

activities pose a risk. Cultural resources would be better protected by providing designated dispersed camping and fishing areas because the cultural sites would be avoided. Prohibition of parking in undesignated areas would protect cultural sites from vehicular damage.

New trails that direct public use would protect cultural sites by avoiding them. Rehabilitation, relocation, or elimination of user-created trails and prohibiting off-road driving would generally reduce impacts and/or protect cultural sites. However, opening new areas may negatively affect cultural resources through associated user activities.

Allowing forest and fuels management activities to occur in the corridor where consistent with protecting river values would help reduce soil erosion and the threat of catastrophic fire, which would protect cultural sites.

The limited livestock use in this area would not adversely impact cultural resources.

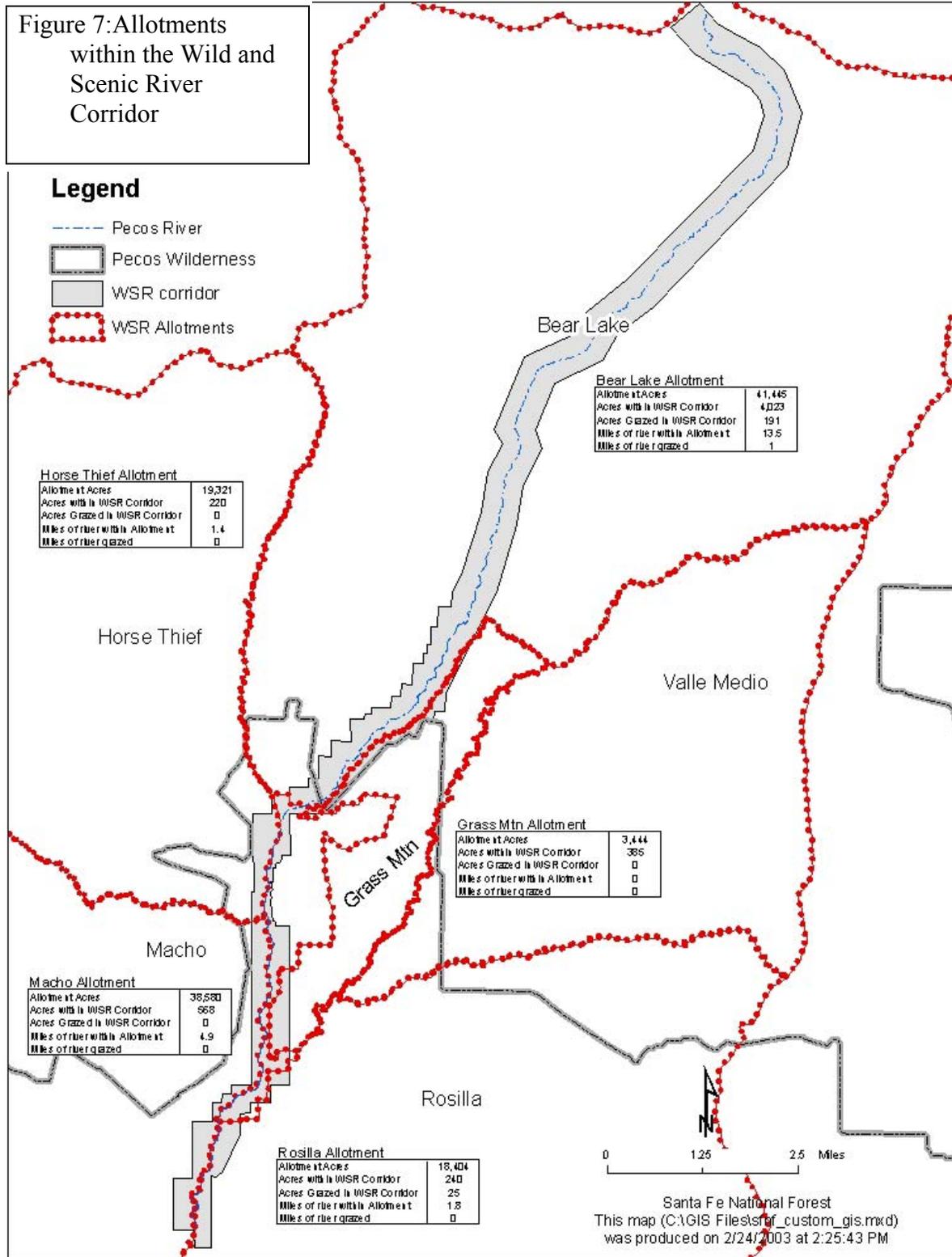
#### Alternative 1

Closing riparian areas to camping and off-road vehicle use would protect heritage resource sites located in those areas. Since management of the rest of the corridor would not change, the risks to heritage resources would be the same as described in the Proposed Action.

Under the No Grazing Option, eliminating grazing would avoid completely the risk of damage by cattle.

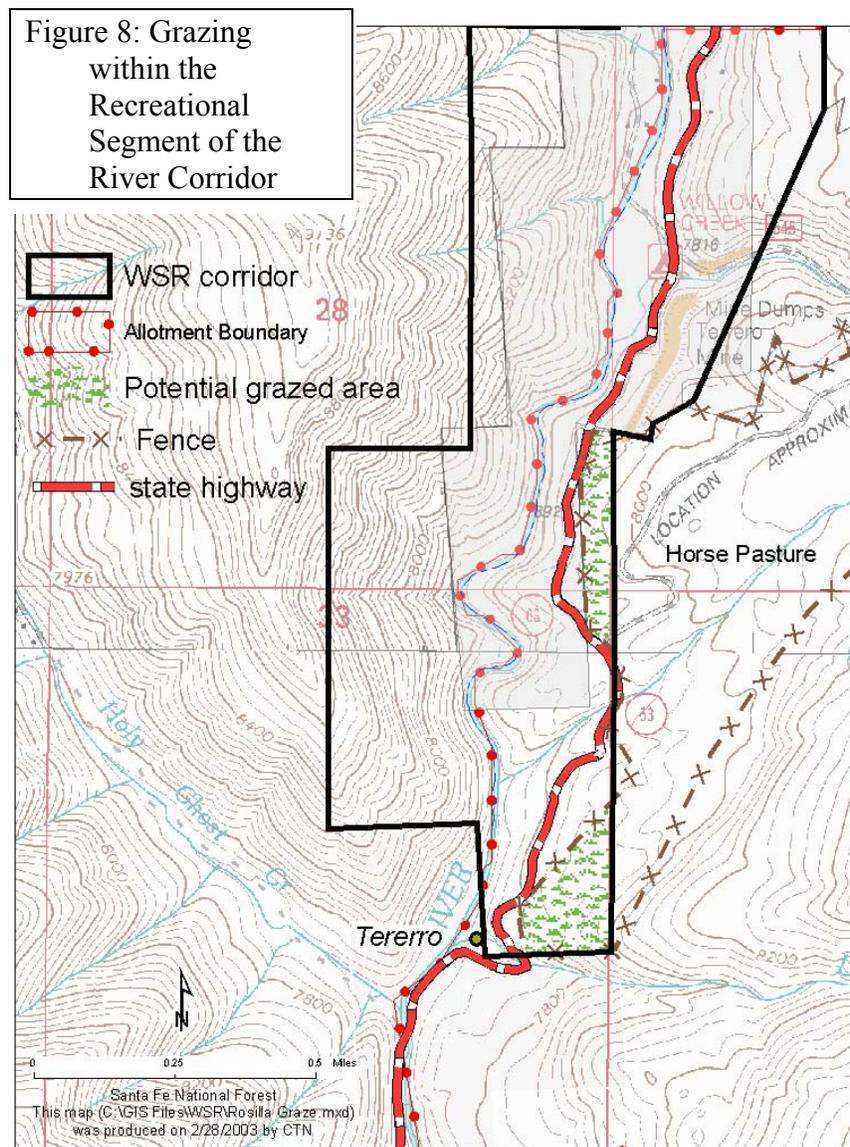
### **3.8 Livestock Grazing – Affected Environment**

Grazing by domestic livestock differs greatly between the Recreational and Wild segments. In the distant past, grazing by cattle, sheep, and horses was widespread and quite heavy in both segments and may have been, at times, the dominant use of parts of corridor. Today, grazing in both segments is very light.



Grazing in the Recreational segment: In the past, grazing of cattle, sheep, horses, and goats in the riparian and uplands from Panchuela to Terrero was common.

Today, the Recreational segment of the corridor passes through small portions of three active grazing allotments: Grass Mountain, Macho, and Rosilla (see Figures 7 & 8). Though the Grass Mountain and Macho allotments are in the corridor, livestock grazing does not occur on public land. Further, grazing in the Rosilla allotment is also nearly non-existent. A fence along the highway between Terrero and Willow Creek effectively excludes livestock from grazing the riparian area on federal lands in this segment. Some light to moderate grazing does occur on approximately 25 acres in the uplands on the east side of the highway fence. This part of the Rosilla allotment is used primarily as a horse pasture for the Terrero Riding Stables.



Grazing in the Wild segment: During the late 19<sup>th</sup> century, Beatty's Flats was used as a collection point for livestock, and historically had the highest number of cattle and greatest use of forage. Today, much less grazing occurs.

The Bear Lake Allotment consists of approximately 41,450 acres, with 10,000 acres classified as full capacity range (1995 EA of the Bear Lake Grazing Allotment Re-issuance, Project Record #24). Full capacity range is the area of an allotment that can be grazed, under proper management, without long-term damage to the soil or plant community. Less than 5% of the full capacity range of the Bear Lake Allotment is found within the corridor.

The Wild segment bisects the Bear Lake Allotment (see Figure 7) where fifteen permittees are authorized to graze 563 head of cattle from July 1 to September 30. Permittees are assigned to specific areas within the allotment, and individuals or groups of permittees graze their cattle in that area for a season or part of a season. Grazing therefore occurs in dispersed areas throughout the season. Allotment Management Plans and Annual Operating Instructions (AOI) provide additional direction on livestock grazing to permittees. For example, the permittees are required to hire a herder who keeps cattle out of sensitive and closed areas, preventing concentrated impacts around water sources or in riparian areas. Each year, the AOI specifies areas cattle should use and which areas should be avoided.

Key Areas are established jointly by the Forest Service and permittees to monitor the amount of grazing that occurs. They reflect what is happening on larger areas as a result of on-the-ground management actions by measuring the effects of livestock herbivory and use. One of the Key Areas for the Bear Lake Allotment is located within the corridor, between Pecos Falls and the Larkspur Fence.

The Wild segment has four distinct areas that differ in terms of capacity and use:

Jacks Creek to Beatty's Creek: Grazing within this reach, over seven miles long, is virtually non-existent. Only extremely limited forage exists in small, upland patches. The canyon's steep walls prevent cattle from reaching the river's edge.

Beatty's Creek to Pecos Falls: Within this reach, about 4 miles long, grazing only occurs in a few upland areas and a short stretch just below the falls. Most of the east side of the river is steep and densely covered with trees. The west side of the river is fenced from the mouth of Beatty's Creek upstream 0.6 miles. This fence runs across Trail 260 (from Hamilton Mesa and Bob Grounds) and across Trail 24 north of Beatty's Flats and near the mouth of Rito del Padre, keeping cattle out of Beatty's Flats and away from riparian zones. The herder also keeps cattle out of this area. Occasionally, cattle do get into Beatty's Flats and are relocated elsewhere at the first opportunity. As a result of the fence and the herder, livestock use in this area is usually very light. The only area grazed within this reach is on the west side of the river, an upland area characterized by small patches of steep, grassy slopes and aspen groves. The canyon's steep walls prevent cattle from reaching the western side of the river's edge.



**Steep slopes dominate the grassland areas within the corridor**

In the grazed uplands, the herder monitors use so that it does not exceed the 40% average prescribed in the AOI. The last full range condition analysis (1981) showed the grasslands in this segment to be in fair to good condition. Since that time, range inspections made by Forest Service personnel indicate that conditions remain in fair to good condition, indicating a stable trend. The inspections show that combined use by cattle, elk and recreational horses were within the 40% standard.

Pecos Falls to Larkspur Fence: This reach contains another one of the allotment's key areas.

This section (about 2 miles) receives the highest level of grazing in both the Recreational and Wild segments. Even so, the use is conservative. Distance from the Falls north to the Larkspur fence is less than 2 miles. Most of the east side of the river consists of spruce /fir forest. The west side consists of open grasslands having moderate to steep slopes. Grazing typically occurs early in the season when cattle are being moved to the Jarosa area, and again in the fall as they return. Cattle are grazed on just over 100 acres in this reach.

Cattle occasionally graze along the banks of the river; a herder prevents them from over-utilizing the riparian area. The herder also monitors the use so that it does not exceed the 40% average prescribed in the AOI. The last full range condition analysis (1981) showed the grasslands in this segment to be in fair to good condition. Since that time, range inspections made by Forest Service personnel indicate that conditions have remained in fair to good condition, indicating a stable trend. The forage is a mix of bluegrass and bunchgrasses. Since elk, cattle, and horses prefer the bluegrass, it is used more than the bunchgrasses. Range monitoring (see photos) in July of 2002 confirmed that use did not exceed 40% even during a prolonged and extreme drought.



**No loss of vegetation is observed in the grazed area (July 2002)**

The riparian zone along the river consists primarily of wet meadows dominated by sedges. Willows, including the Arizona willow, are common along the river. Atwood's inventory in the Pecos Wilderness describes the Arizona willow population in the corridor as being in good to excellent condition, stating, "The extensiveness of this population is impressive." Since growth and reproduction of the Arizona willow is severely hampered by grazing animals (Maschinski 2001), the presence of a large population in good condition is an indication of proper grazing use on this and other riparian species within this area. For a variety of reasons, the permittees are instructed to minimize use the use of this area. Stream banks in this section are stable with good vegetative cover.

Larkspur Fence to Pecos headwaters:  
Though this area (almost 2 miles long) contains full and potential capacity rangelands, cattle are restricted from this area by fences.

Allotment Summary:  
The acres grazed are a very small portion of the total allotment. Three recent studies addressed stream health and water quality of the upper Pecos River.



The uplands between Pecos Falls and larkspur fence (July 2002)

(Muldavin 1993) noted the stability of the banks and lack of sediment in the stream. Similar results were found in the 1995 stream survey, which showed that the sediment loads in this stream are very low, less than 5%. Finally, the 1996 survey for the Arizona willow found large, healthy populations of this sensitive plant species along the upper Pecos River (Atwood). Results from all three studies indicate a very stable stream system with healthy vegetation where the Bear Lake Allotment overlaps the WSR corridor.

**Table 5 – Grazed verses total acres by reach**

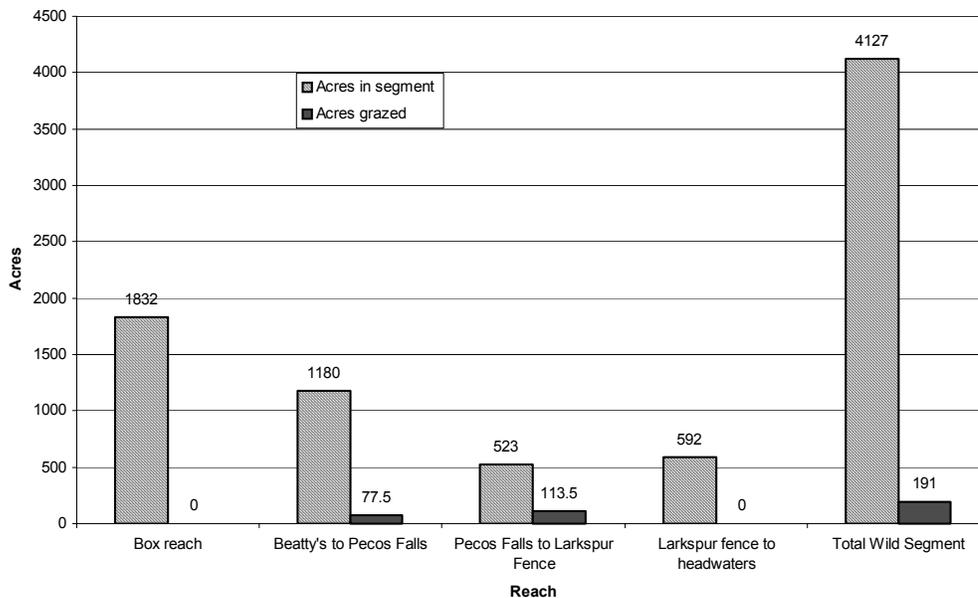
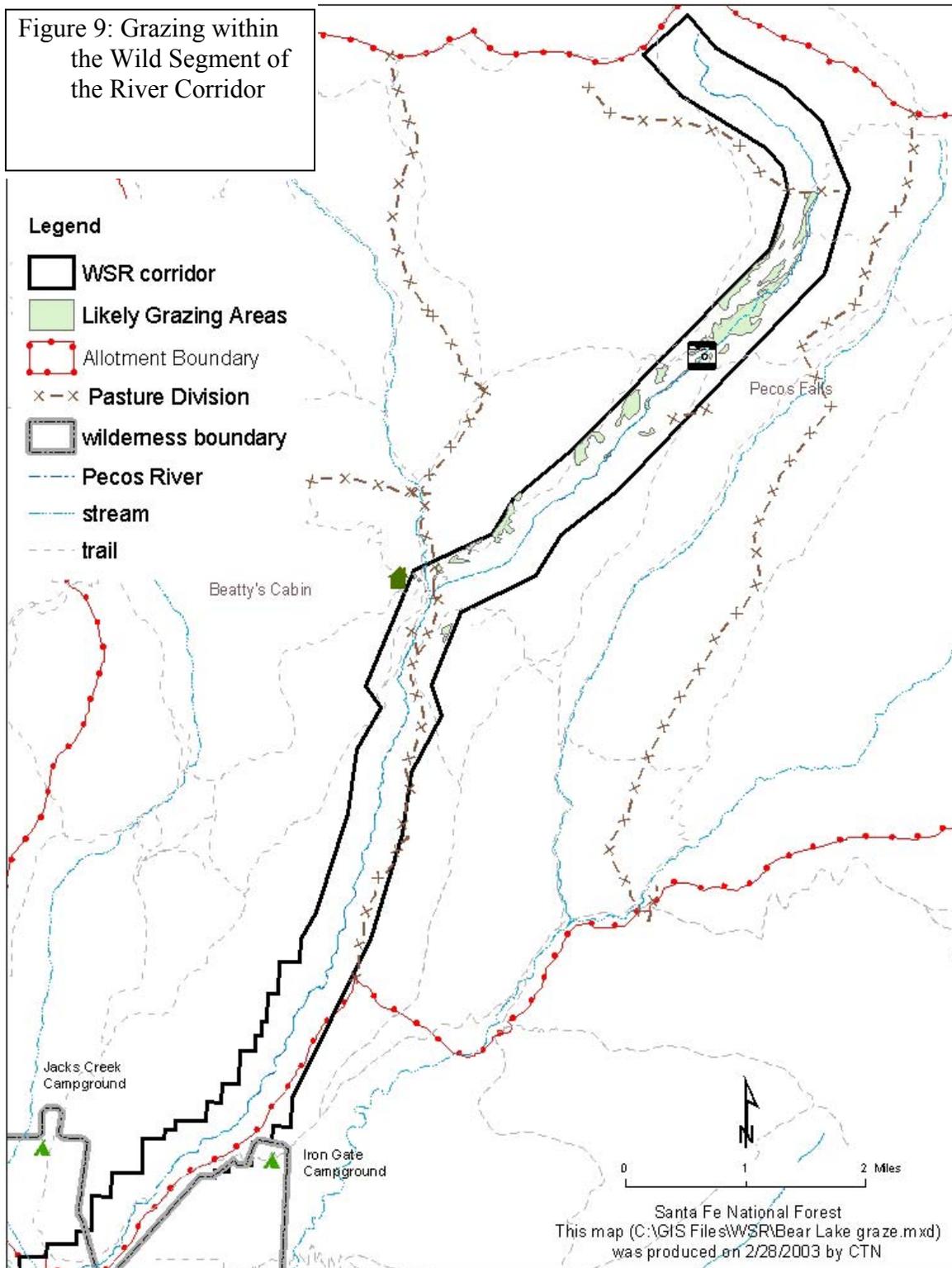


Figure 9: Grazing within  
the Wild Segment of  
the River Corridor



## **Grazing - Social Aspects - Affected Environment**

Mitchell, Wallace, and Wells (1996) conducted a study on visitor perceptions about cattle grazing on National Forest Lands. The study found that 34% of visitors indicated livestock added to their stay while 33% found their presence to be negative. When asked open-ended questions about whether anything interfered with their stay, 50% said nothing and 9% mentioned livestock. In the same survey, when asked about environmental impacts, 70% did not notice any, 21% noticed human impacts (litter, people, ATVs), and 9% mentioned livestock (Mitchell, Wallace, Wells, 1996).

Another study on visitor perceptions of livestock grazing in Wilderness areas was conducted in 1997. When asked open-ended questions about whether anything interfered with their visit, 38% said nothing. Of the remaining, more people indicated interference from other visitors (18% noted crowding, litter, and inappropriate behavior) than livestock (15% noted direct encounters and manure). When asked specifically about grazing, 43% of visitors accepted livestock grazing in Wilderness and 40% found it unacceptable (17% held no position on the matter). Wilderness visitors indicated they were more tolerant of grazing on non-Wilderness public lands if managed to protect ecosystems (Johnson, Wallace, Mitchell, 1997).

Neither of these studies was done on the Santa Fe National Forest, so it is not possible to extrapolate the results to the WSR corridor. Yet, there is no reason to believe local recreationists have markedly different views and values than those found in the studies since both show the perceptions held by a cross-section of actual National Forest recreationists about cattle management.

## **Livestock Grazing - Environmental Consequences**

### All Alternatives, including No Action

There would be no noticeable change in existing conditions or overall management of livestock grazing. Very little grazing would continue to occur, and there would be no long-term impairments of water quality or river values associated with livestock grazing. The effects of cattle grazing would be extremely limited in context and intensity.

Utilization standards would continue to be met, with monitoring occurring in key use areas within ¼-1 mile of water, and cattle distribution controlled by the herder, as required by Forest Plan (pp. 127 and Appendix D p. 10-12). The Forest Plan would continue to require: utilizing level B management (ie very limited grazing); keeping capacity and use in balance or making adjustments in permitted numbers; avoiding concentrations of livestock in sensitive areas such as riparian zones, etc. With continued compliance of the grazing management standards, the effects of grazing on other resources, such as water and riparian resources, would be maintained or improved from their current conditions. The detailed effects to these resources are discussed in other sections of this EA.

### No Grazing Option

The effects of eliminating grazing on water quality, riparian conditions and range condition would not be much different than the existing conditions within the corridor because hardly any cattle graze in the WSR corridor. A number of studies on riparian and water quality indicators (see those sections in this EA for detailed effects) show no degradation of WSR values from cattle grazing. In fact, the conditions on the grazed portions of the Pecos River would be the desired conditions for other river systems. Implementing a No Grazing Option would not change this to any measurable degree.

Prohibiting grazing within the corridor would reduce the amount of full capacity range on the allotment by approximately 5%. This would also eliminate a few sites where the cattle get water. It would make management of the herd much more difficult, if not impossible, without additional fencing or riders. This would affect permittees by possibly limiting their ability to run cattle on the Bear Lake Allotment.

Recreational users of the corridor would not notice a marked difference if cattle were prohibited from the corridor because livestock are permitted in the Wilderness lands surrounding the corridor.

A large number of comments have been received during the development of this plan. Of over two hundred comments, only a few have suggested eliminating livestock from the corridor. This may be due to a number of factors including: 1) livestock, including cattle and horses, have been present in the Wild segment long before the river was designated as a WSR, 2) livestock grazing is a current use compatible with the Wilderness Act, and/or 3) in the area of the corridor where cattle are likely to be seen, horses are the main conveyance. The current level of livestock use appears to be compatible with recreational use in the Corridor.

## **3.9 Lands and Special Uses – Affected Environment**

### Jurisdiction and Ownership of Land

Jurisdiction over land in the Recreational segment is shared between the Forest Service (71.3%), the State (21%), and private parties (7.7%). Because few boundary fences and signs exist, the delineation of ownership is often indistinguishable on the ground; visitors cannot discern the difference between private land, NMG&F land, and National Forest System lands.

Differences in management between the Forest Service and State are a problem. For recreational sites, the level of maintenance, fees, and amount and quality of facilities varies between National Forest System and State lands. Visitors have expressed confusion about these differences. The Forest Service has cooperative agreements with the State that allow the Forest Service to enforce laws on State land; however, the applicable laws differ so that the same illegal activity may be cited differently according to whether it occurs on federal or state land. The Forest Service also has a cooperative agreement with the state allowing the Forest Service to respond to wildfires on State land.

Because State and federal fire restrictions are set independently, inconsistencies in forest closures and campfire restrictions can exist.

The agencies have discussed the acquisition of NMG&F recreational areas within the corridor by the Forest Service through exchange or acquisition. It is uncertain at this time whether such an exchange or acquisition will occur. In the meantime, NMG&F installed barriers in and around the dispersed sites near the Mora campground to improve the riparian conditions by keeping vehicles away from the river. This has been effective in preventing vehicles from driving and parking along the river, though people still carry their gear over the railing and camp on the river bank.

There are 136 acres of private land within the corridor; most are undeveloped and may be subject to further subdivision and development. The most extensive privately held river frontage, extending for approximately 0.2 miles, is just north of Willow Creek. San Miguel County regulations govern development of private land. The Comprehensive Land Use Plan adopted in 1986 by the San Miguel County Commission contains a general prohibition against development within a floodplain, although it does allow buildings or structures to be "located adjacent to a floodplain when the finished surface of the ground is higher than, (sic) or is raised by filling to an elevation of at least two feet above the elevation of the floodplains." Other parcels in this vicinity include the Los Pinos Guest Ranch, located on the road to Panchuela campground. This parcel has a small amount of frontage on the river. Residential development on private lands in the corridor can detract from the river values and water quality. Thus, the Forest Service coordinates with the County about new County regulations addressing lot size, building setbacks, types of uses, and septic systems along the river in order to protect water quality and river values.

The largest subdivision in the area is the Pecos Canyon Estates, located uphill of the main road and not within the designated corridor. The houses within this subdivision are subject to the County's land use plan.

In 1976, the Forest Service purchased a 299-acre tract owned by Cowles Corporation in the upper Pecos River valley. The property contained a lodge, various cabins, and storage buildings. All of the structures were removed except for 25 cabins on 24 recreational residence lease lots. Cowles Corporation issued the leases between 1950 and 1976, mostly written as 99-year leases with the majority of expiration dates falling between 2048 and 2058. Lot size varies from slightly less than an acre to nearly three acres. The federal government made this purchase with the objective of enhancing public enjoyment of the upper Pecos River area. The justification statement prepared as part of the Land and Water Conservation Fund acquisition process indicates this intent:

*“Acquisition of this property will provide unrestricted fishing opportunities to the public for over 2 miles of stream. Availability of the developable acreage will afford opportunities for the construction of recreation facilities sometime in the future. The immediate advantage of this purchase is that streamside lands will be restored to their natural state to enhance dispersed recreation, water quality, streamside vegetation, and wildlife, all of which contribute to the recreation experience of the Forest user.”*



**A Cowles lease cabin**

Two leases recently expired, and the cabins on these lots have been removed. A number of additional leases will expire in the next decade. The lease lots are managed under the terms and conditions of the original leases, in addition to guidelines provided by the Forest Service for improved protection of water quality and river values. Several lots were landscaped with lawns or other non-native vegetation that resulted in a loss of riparian vegetation. Most of the lease lots are occupied during the summer months, and there are 9 cabins within the floodplain of the WSR (Project Record #68). While public access and use of the river is not legally prohibited on these lots, the existence and occupancy of the cabins does detract from public recreational opportunities along the river.

Where two cabins were built on a single lease lot, one of the cabins was converted to a special use permit since the leases do not allow for more than one cabin per lot. There is also one other cabin in the corridor under special use permit as an “isolated cabin”.

## Minerals and Special Uses

The amendment of the WSR Act to include the Pecos River withdrew federal lands in the corridor from the establishment of new mining claims, and prohibited mining activities subject to valid existing rights. All 141 mining claims that existed prior to designation of the Pecos WSR have expired, and there are no valid claims or active mines existing in the corridor.

The Terrero Mine is no longer operable (see cultural resources section of this EA for details about the mine's history). However, toxic contaminants, including cadmium, copper, zinc, aluminum, mercury, and lead, were produced as a result of the mining. Unprocessed waste from the Terrero Mine used in campground and road construction projects in the corridor are now under-going hazardous waste remediation. Affected public recreation sites were closed to avoid potential contamination during the remediation. The Forest Service, State, the U.S. Environmental Protection Agency, AMAX Corporation and later Phelps Dodge (the mining company with mineral rights at Terrero Mine) have been involved in the hazardous waste clean up, which is expected to be completed in 2004.

The WSR corridor has few commercial uses or opportunities for commercial uses. There are at least 20 outfitter/guides that, at some time during their operations, may cross through the corridor. The majority only spends a small portion of their time within the corridor. Just five use the river as a destination.

Also under special use permit are a number of utility corridors within the WSR corridor. These provide power and phone service up the main canyon to Jacks Creek, Grass Mountain, Winsor and Panchuela canyons. These are low voltage overhead lines with inter-visible poles. The utility corridors are periodically maintained through brush and snag removal.

## **Lands, Minerals and Special Uses - Environmental Consequences**

Under the No Action Alternative, there would be no change from the existing condition just described.

### All Action Alternatives

Under all action alternatives, individuals or businesses may have a harder time obtaining new special use permits because activities must not conflict with river values or impair water quality. However, this policy has been informally in place since the river was designated as WSR, so little change is anticipated.

### **3.10 Other Social and Economic – Affected Environment**

Other sections of this EA described both commercial and non-commercial social uses of the corridor, including hunting, fishing, livestock grazing, and residential land uses. There are also local businesses in Pecos that profit from visitors and outfitter guides who purchase supplies, meals, gasoline and equipment. While the merchants also serve the

communities of Pecos, Glorieta, and Rowe, some of their annual income comes from tourism in the upper Pecos canyon.

### **Other Social and Economic - Environmental Consequences**

None of the alternatives would have any noticeable effects to social or economic conditions and trends in the corridor. The action alternatives would slightly alter the types of uses and visitors in the corridor; however, they would not affect the number of visitors to the WSR corridor even if they re-direct recreationists to different areas. The relevant social and economic effects regarding recreational uses, livestock grazing and other land uses are described in previous sections. None of the action alternatives would disproportionately impact minority or low-income populations because the social and economic changes would be negligible to begin with.

### **3.11 Water and Riparian – Affected Environment**

#### Free Flowing Water

The Wild segment is free of modifications. The Recreational segment has minor modifications that existed when the river was designated: the Cowles ponds, riprap, highway crossing, and other road bridge crossings. In addition, two small structures divert water from the Pecos River or tributaries into irrigation ditches. For example, water is diverted from the Pecos River into irrigation ditches and a small pond on private land just north of Terrero. These diversions are considered insignificant with respect to the overall hydrological regime of the river (Muldavin 1993).

#### Instream Flow

Section 13(c) of the WSR Act requires the protection of water flows in a designated river. This non-consumptive, non-reserved water right is called instream flow. It is extremely difficult for the government to claim an instream flow right in New Mexico because of state law. The law specifically requires a physical diversion structure in order to perfect a water right. Nonetheless, the government will continue to seek a decreed reserve water right for instream flow under the WSR Act. Even without a decreed reserve right, instream flows should be sufficient to protect the aquatic and riparian ecosystems. This is an unintended result of the Pecos River Compact. This compact makes it impossible to make an additional claim for the waters of the Pecos River and requires the water to be allowed to flow in the river downstream to Texas.

#### Water Quality

The State of New Mexico Water Quality Control Commission instituted the “Water Quality Standards for Interstate and Intrastate Streams in New Mexico” in an effort to preserve the quality of the streams in the state. The standards are consistent with Section 101(a)(2) of the Federal Clean Water Act (33 U.S.C. 1251 et seq.). The report lists the designated uses of the upper Pecos River and its tributaries (from Pecos National Historic Park to its headwaters) as: domestic water supply, fish culture, high quality cold water fishery, irrigation, livestock watering, wildlife habitat, and secondary contact. The entire

Pecos River fully supports its designated uses, meaning the water quality is in good to excellent condition.

The only exception to the outstanding water quality occurs in a reach of Willow Creek where it encounters the abandoned Terrero Mine, less than a 1/2-mile upstream from where it joins the Pecos River. This short section of the river between Willow Creek and Terrero only partially supports the designated use of high quality cold-water fishery due to turbidity from the mine. Nonetheless, it remains healthy and highly productive for most of its length according to the latest NMED report. With the remediation of the mine nearing completion, the water quality in this section of Willow Creek will improve. (McLemore et al 2001) found elevated concentrations of some metals below the Terrero Mine, but not enough to significantly affect the composition of the water in the area.

Although water quality in the Pecos River is very good, there are several sources of sediment, the most noticeable being the heavily-used recreation sites on State lands in the Recreational segment. Other sediment contributions come from road runoff and areas burned in catastrophic fires. The 2002 Trampas Fire burned about 4,300 acres in the Mora River watershed. The Mora joins the Pecos above Cowles at the Mora Campground. The influx of sediment and ash through the Mora and into the Pecos was heaviest immediately after the fire and continued into this year. These effects are expected to become undetectable within the next few years (personal communication with Steve McWilliams, Forest Hydrologist).

Four studies have been done to assess stream health and water quality of the Pecos River north of the village of Pecos. These studies were completed in 1993, 1995, 1998 and 2002 respectively. An instream flow study noted the stability of the banks and lack of sediment in the stream (Muldavin 1993). The 1995 study of water quality on the upper Pecos River in the Bear Lake Allotment showed that the sediment loads in this stream are very low, less than 5% (Johnson & Sims 1995), well within natural levels. Riparian vegetation in the Wilderness is in excellent condition as well. In 1998, Atwood conducted a survey for the Arizona willow and found large, healthy populations of this sensitive plant species along the upper Pecos River (Atwood 1998). The results of the Proper Functioning Condition survey indicated that the riparian condition above the falls is excellent (Gatton 2002). Results from all these studies indicate a very stable stream system with healthy vegetation.

Based on the studies above and observations by resource professionals, conditions along the upper Pecos River are good and river values are being protected.

#### Riparian Condition

The Pecos River is lined along most of its length by a 30 to 100 foot band of forest and shrubland dominated by riparian species. Wetlands are relatively small in extent and uncommon along the river. With respect to the U.S. Fish and Wildlife Service's National Wetlands Classification, the communities along the river would be respectively classified as Palustrine Forested, Palustrine Scrub-Shrub, and Palustrine Persistent Emergent Wetlands, respectively (Cowardin et al. 1979). The New Mexico Natural Heritage

Program statewide classification would place these communities within the Montane Riparian Forest, Woodlands and Shrublands, and as Herbaceous Wetlands.

The riparian condition is satisfactory along the entire corridor, with conditions improving as one travels upstream from Terrero. Some short stretches of the Recreational segment where dispersed camping, off-road driving, and user-created trails exist show signs of degradation. This damage is evident at areas north and south of the Mora campground as well as near the Cowles ponds.

In the Wild segment, the riparian conditions are good to excellent. The vegetation is flourishing and stream banks are heavily covered with grasses and willows. The riparian areas are generally inaccessible to people and cattle, other than near Pecos Falls and Beatty's Flats. In these two areas, some loss of riparian vegetation occurred as a result of heavy recreational uses in the past. Near Beatty's, user-created trails and camping damaged the riparian vegetation, although the extent of this damage is confined to a small, localized area. Just below Pecos Falls, a user-created trail to the base of the falls has resulted in the loss of vegetative cover on banks. The trail and denuded stream bank have contributed sediment to the river.

Just above the falls is another site of localized damage, where a natural low water crossing (where the river is slower and wider) used by backpackers, equestrians, cattle, and elk exists. At the crossing itself, the only riparian species present are willows, which show high vigor and some light browse. No sedges or rushes are on the stream banks. Silt deposition is high because the trail crosses laterally and creates a wider, shallower stream. The sedimentation from this crossing extends approximately 50 feet below the impacted area. Immediately above and below the trail, the riparian vegetation is in good condition.



### **Water and Riparian – Environmental Consequences**

Under the No Action Alternative, there would be no change from the existing condition just described.

### All Action Alternatives

Under all the action alternatives, water quality is expected to continue meeting State standards. Water quality would actually improve because controlling dispersed camping and parking, off-road driving, and user-created trails adjacent to the river would result in less sedimentation. Experience from many other Forest Service projects shows that closed areas have more vegetation, less soil compaction, less erosion, and less sedimentation to the stream.

In the Wild segment, riparian conditions would remain satisfactory. The small, localized areas of riparian damage are not likely to expand, especially with the closure of Beatty's Flats and Pecos Falls to camping.

Under Alternative 1, water quality and riparian conditions would compare to that of the No Action alternative because it would not close very many areas to damaging recreational uses. Under Alternative 2, water quality and riparian conditions would improve the most because it has the most restrictions on camping, parking, and off-road driving.

For all the action alternatives, the ever-increasing density of trees poses a threat of high-severity crown fire. Allowing harvesting and prescribed burning would help avoid the kind of impacts to water quality following the 2000 Viveash Fire and 2002 Trampas Fire. While thinning and burning projects may result in short-term inputs of sediment and reduction in water quality, they have been found to protect watershed resources over the long-term to a far greater degree.

Under the No Grazing Option, there would be no detectable difference in water or riparian conditions, since cattle rarely use the corridor. Cattle graze only about 5%, or 190 acres, of the Wild segment. In addition, cattle herds, which are split into smaller groups, may rotate through the allotment for less than 4 months. A review of the water quality studies and assessments previously discussed indicates that livestock grazing is not creating measurable or detrimental impacts to the riparian vegetation or water quality.

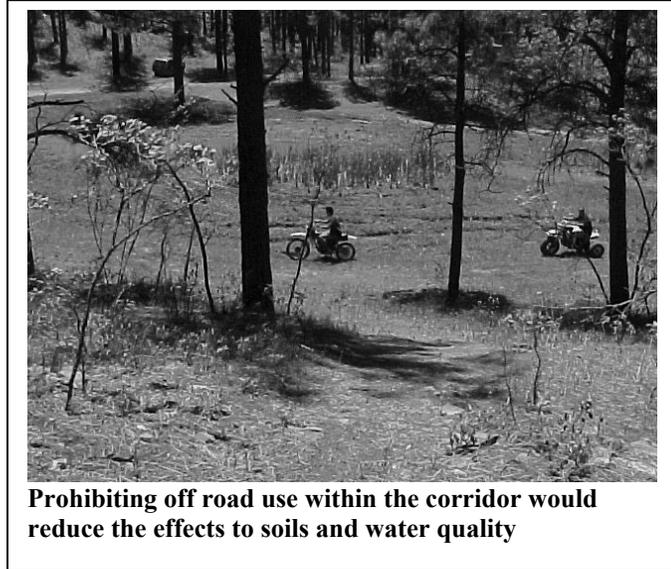
### **3.12 Soils – Affected Environment**

The granitic, metamorphic, and sedimentary parent material produced several soil types. Most of the soil in this area is sandy loam to cobbly sandy loam. Finer textured soils can be found in the river bottom. Poorly consolidated soils (alfisols, inceptisols and entisols) are found throughout the area, while mollisols, or meadow soils, are found in the river bottom and adjacent riparian areas. Soils on or adjacent to steep slopes range from stony to cobbly to very cobbly in nature. Parent material for the meadow soils consists of granite and limestone, while the coarser textured soils of the slopes and higher elevation ridges are made up primarily of granites (USDA-FS 1993).

In general, the soils are in good condition and are very productive. Nonetheless, heavy dispersed recreational use causes localized compaction and erosion.

As described in the water and riparian section, the Wild segment has well-vegetated, stable soils and stream banks. Some small areas of exposed soil are found along trails near the river at Beatty's Flats and Pecos Falls. The lack of ground cover in those few localized sites is primarily due to user-created trails and dispersed camping. Enforcement of the camping prohibition has allowed these sites to gradually recover.

The Recreational segment generally shows satisfactory soil conditions. Minor areas of erosion and sedimentation around the confluences with Mora Creek and Willow Creek occur from heavily used dispersed campsites, uncontrolled parking, off-road driving and user-created trails close to the river. There has been a similar loss of soil and vegetative productivity, including exposed tree roots and compacted soil, in the dispersed camping upland area north of Terrero. User-created trails in the Recreational segment follow the river, sometimes on both sides. These trails cause soil compaction and riparian vegetation damage. If uses are not controlled, loss of vegetation and soil compaction will expand as visitation increases.



### **Soils – Environmental Consequences**

Under the No Action Alternative, there would be no change in the existing conditions described above.

#### All Action Alternatives

Under the action alternatives, the soil conditions would improve as a result of controlled dispersed camping, parking, trail locations and trail use, and off-road driving. All of the action alternatives would result in fewer disturbed and compacted areas. The effects to soil mirror those described for water and riparian conditions, with the Proposed Action and Alternative 2 offering the greatest degree of protection and Alternative 1 offering slightly less.

Under the No Grazing Option, there would be no noticeable difference in the effects to soil, since grazing in the corridor is very limited in duration, frequency and extent (as previously described in the livestock grazing section). Forage utilization standards would continue to be met, riparian areas would continue to be “properly functioning” and soil conditions would continue to be satisfactory overall in the corridor, regardless of the alternative selected.

### 3.13 Fish – Affected Environment

The Pecos River is one of the most productive fishing streams on the Santa Fe National Forest. Historically, the Pecos River supported Rio Grande cutthroat trout, the only trout native to the Pecos River drainage. At present, Rio Grande cutthroat trout are confined to the area above Pecos Falls in the Wild segment due to the presence of non-native fish that out-competed and hybridized with the cutthroat trout. Downstream from Pecos Falls to the Wilderness boundary is primarily a wild brown trout fishery. Small numbers of rainbow trout and “cutbow” hybrids can also be found in this stretch.

The Recreational segment of the corridor sustains a population of wild brown trout and provides habitat for hatchery-reared rainbow trout stocked by the NMG&F. The Recreational segment is also the upper habitat extent of the white sucker. Other non-game species are the longnose dace and fathead minnow. Recent electrofishing surveys by the NMED found large numbers of brown and rainbow trout and no non-game fish species in the Recreational segment (NMED, 1991). One brook trout was captured in the Pecos River above Willow Creek.

The Pecos River is dominated by riffle habitat. Riffles occupy 60 – 70% of the available habitat, while pools occupy 30 – 40%. The streambed is composed primarily of large gravels and cobbles; not many very fine sediments are found, and they are not considered a problem. Adequate gravel for spawning is present. Large woody debris, which creates diversity in the aquatic habitat, occasionally marks the stream particularly in less steep areas. Much of the spawning gravel is directly associated with woody debris, or is found in adjacent low gradient areas. Woody debris also provides cover and escape areas for fish.

Stocking practices vary throughout the corridor. In the Pecos Wilderness, the stocking of fingerlings and fry is allowed under the Santa Fe Forest Plan, but has not occurred for a number of years. Since fish (native and non-native) in this reach are self-sustaining, there was little reason to continue the practice. The Recreational segment is stocked with catchable rainbows, supplementing the natural regeneration of rainbows and browns. In the mid-1990’s efforts were begun to reduce the non-native competition and reintroduce the native cutthroat. The Pecos and the Rito del Padre provide some of the donor stock of native cutthroats.

The NMG&F divided the WSR corridor into two fishery management units, 14 and 15. Unit 14, from the headwaters of the Pecos River and its tributaries down to near Cowles, is managed as a category I-A stream of wild native trout (Rio Grande cutthroat and Gila trout). Unit 15, from Cowles down to Villanueva (approximately 25 miles south of Pecos), is managed as a category I-B stream of exotic trout species. Only about 1/3 of Unit 15 is located within the boundaries of the Santa Fe National Forest; however, the bulk of the fishing occurs on National Forest System and State lands within the corridor.

The Wild segment above Pecos Falls is designated as Special Trout Waters having the following regulations: “Use only artificial flies and lures with single, barbless hooks, all trout must be immediately returned to the water, no trout in possession.” Another Special