue to be monitored, and annual beetle trapping will continue on the Griffin Top.

Localized mountain pine beetle (*Dendroctonus ponderosae*) and western pine beetle (*Dendroctonus brevicomis*) buildups have been observed over the years as sustained drought conditions have created greater moisture stress and stand susceptibility, particularly in older trees. Approximately 2,000 mountain pine beetle infested trees ponderosa pine were treated in the Panguitch Lake Campground in an attempt to suppress further beetle infestations and retain ponderosa pine at that site. Also, in 2002 the campground was non-commercially thinned to reduce tree densities and subsequent risk of bark beetle infestation. The thinning has proved successful to date as no further infestations have been reported in this area. In 2009, the Kings Creek Campground on the Powell District received a thinning to reduce mountain pine beetle susceptibility and dwarf mistletoe incidence. Surveys are ongoing in the Kings Creek area, but to date no new infestations have been reported.

Other bark beetle activity includes Douglas-fir bark beetle (*Dendroctonus pseudotsugae*) and fir engraver beetle (*Scolytus ventralis*). Populations of these beetles have been increasing and infesting large areas of Douglas-fir and white fir trees. Aerial surveys have indicated since 2003 the Douglas-fir beetle have infested several thousand acres, as ground surveys confirm large areas of severe Douglas fir decline. The pinyon ips beetle population has reached epidemic levels in some areas, with Aerial Surveys indicating, since 2003, several thousand acres of pinyon/juniper type have experience high levels of infestation.

Root rot continues to be present on the Escalante RD. In earlier surveys, Forest Health Protection, Plant Pathologists detected Tomentosus root disease (*Inonotus tomentosus*) in several stands in the Row Lakes area of the Fremont RD, Fishlake NF, which is an area adjacent to the Escalante RD. Although only blue spruce trees were infected, this disease is known to infect all spruce species throughout south and central Utah. More recently FHP scientists suspect that it is located on portions of the Escalante RD that are adjacent to the Row Lakes area. Treatments in these areas will be designed to minimize the spread of root disease where present. As these areas are identified for treatments this will continue to be monitored.

Effectiveness of Dwarf Mistletoe Suppression Projects to Protect Regeneration

Dwarf mistletoe treatments have been prescribed in all affected timber sale project areas initiated in the period since the Forest Plan was adopted in 1986, and thousands of acres within individual control projects have been completed. Permanent plots have also been established to monitor the long-term effects of mistletoe on tree growth, though these studies are not complete at this time.

Treatment prescriptions and projects have been successful in reducing localized dwarf mistletoe infections. However, the disease continues to be widespread in many stands, requiring continued emphasis on treatment and management.

Range

Range Vegetation Condition and Trend

During 2006-2010, 1,023 long-term trend monitoring studies were completed on the Dixie National Forest. 649 were upland range trend monitoring studies, 203 of these monitoring studies were Level III Riparian Inventories and 171 were photo points completed by Forest personnel. 308 of 649 FS upland range trend monitoring sites (47%) were replicated studies from which accurate trend data can be derived. 56 of 203 of the FS Level III Riparian Inventories (28%) were replicated and have accurate trend available. 72 of 171 photo points (42%) were replicated and photo interpretive trend is available.

Of the 308 replicated upland range trend monitoring studies, the data analysis on 92 of them (30%) indicate a downward trend in vegetation condition, effective ground cover, and/or frequency of invasives. The other 216 sites (70%) demonstrated stable or upward trends. 34 of the 92 monitoring sites (37%) that indicate downward trends are located in areas of the Dixie National Forest that have burned (wildfire or prescribed fire) or been mechanically treated within the past 10 years. These burned and mechanical treatment areas are highly susceptible to cheatgrass invasion and low effective ground covers resulting from reduced fuel loads. There are a total of 11 monitoring sites of 308 sites (4% of all upland trend studies re-read between 2006 and 2010) where downward trends may be a result of mechanical or prescribed burn project-level management activities not influenced by uncontrolled wildfire. These 11 monitoring sites are located on the Cedar City, Powell, Escalante, and Teasdale (Teasdale portion of the Fremont River Ranger District) Ranger Districts. In summary, 69 monitoring sites of 308 sites (22% of all upland trend studies re-read between 2006 and 2010) exhibited downward trends that may be a result of any management activity not influenced by uncontrolled wildfire. Further evaluations of these sites are necessary to determine cause and if a change in management direction is needed and able to improve them.

Of the 56 replicated Level III Riparian Inventories, the data analysis on 8 of them (14%) indicate a downward trend in vegetative successional status, bank stability, and/or effective ground cover. These occur on the Pine Valley, Cedar City, and Escalante Ranger Districts. Further evaluation of these sites may be warranted to determine if a change in management direction is needed and able to improve them. A total of 48 of the replicated Level III Riparian Inventories (86%) demonstrate a stable or upward trend since they were last read between 2006 and 2010. There were 72 photopoints re-taken between 2006-2010 with trend available at this time. Eight of these photopoints indicated a downward trend. These photopoints were located on the 3 pastures of the Powell Ranger District and 1 pasture of the Teasdale Ranger District (Teasdale portion of the Fremont River Ranger District). Further evaluations of these sites are necessary to determine cause and if a change in management direction is needed and able to improve these sites.

In 1986, the Forest Plan did not define vegetation and soil (ground cover) conditions that would serve as a baseline from which to measure. Therefore, there are no reference conditions (from 1986) from which to measure trend. Since there is no baseline, sole reliance is placed on measuring trend during a defined time frame, from one long-term trend study reading to another. Therefore, variation (from one time-frame to the next) should cause further evaluation that may lead to a change in management. Of the 1,023 monitoring studies and photo points reported here, 436 (43%) had previously established baseline studies using current

methodologies where accurate trend data or photo interpretation could be derived. Other study sites may have previous readings, but this data was collected using various methods which are not compatible with current measurements and/or locations and photos could not be replicated. In the absence of periodically recorded post-1986 data, we cannot project a clear picture of how much the range has improved or declined over 1986 levels on the Dixie National Forest. However, current trend re-read from 2000-2010 does give a clear picture of trend on the Forest for that period of time. Of the 436 sites re-read and evaluated in between 2006 and 2010, 108 (25%) exhibited downward trends.

The Forest has established a long-term monitoring program, as indicated by the number of studies re-read or established in previous years (649 FS upland range trend monitoring studies, 203 Riparian Level III Inventories, and 171 photo points from 2004-2010). Over time, these studies will be repeated and trend data will become available. This data is stored in a retrievable database where it can be accessed and additional repeat studies can also be stored and compared.

Riparian Condition

Successional Status: The Forest Plan requires the Forest to maintain riparian areas at $\geq 60\%$ of potential for management level 3 riparian areas. Potential for late seral community types is defined by % gradient and substrate classes (Dixie NF LRMP IV-41 amended 9/95; revised 3/96). In a sample of 203 riparian sites across the Forest between 2006 and 2010, 126 of the sampled riparian areas (62%) are maintained at 60% of potential or above as required in the Forest Plan for management level 3 riparian areas. 2 riparian sites do not have this rating available because only woody species counts along the greenline were recorded. Woody species counts along the greenline do not convey successional status within these sampled riparian areas. An additional 34 sampled riparian sites are in a mid seral vegetation condition and have not yet been rated against the Forest Plan riparian standard described. 41 riparian sites or 20% are not being maintained at 60% of potential as required by the Forest Plan. 14 of these 41 riparian sites not meeting Forest Plan requirements are on the Pine Valley, Powell, and Escalante Ranger Districts and are the direct result of the Hawkins, Sanford, or Bear Creek wildfires burning through these areas in 2004, 2002, and 2008 respectively. These riparian areas have not yet recovered from these wildfires. Therefore, there are a total of 27 monitoring sites of 41 (13% of all Level III Riparian Inventories performed between 2006-2010) where downward trends may be a result of management activities not influenced by uncontrolled wildfire. The riparian areas that are not meeting Forest Plan requirements are located on the Pine Valley, Cedar City, Powell, Escalante, and Teasdale (Teasdale portion of the Fremont River Ranger District) Ranger Districts of the Dixie National Forest. Therefore, further evaluations of these riparian sites are necessary to determine cause and if a change in management direction is needed and able to improve them.

Stream bank stability: Forest Plan standards and guidelines for bank stability (general direction – standard and guideline 4A – pg. IV-42) and wildlife and fish (general direction - standard and guideline 6B – pg. IV-33) require that we “maintain 50 percent or more of total stream bank length in stable condition”. For this analysis, this standard is interpreted as maintaining 50 percent of all riparian areas with at least a moderate bank stability rating. Out of the 203 Level III Riparian Inventories sampled on the Dixie National Forest between 2006 and 2010, 183 or 90% had streambank stability ratings that were rated as moderate, good, or excellent. These ratings indicate long-term stable bank conditions in these riparian areas. There were 14 sample sites evaluated for the East Fork of the Sevier River drainage between 2006 and 2010. Of these 14 sample sites evaluated, all 14 (100%) of them had streambank stability ratings that were rated

as moderate, good, or excellent. Sampled riparian areas on the Dixie National Forest are meeting this Forest Plan standard and guideline. Therefore, no further evaluation and/or change in management direction is needed at this time.

Percent Ground Cover: Forest Plan standards and guidelines specific to management areas 4A, 9A, and 9B for ground cover in riparian areas (management area 4A direction – standard and guideline 4B – pg. IV-79, management area 9A direction - standard and guideline 3B – pg. IV-141, and management area 9B direction – standard and guideline 3B – pg. IV-150) require that the Forest: “Maintain at least 80 percent of potential ground cover within 100 feet from the edges of all perennial streams, lakes and other water bodies, or to the outer margin of the riparian ecosystem, where wider than 100 feet.”. Since no potential ground covers have been defined for riparian areas on the Dixie National Forest, for the purpose of this analysis, potential is assumed to be 100 percent for all riparian areas. Without desired conditions, the default assumptions become the most stringent assumptions. Out of the 203 Level III Riparian Inventories sampled on the Dixie National Forest between 2006 and 2010, 61 fell within management areas 4A, 9A, or 9B. Of these 61 monitoring sites, 23 had no information on ground cover. Of the 38 monitoring sites that had ground cover recorded, 11 (29%) had ground covers of less than 80% along the greenline. 3 of these 11 study sites that are below the Forest Plan standard have reduced ground cover resulting from wildfire. These 11 study sites not meeting Forest Plan standards and guidelines for ground cover in special management area riparian systems occur on all five Ranger Districts of the Dixie National Forest. Percent ground cover on these sites not meeting the standard need to be evaluated to determine cause and if a change in management is needed and able to improve them.

Forage Utilization

There are currently 78 active grazing allotments on the Forest, with 239 pastures, based on the data in INFRA, the database of record. The two tables below represent data as reported in the annual monitoring reports (Table A) and that found currently in INFRA (Table B). Discrepancies between the two tables are due to monitoring events as reported by the districts vs. what is found in the database of record. Emphasis in database recording did not occur until 2008 as shown by the low reported numbers in 2006 & 2007. Database reporting is now required for accomplishment reporting, as indicated by increasing number of monitoring events recorded. It is expected that monitoring levels in 2006 and 2007 were similar to those of 2008-2010. Methods used to monitoring compliance include stubble height, height/weight, key species, bank alteration, ocular reconnaissance and photo documentation.

Fiscal Year	Allotments Monitored		Allotments Exceeding Prescribed Utilization
	Total	%	
2006*	Unknown	Unknown	At least one
2007	60	74	5
2008	51	63	5
2009	50	62	5
2010	64	78	3

* 2006 report was not clear on total number of allotments monitored.

Table B. Compliance monitoring as reported in database of record (INFRA) (2006-2010).

Fiscal Year	Monitoring Events			Allotments Monitored		Pastures Monitored		Prescribed Utilization Standards Exceeded	
	Total	% in Riparian	% in Upland	Total	%	Total	%	Allotments	Pastures
2006	55	0	100	13	17	25	11	1	1
2007	47	4	96	13	17	26	11	2	2
2008	183	40	60	47	60	124	52	11	15
2009	204	32	68	49	63	125	52	8	10
2010	229	31	69	48	62	145	61	3	3

Forest Plan monitoring guideline for forage utilization state that if utilization standards are exceeded by more than 20% in a given year or by more than 10% consistently then further evaluation and/or a change in management direction is needed. When standards have been exceeded consistency with Forest Plan direction is met by discussing needed changes and are then implemented through the yearly Annual Operating Instructions.

Wild Horse Numbers and Habitat Trends

The North Hills Horse Management Area is on the Pine Valley Ranger District and is the only wild horse and burro territory on the Forest. Management of the area is coordinated with the BLM as the North Hills Area is adjacent to larger BLM management areas.

Wild Horse Numbers 2006 to 2010

Fiscal Year	Wild Horse Population	Number of Animals Above Management Area Objectives*	Horses Removed
2006	120	60	
2007	89	29	82
2008	129	69	
2009	170	110	
2010	208	148	18

* Current desired management objective is 60 animals.

Population trends match expected growth of about a 20% increase per year. Increases are primarily from reproduction with a percentage coming from the abandonment of domestic horses onto public lands.

Challenges on the area are distribution and elk. There is only one water source (Nephi Spring) which makes management of area difficult unless population numbers are maintained below management objectives. Distribution is primarily through salt placement. About 20-40 elk are now using the area leading to potential conflicts in the future. Forest Plan monitoring guidelines state that if horse numbers deviate by more than 10% of management objectives or range trend is down then further evaluation and/or a change in management direction is needed. Since the current number of animals is exceeding management objectives by more than 10%, a gather is planned for FY11. The objective would be to bring the number of animals within the management area to within 10% of the management objective of 60 animals. Additional wild horse removals will be scheduled based on national management priorities and funding availability.

Soils

Long Term Soil Productivity

Over the past five years 10 past fire sites were monitored for soil productivity. Overall, these fire have been not been a deterrent for long term soil productivity with the exception of three fires.

- The Bridge fire caused excessive rill and gully erosion from high intensity summer thunderstorms approximately nine months after the fire was contained. Excessive loss of the road prism in areas was also noted.
- The Corn Creek fire has had erosional effects associated with post fire effects and loss of road prism and landslides for 3 years after this fire was contained.
- The Stump Springs prescribed fire has removed too much large organic matter (wood) in the intermittent stream channel leaving the stream channel vulnerable to downcutting and releasing sediment stored in the channel. These areas should be avoided where possible with fire in and directly adjacent to intermittent stream channels.

Compaction

We monitored compaction on ten timber sales over the last five years. Results confirmed that compaction occurred during skidding on ground based operations (dragging the logs away from the harvest site) and at log landing sites. Typically, 3 to 7 percent of the timber sale units had experienced a 15 percent increase in bulk soil density. Timber harvests do cause compaction, but monitoring results showed that the proper use of Soil and Water Conservation Practices (SWCPs) kept compaction within acceptable levels.

Upland Areas Adjacent to Riparian Management Areas

Projects adjacent to riparian areas have generally been successful in the protecting of riparian areas. Two areas of management improvement can be noted from the analysis of the five year trend.

- Road drainage work and associated lead-out ditches are occasional causing problems with direct sedimentation into stream channels. Larger buffer areas and riprap at the ends of drainage ditches to dissipated energy are needed.
- Improper crossing design of stream channels associated with timber sale activities has caused direct sedimentation issues. These areas need better oversight and planning to avoid additional impacts to these riparian areas.

Soil and Water Resource Protection – Project Environmental Assessment Mitigating Requirements

Numerous implementation projects were monitored within the last five years and the majority (more than 90%) of the projects are effective in protecting the soil and water resource with design criteria.

Concerns with mechanical operations on fuels reduction projects and timber have been noted when the soils are too wet to be operated on. The problem time relating to soil moisture are

reoccurring in the spring (after winter thaw) and following late season monsoonal moisture. Additional contract and agency oversight is needed during these critical time periods to protect soil resource damage.

Soil Survey Activities

Data collection for the forest-wide field soil inventory has been completed and entered into a database (as directed in the Forest Plan, page II-52). Future analysis of this data will determine if additional field work is needed. Soil survey work will now shift to using the database to help with project and landscape scale analysis.

Soil and Water Resource Improvement Needs Inventory

District hydrologists continue to update the forest-wide watershed improvement needs inventory. This data will be used to plan watershed improvement projects. Other district resource specialists and the hydrologists will continue to coordinate the implementation of watershed improvement projects by clearly defining objectives and developing plans well in advance of implementation. Currently a three year watershed implementation project list is being maintained for FY2012 to FY2015.

Timber

Timber Harvest Area

The Dixie National Forest Plan requires that the timber program be monitored to ensure that actual harvested acres will not exceed the 10 year estimate by more than 10 percent. The 10 year average is currently estimated at 10,525 acres. For 2006-2010 an annual average of 884 acres were actually harvested, which is well below the 10 year estimate. Acres treated within this five year period are about the same as the previous five year range. However, previous to 2001, five year averages were noticeably higher. The amount of timber acres sold from 2006-2010 has been the same, or slightly higher, over the last five years. There has also been an increase in the use of Stewardship Contracts with timber removal, which most have sold. The use of Stewardship Contracts is expected to continue as this has proved to be a successful method of accomplishing other project objectives in a timber removal area.

Timber Sale Acres Sold and Harvested, 2006-2010

Fiscal Year	Total Acres Sold	Total Acres Harvested
2006	230	723
2007	4,604	1,354
2008	1,191	1,824
2009	616	318
2010	709	200
Total and Five Year Average	7,350 acres / 1,470 acres per year	4,419 acres / 884 acres per year

Suitable and Unsuitable Land Classifications

The Forest continues to update land classification for suitable timber through timber sale planning and other timber inventories. The following table describes the updated number of

total acres that are classified as suitable for timber production, and the number of timber sales that have been planned from 2006 to 2010.

Number of Sales and Acres Verified for Timber Suitability, 2006-2010

Ranger District	Number of Sales	Total Acres Verified
Cedar City	9	119,809
Escalante	4	95,362
Pine Valley	1	27,992
Powell	0	25,505
Total	14	268,668

The Forest Plan has identified 300,100 acres of land suitable for timber, which is greater than the total of 268,668 acres above. However, an accurate comparison is not possible until classification of timber stands is completed, which is ongoing.

Harvest Practices in Retention/Partial Retention

Reviews, prior to 2006, of retention/partial retention in timber sales have shown that for sales that were recommended for mitigation, all contained the mitigations in the environmental document and in the silvicultural prescription. Documentation of post harvest monitoring took place on seven sales which showed VQO's were met on four completed sales. There was not documentation to determine if VQO's were met on the remaining 94 percent of the sale. Post harvest monitoring has not been occurring or documented since before 2006.

Overall, specific visual protection measures are being documented in environmental analysis and silviculture prescription and are documented in only a few sales through post sale monitoring. There is a need for more consistent post-sale monitoring.

Harvest Practices in Riparian Areas

Reviews, prior to 2006, have indicated that riparian areas were adequately protected during timber sale implementation. A review of the environmental analysis documents and the timber sale contract, plus a review in the field during implementation have shown that over 90 percent had been adequately protected.

For the period 2006-2010, specific reviews have not been conducted in the field, but on projects where hydrologists are recommending specific protection measures, these are being documented through environmental analysis and are part of the silvicultural prescriptions, marking guidelines, and sale-area maps.

Overall, specific riparian protection measures are being carried through too the timber sale contract; however there is a need for more consistent post-sale monitoring.

Adequate Restocking

Most areas that were harvested through a final harvest treatment prior to the adoption of the Forest Plan have regenerated to an adequate restocking level. Most of the acres planted since 1990 have been associated with the Engelmann spruce bark beetle epidemic, which has destroyed much of the mature spruce on the Forest. Survival rates for the planted spruce

seedlings planted in 2010 have been excellent in the first year with 94 percent survival. Third year surveys for past spruce plantings are indicating survival rates at 68 percent. Spruce restoration has been highly successful where seedlings are established, this work is expected to continue for at least the next decade.

The Forest has begun planting ponderosa pine in burned over areas that are in need of reforestation. These planted areas have occurred on a variety of sites including some that are on harsh sites that were severely burned. The survival rates were excellent in ponderosa pine that was planted in 2010 with survival rates of 92 percent. Third year survival rates of ponderosa pine was 87 percent. A crucial aspect to ponderosa pine seedling survival was the installation of vexar tubing to protect seedlings from browsing.

Climate continues to be a challenge to seedling establishment. Drought has continued to affect survival of young trees; however, the use of containerized seedlings has improved seedling survival, especially on basaltic soils. Also, the use of microsites has improved survival rates. These high survival rates are encouraging and most of these planted areas are expected to contain adequate stocking within five years.

Overall, survival rates for planted stock are excellent across the forest on many types of sites. The use of container stock over the last few years have improved survival success and will continue to be used. There is a need to increase the forest's tree seed inventory, as collections of cones for Engelmann spruce have dramatically decreased with the high levels of mortality, but will need to be replenished as spruce is desired to be planted over many more projects. There is also a need to collect ponderosa pine seeds to reforest burned over sites as well as sustain ponderosa pine if there is a mountain pine beetle outbreak.

Maximum Size of Openings Created by Clearcuts

Numerous areas less than 40 acres in size were clearcut from 2006 to 2010 to meet regeneration and disease control objectives. There have been no perceived or recorded adverse effects to harvest practices, visual quality, or other resources values because of the size or location of the clearcut.

Reforestation and Timber Stand Improvement (TSI) Accomplishment

Thinning and reforestation accomplishments are lower than the projections of the Forest Plan due to the decline in commercial timber harvesting and the accomplishment of most thinning needs early in the monitoring period. The Forest Plan projects 5,000 acres per year in thinning and 1,588 acres per year in reforestation.

TSI accomplishments from 2006 to 2010 included precommercial thinning of 11,852 acres across the forest. A majority of these acres were in conifer stands to improve growth and forest health. Much of the improvement in ponderosa pine and Douglas fir included mistletoe control and other diseases. Several thousand acres included thinning as part of the Duck Creek Fuels Reduction project on the Cedar City RD, where the primary objective was to reduce fuels in this Wildland Urban Interface. Other TSI projects included maintenance of aspen clones, by removing encroaching conifers. Over the last two years several hundred acres of aspen have been treated to remove conifers within these stands to maintain the aspen clone. Expectations are to maintain TSI accomplishments at around 2,000 acres per year.

Reforestation accomplishments from 2006 to 2010 included over 1,100 acres of planting across the forest including the planting of Engelmann spruce seedlings in high spruce beetle mortality areas on the Cedar City RD. Also, over 300 acres of ponderosa pine planting occurred on burned areas of the Escalante RD. Artificial reforestation activities are expected to continue in the next few years with an emphasis in Engelmann spruce restoration and reforestation of ponderosa pine or Douglas-fir on burned over areas across the forest. Certification of natural regeneration is expected to increase as more aspen stands are being treated for regeneration. Expected outputs are to maintain planting levels at 200-400 acres per year as projects are planned, certification of natural regeneration is expected to increase to around 100 acres per year in the near future.

Acres Thinned and Reforested, 2006-2010

Fiscal Year	Timber Stand Improvement (Acres)	Reforestation (Acres)
2006	2,376	104
2007	3,645	138
2008	2,283	380
2009	1,584	268
2010	1,964	254
Total and Five Year Average	11,852 acres / 2,370 acres per year	1,144 acres / 229 acres per year

Fuelwood Consumption and Supply

Vegetative management practices on the Forest result in the availability of an estimated 14,000 cords of fuelwood annually. During the first five years of the Forest Plan period, an average of 7,446 cords of fuelwood was utilized each year. After natural gas was delivered to the major population centers in the area, the fuelwood consumption has declined to approximately 5,000 cords per year. In the past 5 years, the Forest has continued to experience catastrophic Engelmann spruce tree mortality due to a spruce bark beetle epidemic. This has resulted in thousands of acres of dead trees and heavy volumes per acre of fuel loading, contributing to an increasing amount of fuelwood availability.

Fuelwood (Cords) Permitted by Ranger District, 2006-2010

Fiscal Year	Pine Valley	Cedar City	Powell	Escalante	Total
2006	1,108	3,351	1,355	738	6,552
2007	765	2,128	897	516	4,306
2008	812	2,259	1,107	540	4,718
2009	732	2,410	1,172	478	4,792
2010	802	2,351	1,120	609	4,882

Timber Supply Projections

The latest Forest inventory (1998) showed the following results regarding sawtimber on non-reserved timber lands (i.e., lands not specifically designated for timber harvest):

- Net volume is 3,534,863 MBF (thousand board-feet),
- Net annual growth is 45,134 MBF, and
- Annual mortality is 53,763 MBF.

Timber Research Needs

Long term monitoring for spruce beetles (*Dendroctonus rufipennis*) continues on the Griffin Top area of the Aquarius Plateau on the Escalante Ranger District. These studies are designed to determine infestation levels in harvested and non harvested forested areas. These studies conducted by the Dixie National Forest and Forest Pest Management (FPM) are indicating that while spruce beetle caused mortality has decreased on the Plateau, many stands are still at high to moderate susceptibility, and are of concern because spruce beetles are capable of long distance dispersal, and with the general depletion of host resources on Griffin Top, populations may begin to spread north and east (Hebertson 2010). One conclusion so far is that, prevention strategies including silvicultural treatments, such as thinning and group selection offer the greatest chance of reducing long-term susceptibility to spruce beetle infestation because they increase diversity of species and structure across the landscape. If silvicultural treatments are used, they must occur while spruce beetle populations are at low levels to maximize their effectiveness (Hebertson 2010). Spruce beetle monitoring will continue in this area.

Also, the Forest, in conjunction with FPM, has been looking at timber harvest and slash treatment methods to control the spread of Tomentosus root rot (*Inonotus tomentosus*) in Engelmann spruce and blue spruce. This disease has been detected by pathologists in several stands of blue spruce on the Aquarius Plateau in several stands in the Row Lakes project area. Although only blue spruce trees were infected, this root disease is known to infect all spruce species throughout south-central Utah. Harvesting, particularly partial cutting, could intensify the root disease and potentially affect residual spruce or spruce regeneration. Recommendations are to minimize partial cutting in those portions of stands where Tomentosus root disease is prevalent or favor disease tolerant species such as aspen or Douglas-fir where possible.

Visual Resource

Compliance with Visual Quality Objectives

High Quality Scenery on the Dixie National Forest is declining. Scenery Management is based upon two important values. One is the “visual quality” of form, line, color, texture and diversity of a given forest. The second is the ecological health or scenic sustainability of a given forest. So, long before the visual decline of a forest becomes evident, pro-active management of the ecosystem is critical to scenic sustainability. The scenic resources of the Dixie National Forest are being eroded in the following ways:

- Pinion pine and juniper forests are dominating and have become class “C” landscapes with no variety. In these forest types there is little to no vegetative undergrowth, no textural change from a landscape perspective, and no diversity from a scenic stand point. Large, stand replacing fires are likely. This landscape character change would not meet the SIO of High.
- High elevation Englemann spruce forests are dead in many areas of the Dixie. Spruce bark beetle epidemics over the past 10 years, especially on the Cedar City Ranger District have changed the landscape character and do not meet the SIO of High.
- Severe weather during the winter of 2010/11 resulted in thousands of up rooted trees and broken tree tops on the ground. Campgrounds, sensitive forest roads, and scenic byways have been impacted.

- The expansion of utilities is cumulatively impacting the scenic resources of the Dixie National Forest.

Actions to reverse this trend include the Midway Timber Sale (2009) and the proposed Navajo Basin Scenic Recovery Project on the Cedar City Ranger District.

Water

Compliance with State Water Quality Standards

Forest hydrologists have sampled and analyzed water quality on the following six sites over the last five years to compare the results with state water quality standards.

Water Quality Sampling Sites from FY2006 to FY2010

Sites Sampled	FY06	FY07	FY08	FY09	FY10
Santa Clara River	X	X	X	X	X
Bowery Creek	X				
Wilson Creek		X			
Pinto Creek			X	X	X
Antimony Creek					X
Water Canyon Creek					X

The most common exceedence occurred with phosphorous on these sites. The majority of the exceedences were during a high flow, other high flows not associated with spring snowmelt did not show changes in pH or phosphorous commensurate with changes in flow; therefore phosphorous and pH levels are less likely to have a relationship with flow or sedimentation at this site and more likely to be related to the surrounding geology and perhaps ion elution associated with snowmelt.

Results from many sampling sites from different years on the forest are starting to show a trend of perpetually exceeding standards for phosphorus, leading to a hypothesis that native geology is playing a measurable role in phosphorus input to many of the streams in southwestern Utah.

Effectiveness of Best Management Practices in Meeting Water Quality Objectives and Goals

Soil and Water Conservation Practices (SWCPs) are recognized as best management practices with the State of Utah Division of Water Quality. SWCPs were monitored at sixteen locations over the last five years. The SWCPs specified in the projects were 81% effective in their objectives. Three notable problem areas occurred in implementing projects.

1. SWCPs associated with prescribed fire did not have a sufficient amount of ground cover on the project to deter soil erosion.
2. SWCPs for sediment control around bridge construction was lacking.
3. SWCPs for erosion control on road obliteration failed to meet objectives.

Compliance with Utah Public Drinking Water Regulations

Positive bacterial samples and fecal coliform tests have exceeded the allowable maximum contaminant level on a few sites over the last five years. Follow up testing on these sites showed acceptable water quality. The trend for public drinking water quality is stable with only isolated compliance issues that are dealt with on site specific management.

Effectiveness and Maintenance Needs of Watershed Improvements

Numerous watershed improvement projects were revisited over the last five years to determine the effectiveness and maintenance needs of these improvements. The trends in watershed improvements can be grouped into the following four categories.

- Road relocation efforts have been successfully implemented on the forest. Full obliteration and full recontouring of old roads has proven effective in restoring compacted soil surface in riparian areas.
- Road closures have been about 75% to 88% effective with the use of road barrier and coarse woody debris to block travel on closed roads. Some areas do not have vegetative growth that is capable to limit traffic to closed roads and will continue to be a problem unless enforcement actions and signing can inhibit unauthorized use.
- Exclosures on the forest are effective in restoring riparian condition, recurring maintenance on these sites though have proven to be expensive and at times ineffective in protecting these areas from browsing when fencing problems occur.
- Dispersed recreation sites management and closures have been highly effective in controlling camping use within riparian areas. Designation of sites and the improvement of camping areas designated have lead to an overall improvement of these over utilized areas.

Accomplishment of Riparian Area Management Goals

Measurements such as pebble counts, cross-sections, and photo points have been collected over the last five years. This data has been used mainly to establish long-term monitoring sites and collect baseline data. Ideally, more than 10 years of data are needed to distinguish a trend in a system. We must continue to collect data for those sites before we can infer a trend with more certainty. Initial trend results from some of the sites are summarized below.

- Cattle impact has been reduced, Antimony and Ranch Creek are beginning to show signs of a more stabilized channel.
- Post fire stream channel effects are highly variable but overall are showing signs of stream channel substrate recovery.

Wilderness

Condition of Campsites and Surrounding Area

Wilderness campsites were inventoried and monitored in 2001 and 2006. Based on impact rating scores and Frissell ratings campsite conditions are stable in all three wilderness areas. Four new sites were located in the Pine Valley Wilderness for a total of 68 sites, however 3 sites inventoried in 2001 could not be relocated in 2006. Ashdown Gorge Wilderness and Box Death Hollow did not have an increase in campsites. Although campsite impact trends are important,

site proliferation is of the most concern in Dixie's wilderness areas. The Cottonwood Forest Wilderness area was designated in 2009 and therefore a campsite inventory has not been performed, however it is scheduled for the summer of 2011.

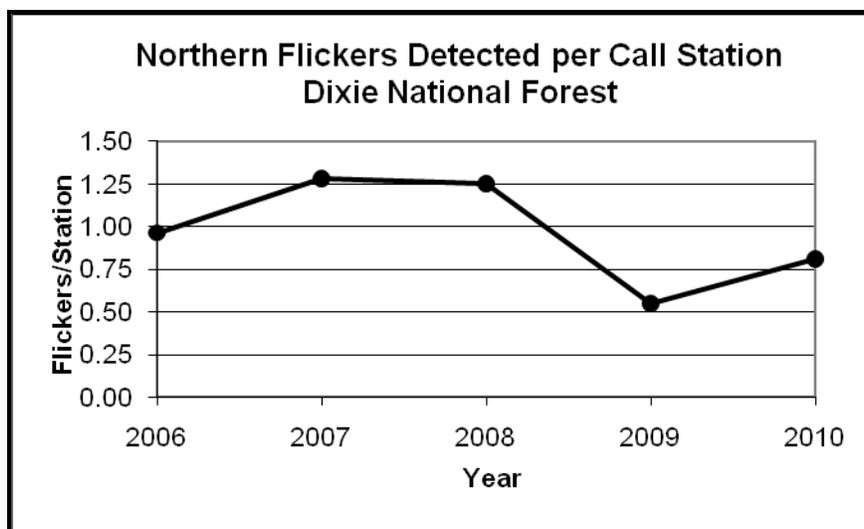
Amount and Distribution of Human Use

Wilderness visitation numbers have been stable with no notable increases or decreases. Trail counter data shows a relatively low number of visitors in the Ashdown Gorge Wilderness and the Box-Death Hollow Wilderness Areas. The Pine Valley Mountain Wilderness area receives higher visitation than the other wilderness areas, but is still relatively low. In addition, many of the trail counts for the Pine Valley Mountain are from people on day trips and/or only travel a short distance into the wilderness.

Wildlife

Common Flicker

The chart below shows northern flicker detections per call station from 2006-2010 on the Dixie NF.



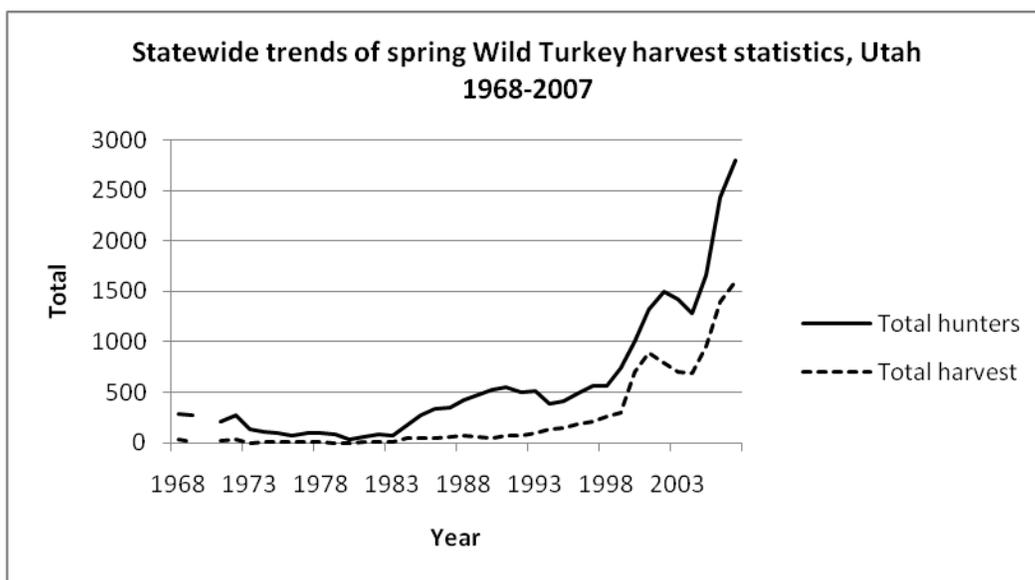
A total of 271 flickers were detected in surveys of 334 call stations, resulting in a detection rate of 0.81 flickers per station in 2010. This is an increase from 0.55 flickers per station in 2009. Detection rate was lowest in 2009 (0.55 flickers/station), and highest in 2007 (1.28 flickers/station). The variation in detection rates is likely due to changes in precipitation, insect populations, and weather conditions during the monitoring period.

This species is well-distributed, occurring on each Ranger District over a variety of habitat types. Protective measures exist under the snag and downed woody debris standards and guidelines section of the Forest Plan. These measures are implemented Forest-wide, and are effective in managing and protecting important habitats for cavity nesters, including flickers.

Wild Turkey

Utah’s wild turkey populations are thriving and expanding across the state; they’ve grown so much, in fact, that the Utah Wildlife Board approved Utah’s first statewide general-season turkey hunt for 2010 (UDWR 2009). The RAC process is used to make population management recommendations, and the Utah Wildlife Board makes all decisions on population management.

Based on the data provided by the UDWR (UDWR 2008), the total harvest of turkey in Utah has increased sharply in recent years. The chart below shows this increase, which reflects an increase in birds statewide, including the Southern Region and lands administered by the Dixie NF.



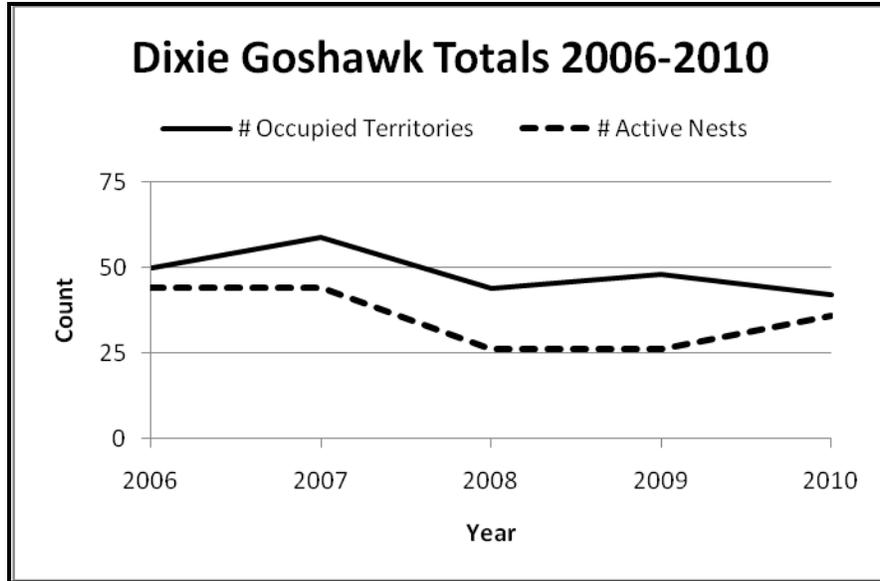
*No spring season in 1970.
 **2002-2004 data does not include conservation permit information.
 ***2005 data does not include conservation permit or landowner permit information.

Based on this information, turkey populations are in an upward trend; therefore, populations are persistent in the Southern Region, including lands administered by the Dixie NF. Because turkeys are such a common species, they are frequently observed, and incidental sightings are recorded across the Forest.

Northern Goshawk

The increase in territories monitored is due to the discovery of new territories. Additional territories were very likely occupied, but the absence of bird detections during the site visit prevented categorizing them as such.

Northern Goshawk Monitoring Results					
Status	2006	2007	2008	2009	2010
Territories Monitored	138	147	148	146	162
Occupied Territories	50	59	44	48	42
Active Nests	44	44	26	26	36



The total number of occupied territories in 2010 decreased slightly from 2009, but confirmed active territories increased. Factors such as temperature and timing and amount of precipitation affect goshawk distribution, survival, and reproduction. Climatic factors also impact prey species population size and distribution. Although overall numbers fluctuate, the number of occupied goshawk territories across the Forest is high and well-distributed among Ranger Districts. These results may indicate that our present method of protecting the species is adequate.

Mule Deer and Rocky Mountain Elk

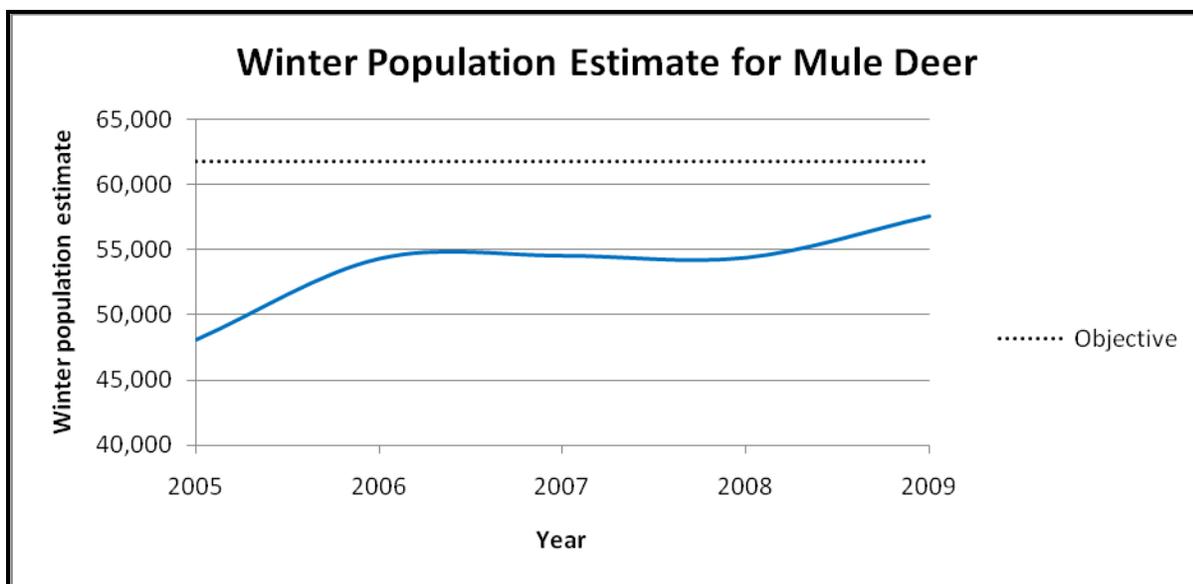
The Dixie NF contains portions of seven different Wildlife Management Units (WMUs) in the Southern Region: Boulder Plateau, Kaiparowits, Mount Dutton, Panguitch Lake, Paunsaugunt, Pine Valley, and Zion. Currently, elk habitat has not been defined within the Pine Valley WMU, although the Utah Division of Wildlife Resources (UDWR) manages a limited number of elk in the area. The data below comes from the 2009 Utah Big Game Annual Report (UDWR 2009).

The table below displays winter population estimates from 2005-2009 for mule deer in the seven WMUs that overlap the Dixie NF, including two additional Boulder units.

Mule Deer Winter Population Estimates by WMU

WMU	% Useable habitat within Dixie NF	Management Plan Objective	2005	2006	2007	2008	2009
Boulder Plateau	50%	22,600	15,400	17,000	15,800	12,000	15,500
Kaiparowits	3%	1,000	400	400	400	1,000	400
Mount Dutton	62%	2,700	1,700	2,000	2,300	2,500	2,400
Panguitch Lake	61%	8,500	7,150	8,925	8,700	10,000	10,500
Paunsaugunt	15%	5,200	5,100	6,500	6,600	6,000	5,800
Pine Valley	55%	12,800	11,700	12,500	13,400	13,400	13,400
Zion	9%	9,000	6,600	7,000	7,350	9,500	9,600
Total:	35%	61,800	48,050	54,325	54,550	54,400	57,600

The chart below displays the data provided in the table above.



*Objective determined in Deer Management Plan

The Dixie NF contains summer, winter, and year-round habitat for mule deer populations. Amount of habitat varies with WMU, and altogether the Dixie National Forest administers only 35% of useable habitat within the seven WMUs. Accurate estimates of populations on the Boulder Plateau are obscured due to the addition of the Fishlake and Thousand Lakes Boulder units. With the exception of the Boulder units, only the Kaiparowits and Mount Dutton units are slightly under objective, while the other units are at or over objective.

All big game species in Utah are managed by the UDWR. The Regional Advisory Council (RAC) process is used to make population management recommendations, and the Utah Wildlife Board makes all decisions on population management. The Forest Service has a

representative on the RAC; however, the Forest in no way has control over population numbers. It should be noted that a WMU may be within approved population objectives, and as a result of UDWR management strategies, population numbers may be reduced.

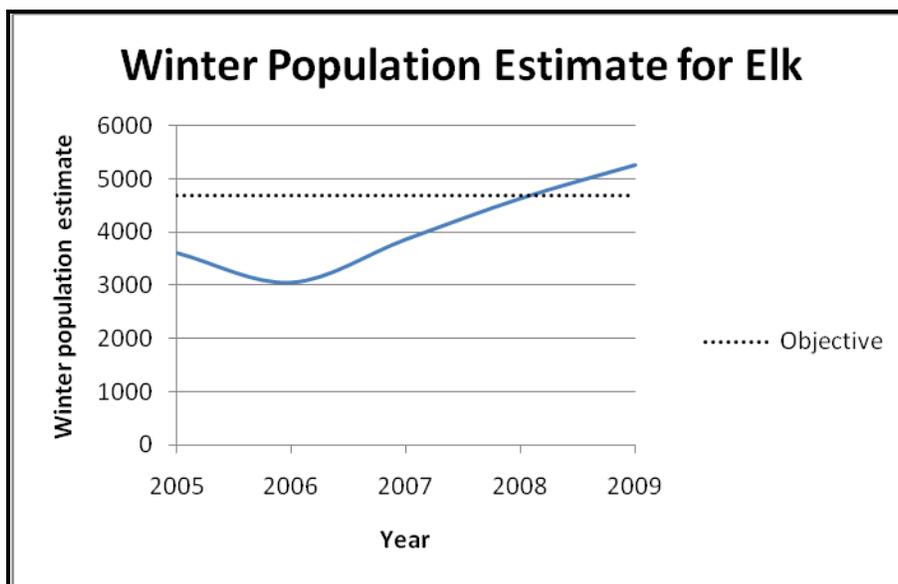
Deer populations appear to be healthy and will continue to persist across the Forest.

The table below displays winter population estimates from 2005-2009 for elk in the six WMUs that overlap the Dixie NF.

Elk Winter Population Estimates by WMU

WMU	% Useable habitat within Dixie NF	Management Plan Objective	2005	2006	2007	2008	2009
Boulder Plateau	58%	1,500	400	500	900	1,500	1,800
Kaiparowits	51%	25	25	25	25	25	25
Mount Dutton	77%	1,500	1,600	1,270	1,400	1,500	2,000
Panguitch Lake	75%	1,100	1,150	872	950	1,000	800
Paunsaugunt	33%	200	75	24	30	50	100
Pine Valley		50	50	50	50	50	50
Zion	5%	300	300	300	500	500	480
Total:	54%	4,675	3,600	3,041	3,855	4,625	5,255

The chart below displays the data provided in the table above.



*Objective determined in Elk Management Plan

The project area contains summer, winter, and year-round habitat for elk populations. The amount of habitat within the project area varies with WMU, and altogether the Dixie National Forest administers only 54% of useable habitat within the six WMUs.

Elk populations appear to be healthy and will continue to persist across the Forest.

Snag Habitat Maintained in Desired Spatial Arrangement

The Dixie National Forest adopted the Northern Goshawk Forest Plan Amendment in 2000, which placed more emphasis on snag retention than previous Forest Plan direction. Snags are represented in all habitat types and are protected through Forest Plan guidance. Due to widespread bug infestations and fires across the Forest, snags are widespread and distributed across all Ranger Districts. Snags in the Ponderosa pine type are in the greatest shortage due to unauthorized fuelwood collection. Engelmann spruce is the most abundant across the Forest due to beetle infestations on all Ranger Districts.

Downed Woody Material and Logs Maintained in Sufficient Amount, Sizes, and Spatial Locations

The Dixie National Forest adopted the Northern Goshawk Forest Plan Amendment in 2000, which placed more emphasis on snag and down woody debris retention than the previous Forest Plan direction. Down woody debris is well represented in all habitat types across the Forest with the exception of some areas that have had fire. The distribution and size of downed woody debris across the Forest is adequate to meet the Forest requirements.

Grazing Management and “At Risk” Goshawk Locations

There are no goshawk territories on the Forest that have been identified as being threatened by livestock grazing within the last five years; therefore, no “At risk” areas have been identified.