

MAMMOTH CREEK WATERSHED

Rural social values and life-styles, in conjunction with a long heritage of ranching and farming, continue to shape areas within the Mammoth Creek Watershed. However, in recent years, the watershed has also become a popular recreation and summer use area and is noted for its scenic

landscapes and popular trout fishing waters. Hiking, cycling, picnicing and ATV riding opportunities are available during summer months, while snowmobiling and cross-country skiing continue to be popular winter-time activities.

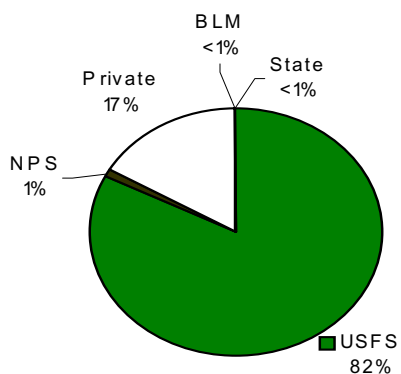


Fig. 4-7. Land ownership within the Mammoth Creek Watershed is primarily U.S. Forest Service lands.

Land Ownership

The Mammoth Creek Watershed contains only four subwatersheds – Lower Mammoth Creek, Middle Mammoth Creek, Tommy Creek and Upper Mammoth Creek – and is the smallest watershed within the Upper Sevier River Basin at only 74,776 acres (Table 4-4). While U. S. Forest Service lands dominate (61,729 acres), private land areas consisting of private ranches and homes occupy 12,402 acres. Bureau of Land Management lands (54 acres), National Park Service (541 acres) and state lands (41 acres) are also found within the watershed (Figure 4-7, 4-8).

Vegetation Types

Lands within the Mammoth Creek Watershed are dominated by aspen and are valued as luxuriant summer range for livestock and as prime habitat for many species of wildlife (Fig 4-9, Table 4-5). Over 30,000 acres of Englemann spruce within the Mammoth Creek and surrounding watersheds are dead or dying as a result

Mammoth Creek Subwatersheds	Acres
Lower Mammoth Creek	18520
Middle Mammoth Creek	16102
Tommy Creek	14239
Upper Mammoth Creek	25906
Total	74766

Table 4-4. The four subwatersheds in the Mammoth Creek Watershed contain the least number of acres within the Upper Sevier River Basin..



The Mammoth Creek Watershed is noted for its productive and colorful aspen forests.

of a recent spruce beetle epidemic. This extensive mortality is visible along many travel routes within the watershed and also creates fire safety concerns for several mountain home subdivisions. Dealing with this epidemic has generated much discussion and many questions from the public, landowners and land management agencies alike.

The rim of Cedar Breaks National Monument, located along Highway 143, is over 10,000 feet above sea level, and is forested with islands of Englemann spruce, subalpine fir, bristlecone pine and aspen. In the summer, abundant meadow areas provide habitat for deer and elk, as well as numerous birds and small mammals.

Elevation, Roads & Streams

Brian Head Peak is the highest point within the Upper Sevier River Basin at an elevation of 11,307 feet. The eroded rock formations of Cedar Breaks National Monument mark the western edge of the watershed, while spring-fed Mammoth Creek flows through the middle. Interestingly, on top of Brian Head peak stands an observation point constructed by the Civilian Conservation Corps (CCC) between 1935-1937. This rock and wooden structure is exemplary of the fine craftsmanship and architecture of the CCC, and is an often-visited spot within the watershed. The Brian Head chert rock formations found throughout the area were used extensively as a source of stone for arrowheads by early native Americans. Brian Head ski resort to the west of the peak, and part of the Beaver River Watershed, offers some of the best downhill skiing and snowboarding in southern Utah. On a typical day, you can see over 100 miles and peer into Nevada, Arizona and Utah from the top of Brian Head Peak.

From vantage points along Highway 14 and 143, visitors to the watershed can look into Cedar Breaks - a huge natural amphitheater that has eroded out of the variegated Pink Cliffs. Millions of years of sedimentation, uplift and erosion have created the deep canyon of rock walls, fins, spires and columns, spanning some three miles, and over 2,000 feet deep.

Mammoth Creek, after flowing over 20 miles through mountains and forests, intersects with the

main stem of the Sevier River, near the town of Hatch, Utah. The creek is a popular spot for anglers and provides opportunities to catch wild brown trout and hatchery rainbow trout.



Vegetation Type	Acres	%
Agriculture	452	1%
Aspen	6753	9%
Grass/Forb	4977	7%
Mixed Conifer	6985	9%
Mountain Shrub	76	0%
Pinyon/Juniper	4372	6%
Ponderosa Pine	18135	24%
Sagebrush/Grass	8980	12%
Spruce/Fir	15812	21%
Other	8225	11%
Total	74766	100%

Table 4-5. Although only a small portion of the watershed, tall forb communities are considered high priority for protection by resource personnel.

This structure that stands atop Brian Head Peak was built by the Civilian Conservation Corps during the depression. The still standing structure is a popular tourist spot within the watershed.

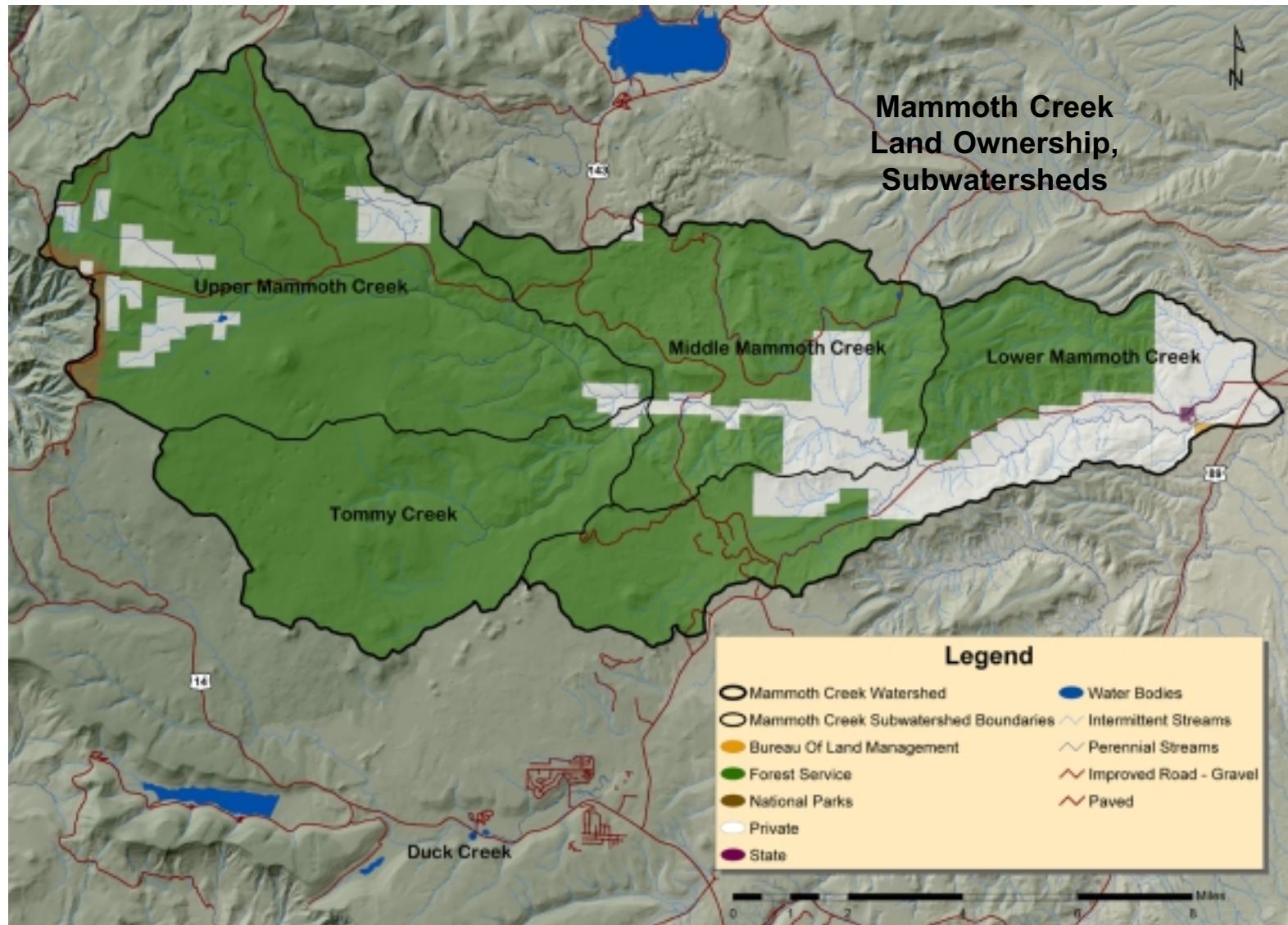


Fig. 4-8. U. S. Forest Service lands encompass eighty-two percent of the Mammoth Creek Watershed. This watershed is a popular camping, hiking and recreational use area.

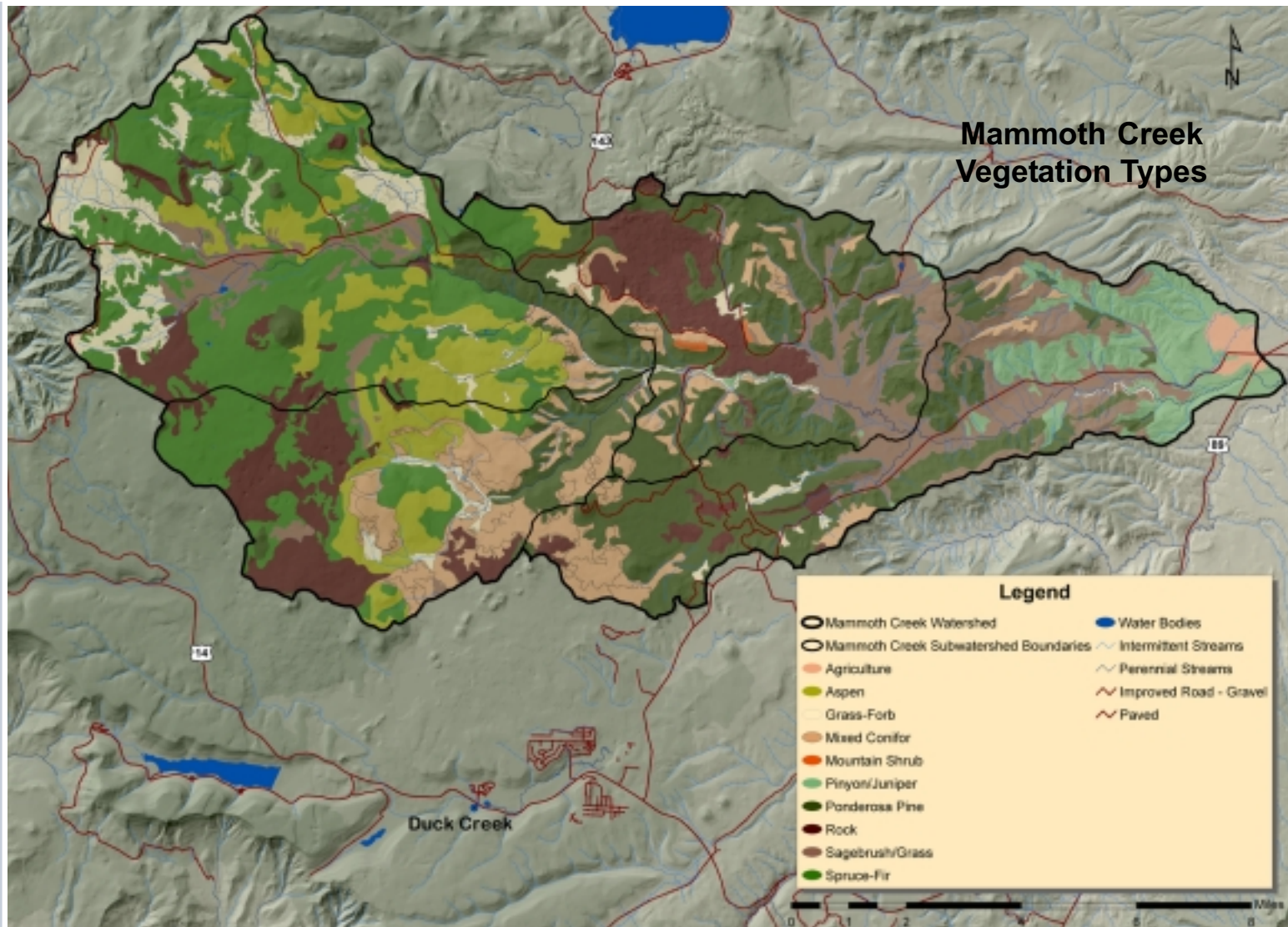


Fig. 4-9. The Mammoth Creek Watershed is highly valued for its scenic areas, with colorful high mountain meadows, portions of Cedar Breaks National Monument, abundant wildlife and dense ponderosa pine and aspen forests.

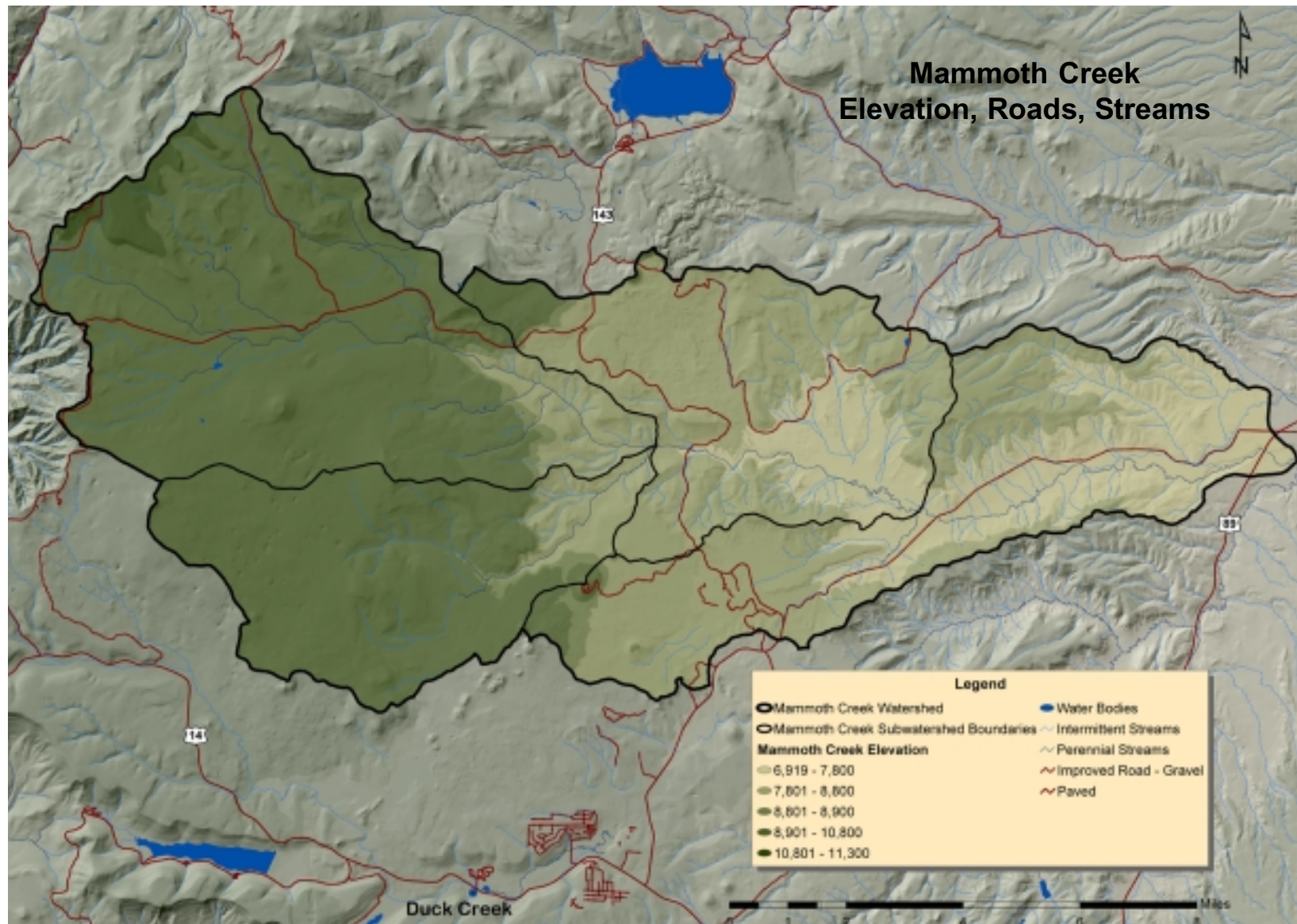


Fig. 4-10. Brian Head Peak, at 11,300 feet in elevation, is the highest point within the Upper Sevier River Watershed. Expansive high mountain tall forb meadows once dotted the watershed; however, high ungulate use has all but eliminated most of these areas.

Key Issues

Key issues identified for the Mammoth Creek Watershed are: 1) Aspen/Mixed Conifer - Vegetation Composition; 2) Communities at Risk to Wildfire; 3) Development and Effects to Ground/Surface Water & Summer Home Development; 4) Development and Impacts to Adjacent Lands; 5) Enhancement and Protection of Goshawk Habitat; 6) Enhancement and Protection of Riparian Habitat & Riparian Vegetation Composition; 7) Noxious Weeds; 8) Ponderosa Pine - Fuel Conditions; 9) Spruce Fir - Fuel Conditions; 10) Tall Forbs - Vegetation Composition; 11) Wildlife Management in Agricultural Areas (Figure 4-11). (Other issues and ratings within the Mammoth Creek Watershed are listed in Table 4-6.)

1. Aspen/Mixed Conifer – Vegetation Composition

Current Conditions, Patterns and Trends

Approximately 60% of quaking aspen stands have converted to stands of conifers in areas throughout the Upper Sevier River Basin (USFS, 2000). Existing aspen stands within the Midway Valley-Midway Creek, Deer Valley-Midway Creek, Strawberry Creek and Swains Creek subwatersheds are old (ranging in age from 60 to 100 years) and lack structural diversity. In pure older aspen stands, the absence of some type of disturbance has resulted in old aspen clones dying with no possible regeneration, resulting in an increase in continuous patches of mixed conifer. Aspen are important components of a healthy ecosystem, providing cover and forage for a variety of wildlife species and livestock, maintaining healthy watershed conditions, enhancing soil productivity and providing aesthetically pleasing landscapes.

Reference Conditions, Patterns and Trends

Fire has been the most important disturbance factor in aspen communities, influencing changes in structural stages and minimizing dominance by conifer species. Many stands classified today as conifer actually contain an aspen component, and would be dominated by aspen under a normal disturbance regime. Fires of mixed severity (depending on associated species) maintained vegetation mosaics and aspen dominance across much of the landscape. Structural stages consisted of approximately 40% grass/forb and seedling/saplings, 30%

young, mid-age, and mature, and 30% old forest, with 85% ground cover (USFS, 2000).



Although numerous aspen stands occur throughout the Mammoth Creek watershed, many are old, with little or no new regeneration. Conifer encroachment as well as lack of fire have resulted in a decrease in aspen diversity, further affecting conditions within the watershed.

Natural/Human Causes of Change Between Current/ Reference Conditions

Fire suppression and ungulate grazing have contributed to a decline in historic aspen stands. Ungulate grazing has reduced accumulations of fine fuels (shrub and herbaceous layers), resulting in few fire starts, occurrence of small fires, and contribution to the reduction and/or elimination of young aspen regrowth. Fire return intervals (generally 20 to 100 years) are less frequent today, allowing spruce-fir and mixed conifer types to replace previous aspen-dominated stands.

2. Communities at Risk to Wildfire

Current Conditions, Patterns and Trends

Fire regimes of frequent, small intensity fires have been altered from historic conditions, resulting in a build-up of fuels which pose a higher fire risk to area residence and fire fighters. In addition, the risk of losing key ecosystem components as well as community structures remains high, especially in developed areas along Highway 14, including areas in and around Tommy Creek, Mammoth Creek, Castle Valley, Rainbow Meadows and Meadow Lakes Subdivisions. Ponderosa pine forests have changed from open, park-like areas with scattered large trees to stands with dense thickets of small-diameter trees which are at risk of burning due to high amounts of fuel accumulations. Mixed conifer areas have overgrown, with high fuel loads, ladder fuels and closed canopies. Many property owners in the area remain unaware of the risk of wildland fire, and place importance on dense forest landscapes bordering their private lands.

Reference Conditions, Patterns and Trends

Historically, frequent small intensity fires in ponderosa pine and mixed conifer ecotypes helped reduce fuel accumulations while maintaining structural diversity and minimizing tree densities. In the absence of ground litter, with more open canopy, grasses and forbs were also maintained, serving as important soil stabilizers and reducing the likelihood of crown fires. Although beetle populations are always around at endemic levels, increased tree densities, drought conditions, and old age class structures in forested areas have left areas more susceptible to insect and disease outbreaks.

Natural/ Human Causes of Change Between Current/ Reference Conditions

An increase in urban development in this area, with high accumulations of dead and dying materials in close proximity to area residences has

The desire for recreation homes amidst dense vegetation may provide privacy and a unique setting, but the close proximity of fuels and trees presents an extreme fire hazard in some areas.



increased risk for catastrophic wildfire addition, past wildfire suppression efforts have contributed to the large fuel loads on public lands.

3. Development and Effects to Ground Water & Summer Home Development

Current Conditions, Patterns and Trends

There are approximately 1,114 developed lots in the Ireland Meadows (36 lots), Meadow



The proximity of homes to critical riparian areas may increase sediment transport and introduce waste into area waters.

Lakes Estates (445 lots), Rainbow Meadows (90 lots), and Tommy Creek (194 lots) areas, all currently using septic tanks. As development continues to increase, impacts to groundwater may be a potential problem. Acceptable levels of coliform and nitrate levels are currently present, and the claron-limestone soils present from Duck Creek to Panguitch Lake are not suitable and conducive to septic system use

(sewered systems are more desirable). Currently, the Southwest District Health Department is sponsoring a water quality study to determine potential impacts of septic systems to groundwater, and to determine long-term impacts.

Dispersed recreation, in areas where few or no sanitary facilities exist, may also potentially impact groundwater. In addition, in the Deer Valley area, sporadic parking and increased recreational use on private lands are causing upland erosion and impacting area waters through increased sedimentation.

Reference Conditions, Patterns and Trends

Historically, most use of the watershed was intermittent/seasonal, with few year-round residents. Travel was limited to major roads, with little or no off-road

impacts. Timber roads were often left open, because they received little if any post-harvest use, and could act as migration corridors for wildlife. Impacts from septic systems, because so few existed, were not of concern in this area.

Water sources may be contaminated from improperly developed subdivisions.



Natural/ Human Causes of Change Between Current/Reference Conditions

The number of homes continues to increase, with many residents now residing year-round, greatly increasing the amount of waste disposal and water use. In addition, past users consisted of those seeking solitude which had very little impact on surrounding areas. Today, areas in and around Duck Creek and Navajo Lake are sought after by motorized recreation enthusiasts, increasing the number of user-created roads and reopening previously closed roads.

4. Development and Impacts to Adjacent Lands

Summer and year-round residents within the Mammoth Creek Watershed continue to increase. In addition, an overall increase in those seeking outdoor recreation, and the



As more and more recreationists traverse the watershed and Dixie National Forest, adjacent lands and water sources are impacted. The area around Mammoth Springs contains numerous dispersed camping sites and is constantly visited by tourists and area recreationists.

proximity of the watershed to established towns and national recreation areas, have magnified uses adjacent to Highway 143 and around developed recreation home areas. ATV use has also risen, with more off-road vehicles causing damage

to meadows, streams and wildlife habitats. Road densities currently exceed those recommended by the Dixie National Forest Land and Resource Management Plan (USFS, 1986) and vandalism of posted road signs in closed areas is a recurring and expensive problem. In addition, increased use of the watershed may pose potential water quality problems as well as increase habitat fragmentation for wildlife species within the area.

Reference Conditions, Patterns and Trends

Historically, most use of the watershed was intermittent/seasonal, with few year-round residents. Travel was limited to major roads, with little or no off-road impacts. Timber roads were often left open, because they received little if any post-harvest use, and could act as migration corridors for wildlife. Past use of the watershed consisted of those seeking solitude and having very little impact on surrounding areas.

Natural/ Human Causes of Change Between Current/Reference Conditions

The number of homes continues to increase with many residents now residing in the area year-round. Overall recreational use of forested areas has risen considerably over the past 20 years.

5. Enhancement or Protection of Goshawk Habitat

Current Conditions, Patterns and Trends

Six goshawk territories have been documented in the Mammoth Creek Watershed since 1992. Only one of these territories was active in 2002, although no more than three of these known territories have been simultaneously active in any given year during the last decade. Existing nesting habitat for northern goshawk appears to be adequate within the watershed. However, 50 percent of these known territories have experienced high levels of insect infestations within the nest stand since 1996. The resulting tree mortality has affected stand structure and its potential to support nesting habitat for the northern goshawk.

U. S. Forest Service and Division of Wildlife Resource Biologists monitor goshawks throughout much of the Upper Sevier River Basin.



U. S. Forest Service monitoring of goshawk territories over time indicates a downward trend in goshawk populations for the Dixie National Forest (Rodriguez, 2002).

Reference Conditions, Patterns and Trends

This species is associated with coniferous and mixed forests through much of the Northern hemisphere. Nesting habitat studies demonstrate that goshawk prefer to nest in older-aged forests with variable tree species. Nest sites are typically characterized by canopy closures greater than 60%, flatter slopes (<40%), and nest trees with diameters >8 inches. Prey abundance/availability and nest habitat are the primary limiting factors for goshawks (Rodriguez 2002).

Historically, insect and disease epidemics and catastrophic wildfire maintained vegetation diversity in the mixed conifer, aspen and ponderosa pine forest types. These natural phenomena created mosaics within the landscape and limited vegetation encroachment into meadow and riparian areas. These conditions helped support habitat for northern goshawks, as well as three-toed woodpeckers, peregrine falcons, and other wildlife species.

Natural/Human Causes of Change Between Reference/Current Conditions

Drought, cold and wet early spring conditions, low prey densities, significant wind events, fire, modified landscape vegetation (e.g. fire suppression and timber harvest), and predators all affect goshawk numbers (Rodriguez 2002). Current drought conditions and widespread insect infestations (e.g. spruce bark beetle, and pine beetle) are likely impacting local populations and their habitat on the Dixie National Forest, as well as conditions within the Mammoth Creek Watershed.

6. Enhancement and Protection of Riparian Habitat & Riparian Vegetation Composition



Extensive gully erosion occurs in portions of the Mammoth Creek Watershed.

Current Conditions, Patterns and Trends

Woody plant species and late seral herbaceous species are lacking along many riparian corridors, particularly along the Sevier River, near Hatch, Upper and Lower Mammoth Creek, Pass Creek and Limestone Creek. Where woody plant species (willow and cottonwood) are present, recruitment of young plants is limited and the majority of plants are in a mature stage. Bank erosion has resulted in higher width/depth ratios along many stream corridors and increased head cuts on the upstream ends. Recreation around riparian areas has increased in recent years, especially in the vicinity of summer and recreation homes. All-terrain vehicle use has also increased. Riparian areas are of critical importance to birds, fish, amphibians, aquatic invertebrates, and other

wildlife species. They provide critical breeding habitat for many southwestern neotropical birds, as well as water, shade, food, and shelter for other wildlife species.

Riparian areas also provide migratory routes for many bird species, as well as sheltered pathways to other habitats for other wildlife species.

Reference Conditions, Patterns and Trends

Riparian vegetation in the Mammoth Creek Watershed most likely consisted of mosaics of thick willows and late seral grasses. Cottonwood and willow communities were present at lower

Changes in vegetation composition and upland grazing have increased erosion into area waters. Steep cut banks and altered flow regimes are evident throughout the watershed.



elevations along the Sevier River. Expansive and diverse riparian grasses, along with willow and cottonwood, helped reduce sediment influx, maintained coarser stream substrate, contributed to cooler stream temperatures, and supported normal flow regimes.

Natural/Human Causes of Change Between Current/Reference Conditions

Changes in riparian vegetation have resulted from a variety of land uses including livestock grazing, channel adjustments, water diversions, road construction, recreation, and cropland cultivation. Intensive grazing pressure, particularly along lower Mammoth Creek and the Sevier River has resulted in higher width/depth ratios of streams. The failure of Hatch Town Dam in the mid-1900's left several feet of deposition material, causing increased channel erosion along the Sevier River.

7. Noxious Weeds

Current Conditions, Patterns and Trends

Noxious weeds pose an increasing threat to native ecosystems, croplands and other plant communities within the Mammoth Creek Watershed. An increase in recreational vehicle use and in-

creased traffic along Highway 143 and surrounding areas may accelerate the spread of noxious weeds. Recreational vehicles often act as weed vectors, transporting weeds great distances from their initial source,

More and more noxious weeds, like Canada Thistle, are being found along the Highway 143 corridor and within proximity to area waters.



and when once established, reduce forage production and compete with native plant and animal species for sunlight, moisture and nutrients. Noxious weeds located within water drainages are currently competing with native riparian vegetation.

Reference Conditions, Patterns and Trends

Historically, limited populations of noxious weeds occurred within the watershed. Infested livestock feed most likely introduced noxious weeds to the area; however, most populations remained small or were outcompeted by native vegetation. Noxious weed establishment on disturbed sites, such as in livestock, agricultural or mechanical treatment areas (chainings) was typically noted, but with limited dispersal.

Natural/Human Causes of Change Between Current/Reference Conditions

Currently, trails and roads serve as the single-most common point of noxious weed invasion, providing channels for weeds to migrate into more remote rangelands, agricultural and forested areas (USDAFS, 2002). Horses (if utilizing infected hay), ATV's and other motorized and nonmotorized vehicles traveling in recreation and roaded areas, act as vectors for noxious weeds, making wide-spread control difficult.

Movement by recreationists from watershed to watershed (possibly serving to increase noxious weeds) may

pose long-term problems for resource managers as well as area landowners.

High densities of small diameter ponderosa pine are present in many areas within the Mammoth Creek Watershed.



8. Ponderosa Pine – Fuel Conditions

Current Conditions, Patterns and Trends

Mixed-conifer is currently over-represented in areas throughout the Mammoth Creek Watershed and is displacing remaining populations of ponderosa pine and aspen. Ponderosa pine densities are high, with even age structures of small diameter trees. Many high-density ponderosa pine populations have been affected by large populations of bark beetles. An increase in mixed-conifer and high-density ponderosa pine around urban interface areas has left many of these areas at extreme risk to high severity wildfires. In addition, changes in vegetation structures have impacted wildlife, riparian areas, aspen

stands, meadows and sagebrush communities. Large diameter ponderosa pines, with accompanying large diameter snags, provide important hiding and thermal cover for numerous wildlife species as well as nesting habitat for some bird species. The risk of stand-replacement fires within the ponderosa pine community is also a concern.



Tall forb communities are known as the flower gardens of the mountains and provide habitat for a variety of wildlife.

Reference Conditions, Patterns and Trends

Periodic fires created uneven-aged stands comprised of small even-aged groups. Fire return intervals of 5 to 25 years, with low intensity surface fires, helped maintain a variety of structural stages

(PFC Assessment, 2000). Multi-age classes of different vegetation types were historically represented.

Natural/Human Causes of Change Between Current/Reference Conditions

Fire exclusion and livestock grazing (removing fine fuels) are the primary causes of change between current and reference conditions.

9. Tall Forbs – Vegetation Composition

Current Conditions, Patterns and Trends

Tall forb communities in association with forest and shrubland communities are valuable habitat for deer, elk, turkeys, eagles, owls and a variety of small birds, insects and small mammals. However, most of the tall forb plant communities within the Upper Sevier River Basin have been lost and few seed bases and necessary soil types remain. Isolated colonies of pollinating insects which are dependent on these communities are also at risk of disappearing. Reestablishment of tall forbs is considered a priority within the water-



Dead spruce are visible along much of the Highway 143 corridor, posing safety and fire hazards in high traffic areas.

shed, and currently, a 50-acre test area, adjacent to Cedar Breaks National Monument, has been established to test various restoration methods.

Reference Conditions, Patterns and Trends

Tall forb communities are considered the “flower gardens” of the mountains and were historically found throughout the mountains at or above

8,000 feet in elevation. A review of potential tall forb sites on July 30, 1997 indicated that between Navajo Lake and Sidney Valley there were approximately 6,000 acres that once supported tall forb communities (2000, Assessment).

Natural/Human Causes of Change Between Current/Reference Conditions

Fire may have played a role in maintaining tall forb communities by preventing conifers from encroaching into the parklands and meadows which are interspersed among conifer and aspen forests. Livestock grazing has removed many of the tall forb communities, contributing to soil loss and severe rill and gully erosion, with future site restoration in many areas difficult, if not impossible.

10. Spruce-Fir – Fuel Conditions

Current Conditions, Patterns and Trends

Spruce communities are currently being affected by a widespread spruce beetle outbreak. Approximately 90% of the trees are dead or dying, increasing fuel loads and placing

many areas at risk to catastrophic wildfire. An increase in spruce budworm has also been noted. With the current loss of spruce in this area, and increased mortality in the subalpine fir by root rot and insects, fuel loading may result in large, high severity, stand replacement fires. The Engelmann spruce-subalpine fir community (including aspen) provides habitat for large game species, such as mule deer and elk, as well as northern goshawk, blue grouse, woodpeckers and other neotropical birds and small mammals. Current stand compositions may negatively impact some populations of wildlife dependent on spruce-fir habitat..

Reference Conditions, Patterns and Trends

Historically, stands included both multi and single storied vegetation types, with mixed species composition. Most disturbances operated on a small scale, except for bark beetle outbreaks, which operated on a landscape scale, possibly every several hundred years, and were followed by high intensity wildfires. Mixed severity fires helped maintain vegetation mosaics and structural stages across the watershed.

**Natural/
Human
Causes of
Change
Between
Current/
Reference
Conditions**
Historic heavy grazing during Euro-American settlement, and subsequent fire

Agricultural lands in close proximity to wildlife habitats are often degraded during winter months and droughts or when range conditions are poor.



exclusion has changed vegetation patterns and processes especially in the drier communities. Fire exclusion in the mixed conifer type has resulted in an increase in Douglas fir and true firs and a decrease in aspen and ponderosa pine. Timber harvest activity has also occurred in parts of the mixed conifer type, leaving stands of mixed quality. Fire exclusion in spruce-fir since the 1850's has probably resulted in some change in patterns across the landscape with spruce-fir stands becoming more continuous instead of being broken up by patches of aspen.

11. Wildlife Management in Agricultural Areas

Current Conditions, Patterns and Trends

Wildlife damage to agricultural lands has increased steadily over the past decade. In the Mammoth Creek Watershed, depredation from elk is the primary concern; however, in some years deer are equally as likely to impact agriculture areas.

While mitigation measures such as landowner and control permits, fencing and actual dollar reimbursements offset some of the costs, wildlife continues to have an economic impact on private agricultural lands. Other concerns expressed from landowners include the impact to land development and use by the listing (endangered, threatened, etc.) of wildlife species such as Utah prairie dog and sage grouse, and the hesitation of landowners to engage in habitat improvement projects which may further attract wildlife and result in subsequent damage to private lands and cultivated area.

Reference Conditions, Patterns and Trends

Elk were eliminated from the watershed at the beginning of the 20th century, but were reintroduced in the 1980's. Unrestricted hunting of predators as well as hunting of big game, resolved most wildlife/landowner conflicts. Adequate winter and summer deer and elk ranges were maintained by periodic fire, further eliminating potential deer/elk conflicts.

Natural/Human Causes of Change Between Current/Reference Conditions

Restricted hunting, the demand for increased, quality hunting opportunities, stricter compliance with fish and game laws, and the desire for wildlife viewing opportunities have resulted in an increase in deer and elk numbers from early settlement conditions. Drought and subsequent changes in vegetation composition within the watershed may temporarily decrease elk and deer numbers; however, these same conditions may cause deer and elk to seek additional forage opportunities on private agriculture lands, where adequate feed is available. Competition for available forage from domestic livestock has decreased range conditions in some areas, further contributing to wildlife depredation on cultivated lands.

Mammoth Creek Key Issues Identified

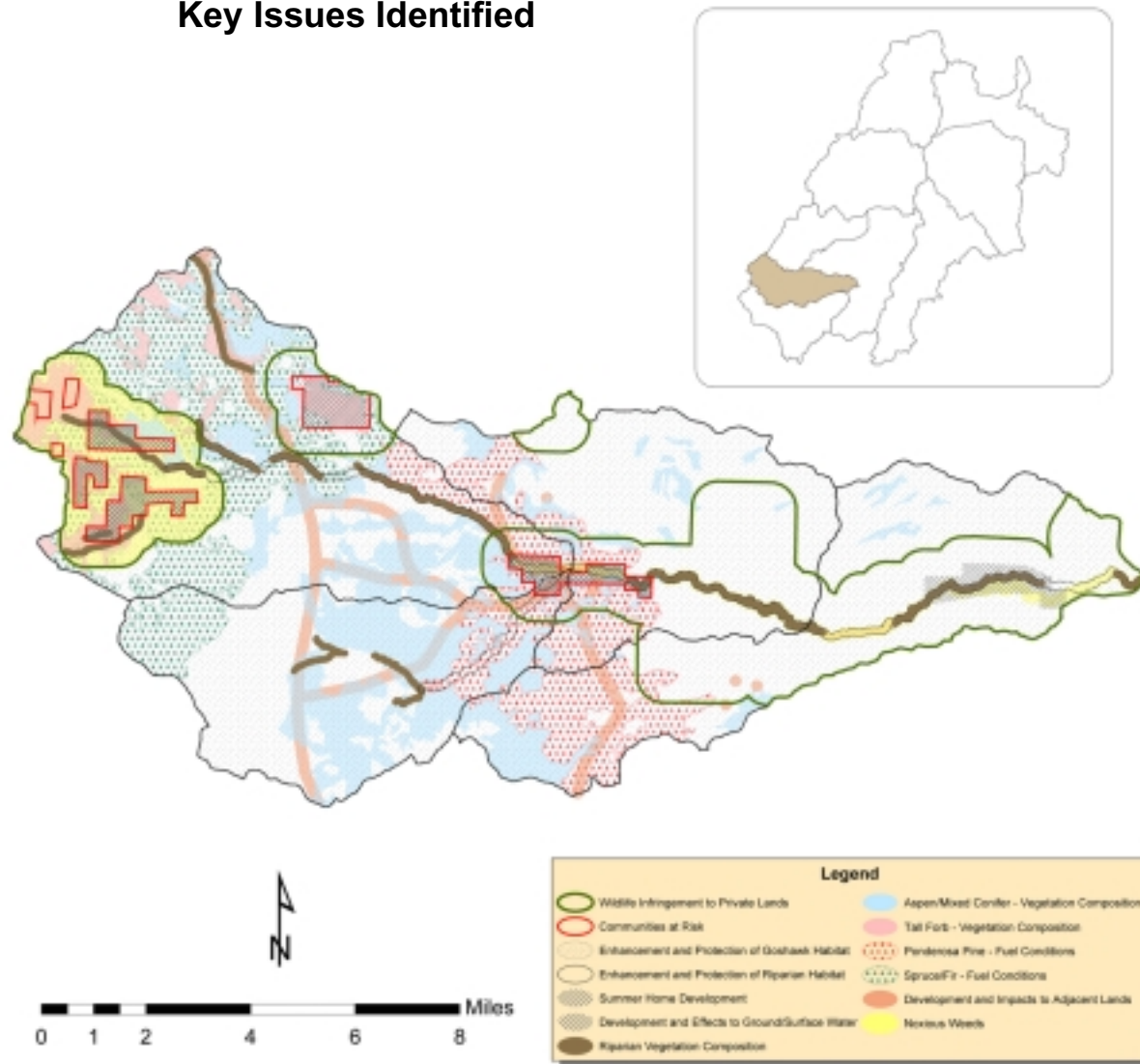


Fig. 4-11. The 13 key issues identified for the Mammoth Creek Watershed (described within the 11 Mammoth Creek Watershed narratives) represent input from agriculture, fire, human uses, hydrology, species and habitat, and vegetation technical advisory committees (TACs).

	Upper Mammoth Creek	Middle Mammoth Creek	Lower Mammoth Creek	Tommy Creek	Total for Mammoth Creek Watershed
Hydrology/Water Quality					
<i>Hydrology</i>					
Dewatering and altered flow regimes	H	NA	M	NA	L
Releases from Otter Ck. Res. may be causing bank erosion along E. Fork Sevier River	NA	NA	NA	NA	NA
Diversion of water from Castle Creek to Deer Creek has caused severe channel degradation	NA	NA	NA	NA	NA
Diversions along the Sevier R. may be affecting sediment transport capacity and channel equilibrium	NA	NA	NA	NA	NA
Loss of riparian veg. has resulted in reduced bank storage and summer streamflows	H	NA	M	NA	L
<i>Hillslope Processes</i>					
Accelerated erosion on high elevation meadows	H	H	NA	H	M
Accelerated erosion in pinyon-juniper and sagebrush stand	L	NA	H	H	M
Accelerated erosion associated with urban development	M	NA	L	H	L
Accelerated erosion associated with roads	H	H	M	M	M
Rill and gully erosion on hillslopes	NA	NA	M	NA	L
Accelerated erosion associated with illegal ATV use	H	L	NA	L	L
<i>Riparian Vegetation</i>					
Lack of health composition of riparian veg, defined by the presence of late seral herbaceous plants and multiple age class distribution of appropriate wood plant species	H	H	H	H	H
<i>Water Quality</i>					
Summer home development and associated impacts (i.e., groundwater contamination, erosion, recreation, etc.)	H	H	H	H	H
Accelerated erosion, grazing management, recreation use, roads	H	H	H	H	H
TMDL listed and potentially listed water bodies due to nutrients, sediment, phosphorous, DO, habitat alteration, or temperature	H	H	H	H	H
<i>Channel Morphology</i>					
Active channel adjustments (vertical or lateral)	M	H	H	M	M
Accelerated bank erosion	M	H	H	NA	M
Channelization	L	NA	L	NA	L
Agriculture					
Animal Feed Operations	NA	M	M	NA	L
Water conservation concerns (Sprinkler vs. Flood Irrigation)	NA	H	H	NA	M
Pasture Mgt.	NA	H	H	NA	M
Fertilizer Usage and Impacts	NA	H	H	NA	M
Noxious Weeds	NA	H	H	NA	M
Wildlife Infringement on Private Lands	M	H	H	NA	H

Table 4-6. Issue ratings for all four Mammoth Creek subwatersheds, as identified by technical advisory committees (TACs). Issues highlighted in blue are addressed in detail in this section.

	Upper Mammoth Creek	Middle Mammoth Creek	Lower Mammoth Creek	Tommy Creek	Total for Mammoth Creek Watershed
Fire					
Communities at Risk	H	H	M	H	H
Fuel Conditions	H	H	M	H	H
Human Uses					
Development and Effects to Ground/surface water	H	H	M	M	H
Development and Impacts to adjacent lands	H	H	M	M	H
Access Management	M	M	M	M	M
Developed and Dispersed Recreation	H	H	M	M	H
Vegetation					
Sagebrush - Grass	L	H	H	L	M
Aspen	H	M	M	H	H
Grassland - Meadow	M	M	L	L	M
Mixed Conifer - Mountain Fir	M	M	M	H	H
Oak - Mahogany - Mountain Shrub	NA	L	L	NA	L
Pinyon - Juniper	NA	L	M	NA	L
Ponderosa	M	M	M	M	M
Spruce - Fir	M	NA	NA	L	L
Tall Forb	H	NA	NA	NA	L
Noxious Weeds	NA	H	H	NA	M
Species and Habitat					
<i>Priorities for Enhancement or Protection of:</i>					
Southwestern Willow Flycatcher Habitat	NA	NA	NA	NA	NA
Utah Prairie Dog Habitat	NA	M	H	NA	M
Bald Eagle Habitat	L	L	M	L	M
Spotted Bat Habitat	L	M	M	M	M
Townsend's Big-eared Bat Habitat	M	H	H	M	H
Flammulated Owl Habitat	M	H	H	M	H
Three-toed Woodpecker Habitat	H	M	M	H	H
Northern Goshawk Habitat	H	H	H	H	H
Peregrine Falcon Habitat	H	M	M	M	H
Sage Grouse Habitat	NA	L	M	NA	L
Turkey Habitat	M	H	H	M	H
Deer Habitat	M	H	H	H	H
Elk Habitat	M	H	M	H	H
Pronghorn Habitat	NA	M	L	NA	L
Brian Head Mountain-Snail Habitat	M	NA	NA	L	L
Beaver Habitat	H	M	M	M	H
Boreal Toad Habitat	L	L	NA	L	L
Bonneville Cutthroat Habitat	NA	NA	NA	NA	NA
Riparian Areas	H	H	H	M	H
Fisheries Habitat	M	H	H	M	H

Table 4-6(con't). Issue ratings for all four Mammoth Creek subwatersheds, as identified by technical advisory committees (TACs). Issues highlighted in blue are addressed in detail in this section.

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