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NOMINATION OF

THE WATERS OF THE VALLE VIDAL

AS

OUTSTANDING NATIONAL RESOURCE WATER

New Mexico Department of Game and Fish,
New Mexico Environment Department - Surface Water Quality Bureau,
and
New Mexico Energy Minerals and Natural Resources Department - State Forestry

August 2005

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Executive Summary

The Valle Vidal is one of New Mexico's most prized areas for those individuals that appreciate the splendor of the outdoors. Donated to the people of the United States by the Pennzoil Corporation in 1982, the area is now managed by the U.S.D.A. Forest Service. Trophy elk hunting, fly fishing, horseback riding, hiking, bird watching, and cross country skiing are among the activities for which the Valle Vidal is famous.

Water is the lifeblood of the area's wildlife populations, terrestrial and aquatic. The headwater streams of the Valle Vidal flow into two major drainages, the Rio Grande and South Canadian. New Mexico's state fish, the Rio Grande cutthroat trout, occupies waters on both slopes of the Valle Vidal. Other native and introduced fish species also call the waters of the Valle Vidal home, attracting anglers from around the country. The woodlands support herds of elk and deer as well as a diversity of bird life.

The large meadows of the western portions of Valle Vidal contain the meandering Comanche Creek and its many tributaries, eventually flowing into the Rio Costilla, which flows through the west side of the Valle Vidal into the Rio Grande. The east side of the Valle Vidal contains streams that flow into the South Canadian and eventually the Arkansas River. The headwaters of Middle Ponil, McCrystal, North Ponil, Leandro, and Seally Canyon creeks are all contained within the boundaries of the Valle Vidal. Shuree Lakes discharge into Middle Ponil Creek and are a popular destination for many visitors to the Valle Vidal.

The partners propose to nominate all waters of the Valle Vidal under authority of the Clean Water Act as Outstanding National Resource Water (ONRW). ONRWs are waters that possess outstanding ecological or recreational values. This designation would provide further incentive to maintain the quality of these waters into the future for the benefit of both humans and wildlife. Designation as an ONRW helps ensure that water quality is maintained or improved from the point in time of designation to protect water quality for existing uses. ONRW designation would not limit existing uses as long as these uses do not degrade water quality from the levels at the time of designation.

Protection of ONRWs is recognized under New Mexico water quality standards - antidegradation policy (Paragraph 3, Subsection A of 20.6.4.8 NMAC [New Mexico Administrative Code]), that states no degradation shall be allowed in high quality waters designated by the commission as ONRWs. This policy is supported by the implementation plan (20.6.4.8.B NMAC), which

encourages best management practices within watersheds to reduce or abate sources of water pollutants.

Many waters of the Valle Vidal are eligible for protection as Wild and Scenic under the federal Wild and Scenic Rivers Act. They directly support an outstanding trout fishery that is visited by over 5,000 anglers annually. New Mexico's largest elk herd roams the watersheds drained by the streams of the Valle Vidal. Numerous hunters, scouts, campers, and others who benefit from the pristine qualities of these streams and lakes also utilize these areas.

High water quality adds to the large variety of wildlife and plants, including several sensitive and unique species that inhabit the Valle Vidal. Though some stream segments on the Valle Vidal do not currently meet the requirements for their designated use as "cold water fishery," many groups and individuals have been working proactively to improve the condition of these waters for recreation and wildlife.

There are several ongoing and potential activities that might contribute to a reduction of water quality in the future. Ongoing activities include livestock grazing, recreation, roads, invasive plants and their control, fisheries management, and fire. Current activities are carefully monitored through cooperation of the U.S. Forest Service, New Mexico State Forestry, and New Mexico Department of Game and Fish. Proactive and well-planned management is not expected to create permanent reductions in water quality.

Nomination of the waters of the Valle Vidal as ONRW may help guide the approval process for future activities that would affect water quality. Potential activities that could impact water quality in the future include the possibility that the area may be developed for logging or oil and gas. These activities have the potential to decrease water quality through sedimentation from road building and high use of forest roads by maintenance trucks, depletion of groundwater levels, and discharge of water and extraction-derived pollutants produced in oil or gas pumping. Though this development may provide short-term economic gains, it is likely that many of the existing local industries would be negatively and permanently affected by this development. Existing industries are based around providing services for individuals wishing to recreate on the Valle Vidal including hunters, anglers, wildlife watchers, and others just wishing to experience the grandeur of the area.

The New Mexico Department of Game and Fish, New Mexico Environment Department – Surface Water Quality Bureau, and New Mexico State Forestry believe that designation of the waters of the Valle Vidal as ONRWs will help conserve the existing conditions and the special qualities of the Valle Vidal into the future. With appropriate management this area can continue to be a gem within New Mexico's borders, providing the opportunity for many to visit and enjoy the recreational opportunities that exist there as well as providing habitat for large numbers of wildlife species including New Mexico's state fish, the Rio Grande cutthroat trout.

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Petition for the waters of the Valle Vidal as an ONRW

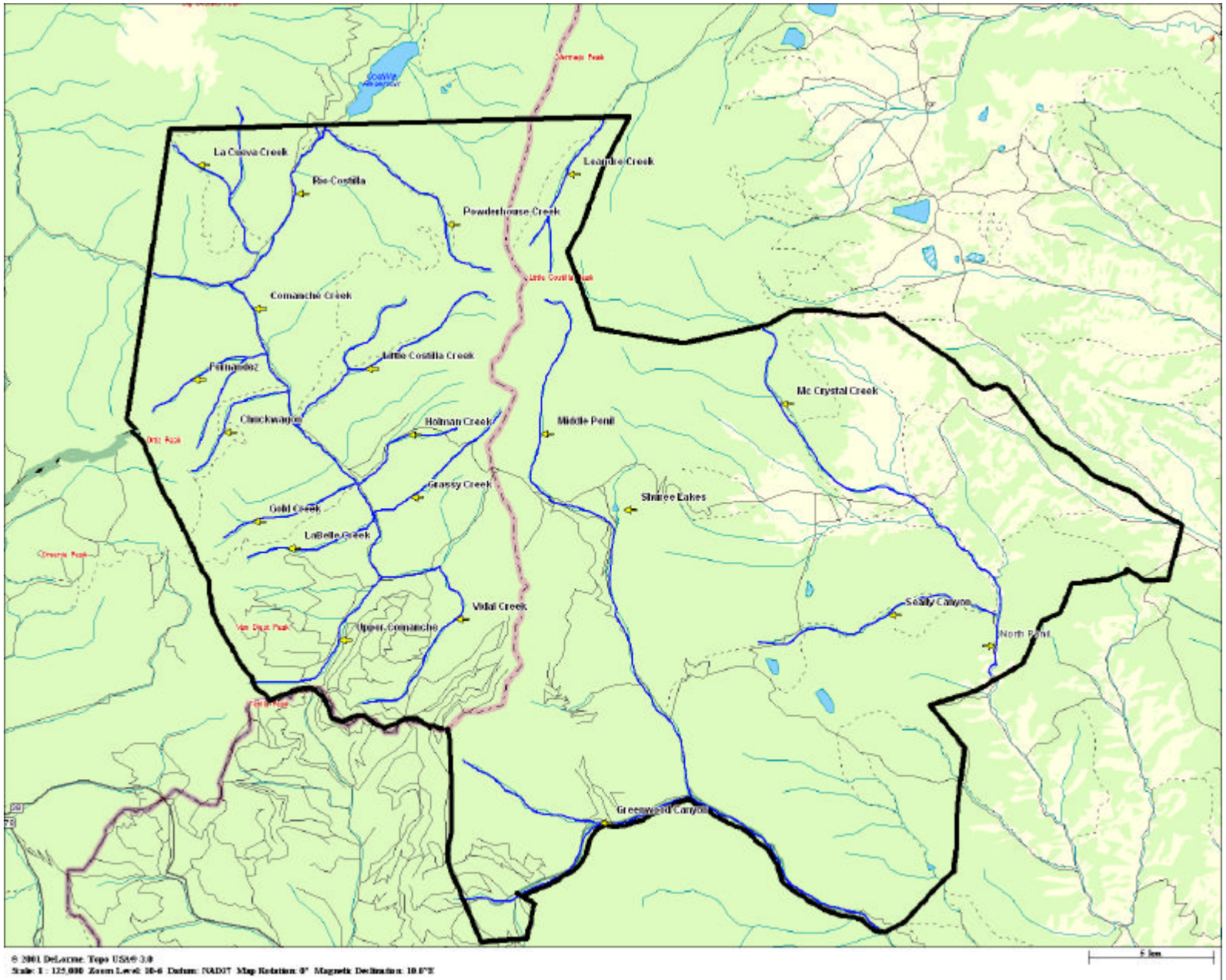
20.6.4.9 NMAC (State of New Mexico Standards for Interstate and Intrastate Surface Waters)

A. Procedures for nominating an ONRW
   1. Map
   2. Written statement based on scientific principles ONRW criteria listed in Subsection B
   3. Water quality data for baseline
   4. Discussion of activities that might contribute to reduction of water quality in the proposed ONRW
   5. Any additional evidence to substantiate designation, including an analysis of the economic impact of the designation on the local and regional economy within the state of NM.
   6. Affidavit of publication of notice

B. Criteria for ONRWs
   1. The water is a significant attribute of a state gold medal trout fishery, roadless area, national or state park, national or state monument, national or state wildlife refuge or designated wilderness area, or is part of a designated wild river under the federal Wild and Scenic Rivers Act –or-
   2. The water has exceptional recreational or ecological significance –or-
   3. The existing water quality is equal to or better than the numeric criteria for protection of aquatic life uses, recreational uses, and human health uses, and the water has not been significantly modified by human activities in a manner that substantially detracts from its value as a natural resource.

Section 1. Map of Valle Vidal.

All the waters encompassed in the 100,000-acre Valle Vidal Wildlife Management Unit of the Carson National Forest (Valle Vidal) are proposed for designation as Outstanding National Resource Waters (ONRW). The Valle Vidal (located in Colfax and Taos counties of northeastern New Mexico) has three main drainages: Rio Costilla, Middle Ponil, and North Ponil creeks. Additionally, the Valle Vidal contains the headwaters of Leandro Creek, which flows to the Vermejo River. Permanently watered streams (high-lightened in blue on following map) are more common in western than eastern portions of Valle Vidal. The Pennzoil Company donated the Valle Vidal to the American people in 1982. It is now administered as a special unit by the Questa District of Carson National Forest.



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Scale: 1 : 125,000 Zoom Level: 10-6 Datum: NAD27 Map Rotation: 0° Magnetic Declination: 10.0°E

Section 2. Support for designation of Valle Vidal as ONRW.

1. Significant attributes of water

The Valle Vidal is one of New Mexico's most scenic landscapes. The lush valleys of the Valle Vidal were formed by the collapse of an ancient volcanic crater. New Mexico Magazine touts the Valle Vidal as one of the highlight areas for outdoor recreation in New Mexico, Great Outdoor Recreation Pages (GORP) list the Valle Vidal as one of the ten best camping areas in the country, stating that it "is a special treasure to those who want to experience the west as it once was." During summer months, the Valle Vidal is popular among anglers, wildlife watchers, hikers, and others wishing to take in its splendor. Winter months provide opportunities for snowmobiling, snowshoeing, and cross-country skiing.

The Valle Vidal is part of the Carson National Forest, and is managed as a special wildlife area, containing many large roadless areas. The Valle Vidal boasts some of northern New Mexico's best aquatic resources. The Valle Vidal includes several waters, which have sufficient values to classify them under the federal government's Wild and Scenic Rivers program (Table 1). McCrystal Creek has been determined to be eligible based on its remarkable fish (Rio Grande cutthroat trout), wildlife, scenery, as well as recreational and ecological values. The entire drainage, including the North Ponil is determined to have remarkable historic value. Middle Ponil Creek is outstanding for its wildlife, historic, and recreational values. Additionally, the entire Rio Costilla drainage, including Powderhouse, La Cueva Creek, as well as Comanche Creek and its tributaries, are eligible to be classified as "wild, scenic or recreational" under the Wild and Scenic Rivers Act.

These rivers receive protection as if they were designated Wild and Scenic. Therefore, they must be managed to maintain and, to the extent possible, enhance their outstanding values. Management and development of the rivers cannot be modified to the degree that eligibility or classification would be affected.[1]

[1] Carson Forest Plan Amendment 12, Protection of Eligible Wild, Scenic, or Recreational River Areas, Carson National Forest, Taos County, NM.

Table 1. Eligibility of Valle Vidal waters under the federal Wild and Scenic Rivers Act.

Drainage	Water Name	Wild and Scenic Classification
Middle Ponil	Middle Ponil	Recreation
North Ponil	McCrystal	Recreation
North Ponil	North Ponil	Wild
Rio Costilla	Rio Costilla	Recreation
Rio Costilla	La Cueva	Scenic
Rio Costilla	Powderhouse	Wild
Rio Costilla (Comanche)	Chuckwagon	Wild
Rio Costilla (Comanche)	Comanche Creek	Recreation
Rio Costilla (Comanche)	Foreman	Wild
Rio Costilla (Comanche)	Gold	Wild
Rio Costilla (Comanche)	Grassy	Scenic
Rio Costilla (Comanche)	Holman	Recreation
Rio Costilla (Comanche)	La Belle	Recreation
Rio Costilla (Comanche)	Little Costilla	Wild
Rio Costilla (Comanche)	Vidal	Wild

2. Recreational or ecological significance:

2.1 Recreational significance

Whether one comes to the Valle Vidal Unit of the Carson National Forest to hunt, fish, or hike, this is one of the great recreational experiences available in New Mexico, if not the nation. The Valle Vidal was one of the first national forest units in the state where resource managers agreed to maintain quality elk herds as well as a quality hunting experience. License numbers were kept intentionally low to provide the public the opportunity to locate trophy-sized bulls typically not found on more intensively hunted public lands.

From the start, it also was managed as a once-in-a-lifetime hunting opportunity, an effort to provide more hunters the opportunity to experience this beautiful mountainous area. In addition, closures occur on portions of the Valle Vidal during winter (January 1 to March 31) and spring calving (May 1 to June 30) to protect the elk. Legally licensed elk hunters

may also hunt for bear during their seasons and there are also twenty permits available to hunt wild turkey.

For anglers, the waters of the Valle Vidal offer the chance to catch the Rio Grande cutthroat trout *(Oncorhynchus clarki virginalis),* as well as brown trout (*Salmo trutta)*, rainbow trout (*O. mykiss)* and brook trout (*Salvelinus fontinalis)*. Since 1997, an average of 5,000 anglers have visited the Valle Vidal, fishing 15,000 days each year. Rio Costilla (Costilla Creek) and Shuree Lakes are the most visited destinations. In keeping with the spirit of maintaining a quality angling experience, fishing is not allowed on the Valle Vidal until July 1.

Rainbow trout are stocked in the ponds of Shuree Lakes, which have a bag limit of two fish 15 inches or larger. One of the ponds is designated as a "kids pond" for anglers under 12 years of age. All stream fishing is catch-and-release. By providing both opportunities for keeping large stocked trout and catch-and-release fishing for wild fish in streams, the Valle Vidal attracts a diverse group of anglers. Characteristics of individual streams included in this nomination are presented in Appendix 1.

"The Valle Vidal is still one of the few easy access public fisheries that's good enough to guide on," writes author and fishing guide Taylor Streit. "It's every man's stream, not just because there are lots of fish, but the gentle nature of the meadows make it perfect for both young and old. I've even had handicapped people catch fish there."

Camping is a popular activity in the Valle Vidal. To help protect the Valle Vidal from impacts of camping, it is restricted to campground areas or away from roads for those choosing to pack into the backcountry. Great Outdoor Recreation Pages voted two campgrounds, Cimarron and McCrystal, among the top ten best U.S. Campgrounds.

Scouts from around the nation and several foreign countries visiting the Philmont Scout Ranch have been using the Valle Vidal to teach Leave No Trace skills. Since 1998, more than 23,000 participants have had a portion of their trek on the Valle Vidal. As well, several camps are used to teach young people a variety of interesting skills from astronomy to the rich history of the Valle Vidal area. A letter from Philmont Scout Ranch is appended, describing their use and value of the wilderness experience for their scouts on the Valle Vidal (Appendix 4).

Separate cross-country skiing/snowshoeing and snowmobiling areas are designated on the west side of the Valle Vidal. Opening of winter recreational areas usually coincides with the migration of the elk herd to the east side. In summer, the wide-open valleys of the Valle Vidal provide great places for hiking and horseback riding for all skill levels.

The streams, lakes, meadows, woodlands, and forests of the Valle Vidal also provide excellent bird watching opportunities, and the area is an important destination for both resident and out-of-state birders. The value of the Valle Vidal to nesting, migrating and wintering birds, as well as the area's attractiveness for bird watching is enhanced by the pristine nature of the surroundings. Within the Valle Vidal, birders can expect to find species typical of the Southern Rocky Mountains, including Bald Eagle (*Haliaeetus leucocephalus)*, Peregrine Falcon (*Falco peregrinus anatum)*, Northern Goshawk (*Accipiter gentiles)*, Three-toed Woodpecker (*Picoides tridactylus dorsalis*), American Dipper (*Cinclus mexicanus unicolor*), Grace's Warbler (*Dendroica graciae graciae*), Western Tanager (*Piranga ludoviciana*), Green-tailed Towhee (*Pipilo chlorurus*), and Red Crossbill (*Loxia curvirostra*).

2.2 Ecological significance

The Valle Vidal supports a large variety of wildlife species (Appendix 2, tables 2-1 and 2-2). There are several threatened or sensitive species that are found on the Valle Vidal as well as the largest elk herd in the state. Although the area is not classified as a wilderness area, there are a limited number of open roads and many of these have seasonal closures, affording wildlife a great deal of protection from human traffic.

All of the main drainages contain populations of Rio Grande cutthroat trout, the state fish of New Mexico. The Rio Grande cutthroat trout is currently found in less than 10 percent of its native range in the watersheds of New Mexico and Colorado. Rio Grande cutthroat trout is listed as a species of concern by the U.S. Fish and Wildlife Service, New Mexico Department of Game and Fish, and Region 3 of the U.S. Forest Service. The Rio Grande cutthroat trout is currently under litigation to be considered a "candidate" species for federal listing under the Endangered Species Act. All of the waters contained on the Valle Vidal are suitable and historical, Rio Grande cutthroat trout habitat. Comanche, Leandro, McCrystal, and Powderhouse creeks all contain Rio Grande cutthroat trout populations that have high levels of genetic purity (NMDGF 2002). The entire Rio Costilla drainage is proposed for restoration for Rio Grande cutthroat trout. Other native fishes that currently occur in the waters of the Valle Vidal include creek chub (*Semotilus atromaculatus*) and longnose dace (*Rhinichthys cataractae*).

There are several amphibians, mammals, and birds, listed as sensitive or threatened species that are found on the Valle Vidal (Appendix 2). Northern leopard frogs (*Rana pipiens)* are listed as a Region 3 U. S. Forest Service sensitive species and also have been documented in the Valle Vidal. Mammals that are dependent on maintenance of streams with high water quality include the little brown myotis bat (*Myotis lucifugus)*, long-eared myotis bat (*Myotis evotis)*, fringed myotis bat (*Myotis thysanodes)*, long-legged myotis bat (*Myotis volans)*, Western small-footed myotis bat (*Myotis ciliolabrum)*, and heather vole (*Phenacomys intermedius)*. Bald eagles (*Haliaeetus leucocephalus)* are also known to utilize the waters of the Valle Vidal.

Additionally, rare aquatic invertebrates, such as Knobbedlip fairy shrimp (*Eubranchipus bundyi*) and Packard's fairy shrimp (*Branchinecta packardi),* have been found in several ephemeral waters on the Valle Vidal. The Packard's fairy shrimp is known from only two other sites in New Mexico; El Malpais and Mount Taylor.

Plant communities on Valle Vidal are a diverse assemblage of forest, mountain meadow, wetland, and alpine tundra vegetation typical of the southern Rocky Mountain floristic region. Lower elevation forests are dominated by ponderosa pine (*Pinus ponderosa*) while mid-elevations have mixed conifer forests of ponderosa pine, limber pine (*Pinus flexilis*), Douglas fir (*Pseudotsuga menziesii*), white fir (*Abies concolor*), blue spruce (*Picea pungens*), and large glades of aspen (*Populus tremuloides*). The highest forested elevations are covered with subalpine forests of corkbark fir (*Abies arizonica*), Engelmann spruce (*Picea engelmannii*), and bristlecone pine (*Pinus aristata*).

Several stands of bristlecone pine on Valle Vidal are considered old-growth for that species. In fact, a bristlecone pine tree on the south flank of Little Costilla Peak is one of the largest known trees of this species in the world. There are two co-champion bristlecone pines on the Big Tree Register – one on Valle Vidal and another of similar size in adjacent Colfax County.

Alpine tundra and mountain meadow plant communities are relatively rare in the mountains of northern New Mexico. Tundra vegetation on Valle Vidal is confined to a small area at the highest elevations of Little Costilla Peak. However, the mountain meadows of Valle Vidal range from small forest openings to extensive fescue grasslands that contribute significantly to scenic views and the wildlife species that depend on these open habitats.

Riparian woodlands and wet meadows are also rare in New Mexico. These are especially diverse plant communities that provide clean water by slowing and filtering runoff. Woody vegetation along Valle Vidal streams range from narrowleaf cottonwood (*Populus angustifolia*) and willows (*Salix* sp.) to mountain alder (*Alnus incana*) and red-osier dogwood (*Cornus sericea*) at higher elevations. Numerous springs and seeps produce wet meadow cienegas and bogs dominated by various native sedges (*Carex* sp.), grasses, and a diverse array of other herbaceous plants that create unique and productive wildlife habitats.

3. Existing Water Quality.

The Surface Water Quality Bureau (SWQB) of the New Mexico Environment Department has monitored and assessed the streams on the Valle Vidal over the last 16 years. These data are summarized in Appendix 3. A large majority of these assessments indicate the waters are at or above the applicable standards, i.e. are meeting their designated uses. However, some of the streams do not currently meet their designated uses (Table 2). Appendix 3, Table 3-2 lists the exceedence ratios, the number of times a parameter exceeded the standard over the total number of times that parameter was measured. For most parameters the exceedence ratio must be 0.15 for the segment to be listed as not supporting the designated use.

Several pro-active projects, by several organizations, to improve these streams and riparian habitats have been undertaken. Currently the Comanche Creek working group includes individuals from the Quivira Coalition, New Mexico Department of Game and Fish, Carson National Forest, and New Mexico Environment Department as well as the current grazing permittee for the Valle Vidal. A Watershed Implementation Plan for the Comanche Creek Watershed, funded by a 319 grant from the EPA, provides the outline of projects to improve water quality in Comanche Creek.

Section 3: Baseline Water Quality Data.

The New Mexico Environment Department (NMED) has monitored water quality at 7 sites within the boundaries of the Valle Vidal, as well as several sites at downstream locations (Appendix 3, Table 3-1). Sites in the Ponil Watershed were monitored 7 times in 1989 and again in 1998 (Appendix 3, Table 3-4). The Costilla Watershed was surveyed 2 to 4 times a year between 1986 and 1995 and 8 times in 2000 (Appendix 3, Table 3-3 and Figures 3-1 and 3-2). Thermographs were also deployed in Comanche Creek in 2002 and 2003 to record diurnal and seasonal variations in temperature. Thermographs were placed at Comanche Creek below the elk exclosure between May 18 and October 23 of 2002 and at Comanche Creek above the confluence with Rio Costilla between July 2 and September 4 of 2003 (Appendix 3, Figure 3-3).

Water quality monitoring included measurement of a number of chemical and physical parameters including: dissolved oxygen (DO), temperature, pH, turbidity, total nitrogen (TN), total phosphorus (TP), and dissolved metals such as aluminum, zinc and lead. These parameters are then compared to applicable standards to determine if the waters are meeting their designated uses. Stream bottom deposits are assessed to determining the percent of fine substrate (silt and clay) from a geomorphic survey, benthic macroinvertebrate surveys, and comparing these variables to those from a reference site. The reference should be minimally disturbed and have characteristics such as elevation, geology, hydrology, hydraulics, watershed size, in-stream habitat (pools, substrate, etc), and riparian vegetation similar with the study site.

As Comanche Creek is one of the waters of the Valle Vidal not currently meeting designated uses (Table 2), there are projects underway to improve its condition. A Watershed Implementation Plan for the Comanche Creek Watershed, funded by a 319 grant from the EPA, provides the outline of projects designed to improve water quality in Comanche Creek.

The following is a brief overview of recent results of water quality surveys on the streams of the Valle Vidal.

Rio Costilla Basin**:**
From May through October 2002 Comanche Creek thermograph recorded temperatures higher than 23°C, which are in excess of those required to support the designated use of the high quality cold water fisheries. Geomorphic and benthic macroinvertebrate data, however, indicated full support for the designated use.

Eight water quality samples collected from Costilla Creek below the reservoir from May through October 2000 indicated that a small proportion of the samples had exceedences for aluminum, lead, nickel, and zinc. None, however, was persistent enough to result in an assessment of nonsupport of the designated use. Below the Valle Vidal boundary, the turbidity requirement was exceeded for the spring samples.

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Middle Ponil:
From May 1998 through March 1999, Middle Ponil Creek had exceedences for turbidity indicating a slight impairment to the high quality cold-water fishery designated use. In the summer of 2002, a nearly 100,000-acre fire burned through much of the Middle Ponil drainage below Greenwood Canyon. It is likely that ash flows from this event caused dramatic changes to water quality in the lower portions of Middle Ponil Creek.

North Ponil:
From May 1998 through March 1999, North Ponil Creek had exceedences for turbidity and phosphorus, indicating a slight impairment to the high quality cold-water fishery designated use. McCrystal Creek, a tributary to North Ponil Creek, assessed in 1999, had temperatures in excess of the requirements for the high quality cold-water fishery designated use.

Other Valle Vidal Waters:
Leandro Creek and Seally Canyon were assessed in 1998 and met all designated use requirements.

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Table 2: Current classification of Valle Vidal waters for their designated use categories as identified by NMED.

		Designated Uses										
Drainage	**Water Name**	**Domestic Water Supply**	**Fish Culture**	**High Quality Cold Water Fishery**	**Industrial Water Supply**	**Irrigation**	**Livestock Watering**	**Municipal Water Supply**	**Secondary Contact**	**Wildlife Habitat**	**Probable Source of Impairment**	**Specific Impairments**
Vermejo	**Leandro Creek**	Fully Supporting		Fully Supporting	Fully Supporting	Fully Supporting	Not Assessed	Fully Supporting	Not Assessed	Fully Supporting		
Ponil	**McCrystal Creek**	Fully Supporting		Not Supporting	Fully Supporting	Fully Supporting	Not Assessed	Fully Supporting	Not Assessed	Fully Supporting	Loss of Riparian Habitat	Temperature
Ponil	**Middle Ponil Creek**	Fully Supporting		Not Supporting	Fully Supporting	Fully Supporting	Not Assessed	Fully Supporting	Not Assessed	Fully Supporting	Forest Roads, Loss of Riparian Habitat, Rangeland Grazing, Streambank Modifications/destabilization	Sedimentation/ siltation, Temperature, Turbidity
Ponil	**North Ponil Creek**	Fully Supporting		Not Supporting	Fully Supporting	Fully Supporting	Not Assessed	Fully Supporting	Fully Supporting	Fully Supporting	Habitat modification, Loss of Riparian Habitat, Rangeland Grazing, Silviculture Harvesting	Sedimentation/ siltation, Temperature, Turbidity
Ponil	**Seally Canyon**	Fully Supporting		Fully Supporting	Fully Supporting	Fully Supporting	Not Assessed	Fully Supporting	Not Assessed	Fully Supporting		
Ponil	**Shuree Pond (North)**	Not Assessed		Not Assessed	Not Assessed	Not Assessed	Not Assessed	Not Assessed	Not Assessed	Not Assessed		
Ponil	**Shuree Pond (South)**	Not Assessed		Not Assessed	Not Assessed	Not Assessed	Not Assessed	Not Assessed	Not Assessed	Not Assessed		
Costilla	**Comanche Creek (Costilla - Little Costilla)**	Fully Supporting	Fully Supporting	Not Supporting		Fully Supporting	Fully Supporting		Not Assessed	Fully Supporting	Rangeland Grazing	Temperature
Costilla	**Costilla Creek (Comanche to Costilla Dam)**	Fully Supporting	Fully Supporting	Fully Supporting		Fully Supporting	Fully Supporting		Not Assessed	Fully Supporting		
Costilla	**Comanche Creek Tributaries**	Not Assessed		Not Assessed	Not Assessed	Not Assessed	Not Assessed	Not Assessed	Not Assessed	Not Assessed		

Section 4. Activities that might contribute to the reduction of water quality on the Valle Vidal.

Current Activities:
Protecting the watershed and improving water quality were recognized as challenges for resource management agencies as early as 1983 when the U.S. Forest Service, Vermejo Park Ranch, and the New Mexico Game Commission signed a management directive for Valle Vidal. At that time, riparian habitat was considered "poor." Lack of streambank vegetation contributes to increased sediment loads as well as increased water temperatures.

Grazing
There have been many improvements in grazing management and on-the-ground restoration efforts by several groups to foster recovery of riparian zones.

Currently, range riders discourage cattle from lingering in riparian zones. In addition, grazing exclosures have been placed in many areas to encourage reestablishment of woody riparian vegetation from natural regrowth or plantings have been made by volunteer organizations. Changes in these proactive management practices might have negative effects on water quality and watershed health. Managers will continue to work with permittees to enhance improving trends in water quality of Valle Vidal streams.

Roads and OHV Use
Since 1982, approximately 300 miles of roads have been closed or rerouted to limit their impacts to aquatic systems in the Valle Vidal[2]. Roads and trails are often the main contributor of fine sediments to mountain streams. Additionally, recreation has impacts on riparian vegetation due to trampling by campers and hikers. Currently, regulations on the Valle Vidal prohibit use of vehicles off of established roads and camping is confined to designated-use areas or backcountry camping, at least ½ mile from open roads, 100 yards from natural waters, and 300 yards from artificial impoundments.

Off highway vehicle (OHV) users are one of many groups that appreciate the Valle Vidal for its recreational values. Unfortunately, OHV use, especially illegal and irresponsible use, is an activity that has the potential to contribute to reduction of water quality in the Valle Vidal. Irresponsible motorized use on public lands causes degradation of plant and wildlife habitat; erosion of soils, reduction of plant populations and plant diversity; water and air pollution; damage to cultural resources; and interference with other forms of

[2] Comanche Creek Watershed Implementation Plan – Bionomics Southwest 2003.

recreation.[3] Specifically, OHV use can cause erosion and contribute to increases in conductivity, sediment deposition, and turbidity in water systems. This is especially a risk when OHV users drive in, or up and down the banks of the water body.

OHV use is popular on all open Forest Service roads in the Valle Vidal including the main road through the Valle Vidal (F.R. 1950) and the jeep loop (F.R. 1950, F.R. 1913 and F.R. 1914). Unfortunately, some users choose to stray from these legally designated routes to travel overland and on closed roads and two-track routes. Some stray from designated routes while others gain access from areas outside Valle Vidal. Two examples of illegal access from other Forest Service units include the closed forest service road near Midnight Meadows in the upper Bitter Creek drainage in the Upper Red River area and overland travel from the Anchor mine site, also in the Upper Red River drainage. The Carson National Forest currently has only one OHV enforcement officer for the entire Forest. The large patrol area, as well as extent of OHV abuse Forest wide, makes it difficult for the Forest Service to control problems related to OHV abuse. Fortunately, programs such as the state administered 319 program provide opportunities to help diminish impacts of OHV use. Currently Amigos Bravos, in cooperation with the Forest Service is implementing a 319 project to patrol, control, and mitigate OHV use in the Upper Red River Watershed. Under this project the two problem areas mentioned above are targeted for more effective closure actions and reclamation. To avoid degradation of waters in the Valle Vidal, other projects of this nature could be implemented on Valle Vidal and adjacent Forest Service areas to control potential problems. The Carson National Forest has recognized the problem of irresponsible OHV in the Forest and has recently dedicated substantial resources towards mapping the problem, hosting public meetings, signage and fencing, and working with the public on issues of enforcement.

Best Management Practices (Invasive Plants, Fishery Management, Fire Management)
There are several ongoing and proposed management activities that may cause short-term impacts to water quality, but would have an overall positive effect on health of the watershed and wildlife habitats. The short-term reductions in water quality caused by these management activities should be considered in context of the long- term benefits gained from improved watershed health. Included in these activities are control of invasive species (plant and animal), fisheries management, and fire management.

Controlling invasive and nonnative noxious weeds is a key piece of the Forest Service natural resource agenda for sustaining forests and watershed health. Nationally, invasive species infest 4,600 acres of new land daily[4]. These plant invasions may lower water tables, prevent recovery of disturbed riparian habitat, decrease food available to wildlife and affect food webs[5], alter important ecological processes and resources[6], and lead to

[3] The Wilderness Society, "A Citizen's Guide to Off-Road Vehicle Management and Your Bureau of Land Management Public Lands, April 2002.
[4] Westbrooks, Randy G. Invasive plants: changing the landscape of America: fact book/.-- Washington, D.C.: Federal Interagency Committee for the Management of Noxious and Exotic Weeds, 1998.
[5] Harty, Francis M. 1986. Exotics and their ecological ramifications. Nat. Areas J. 6:20-26.
[6] Melgoza, Graciela, R. S. Nowak and R. J. Tausch. 1990. Soil water exploitation after fire: competition between Bromus tectorum (cheatgrass) and two native species. Oecologia 83:7-13.

endangerment of native species[7,8]. Noxious weeds can disrupt grazing patterns, increase the intensity and frequency of natural fires, lower water tables, and increase soil erosion rates.[9] Noxious weeds are a potential problem to water quality, fisheries, and watershed health, and decrease ecosystem health along rivers and streams. These aggressive alien plants can colonize disturbed areas and prevent succession of native plants, ultimately resulting in slower recovery of disturbed habitat and increased sediment run-off. Riparian shade may also be reduced when native riparian species are replaced with invasive nonnative species.

Proposed activities for invasive plants on Southwestern Region Forests include eradication or control of weeds that pose a threat along riparian areas, roads, trails, recreation sites, administrative sites, gas/oil pads (and pipelines), and range improvements. Areas of recent natural disturbance, such as the Ponil Fire complex and other burned areas will also receive attention. Proposed activities include:

- Hand pulling, grubbing with hand tools or hand-operated power tools, mowing and disking, or plowing with tractor-mounted implements;
- biological control using insects or plant pathogens introduced into the weed habitat;
- controlled grazing using goats and sheep to intensively and repeatedly graze weeds;
- herbicide application to weed populations using hand or vehicle-mounted sprayer applications;
- prescribed burning using limited pile or broadcast burning to eliminate seed heads and resident populations of weeds.

Following invasive plant control elimination efforts, appropriate native species will be restored.[10].

Currently, restoration of Rio Grande cutthroat trout and other native fishes is a high priority for Carson National Forest and New Mexico Department of Game and Fish. Nonnative fish species compete with native species. In addition, several nonnative trout species hybridize with native trout, thereby eliminating the native species. The entire Rio Costilla Drainage, including Comanche Creek, is proposed for restoration of the native fish community. Activities within this project would potentially involve removal of nonnative trout and white sucker by mechanical removal and application of a piscicide to the water. Application of a piscicide would have to be approved by the New Mexico

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[7] Parenti, Robert L. and E. O. Guerrant, Jr. 1991. Down but not out: reintroduction of the extirpated Malheur wirelettuce, Stephanomeria malheurensis. Endangered Species Update 8:62-63

[8] Flather, Curtis H.; Linda A. Joyce and Carol A. Bloomgarden. 1994. Species Endangerment Patterns in the United States. USDA Forest Service Rocky Mountain Forest and Range Experiment Station General Technical Report RM-241, Fort Collins, Colorado.

[9] Greater Yellowstone Coalition, Threats to Wildlife, Exotic Plants

[10] Summary of the Draft Environmental Impact Statement for the Environmental Impact Statement for the Invasive Plant Control Project Carson and Santa Fe National Forests in Colfax, Los Alamos, Mora, Rio Arriba, San Miguel, Santa Fe, Sandoval and Taos Counties in New Mexico. USDA Forest Service, Southwestern Region.

Water Quality Control Commission. The Rio Grande cutthroat trout populations in Powderhouse and Leandro Creeks were restored to Rio Grande cutthroat trout with the use of piscicide and mechanical removals.

Wildfire management activities, such as thinning and prescribed burning, increase diversity within the forest and reduce the likelihood of large scale, catastrophic wildfire that could cause long- term degradation in water quality as a result of topsoil loss. Following the Ponil Complex Fire of 2002, the Middle Ponil Drainage experienced large scale flooding and erosion, which eliminated most of the aquatic life in the lower drainage.

Potential Activities:

Oil and Gas Development

The El Paso Corporation has requested authorization from US Forest Service to explore for and develop natural gas resources in the Valle Vidal. At this time, the Carson National Forest is attempting to amend the forest plan to include the Valle Vidal[11]. It is anticipated that after this amendment is completed, an official analysis will be conducted to determine the impacts of oil and gas development, specifically coal bed methane, on the Valle Vidal.

There are several impacts of oil and gas development that can be anticipated to affect water quality and the natural landscape. Their severity depends upon level of development. Currently it is estimated that between 190 and 500 wells will be installed[12]. One of the obvious necessities for installation and maintenance of wells would be construction of additional roads to access them. These roads would likely increase sedimentation in streams. Heavy traffic on these roads will likely cause elevated levels of dust and potential air pollution issues

Well pad site on neighboring Vermejo Park Ranch.

During the oil/gas extraction process, water is pumped from aquifers associated with coal beds. The aquifer must be pumped out ("produced") to cause coal beds to release methane gas. How "produced" water is disposed of as well as its removal will affect how severe impacts may be on water quality and quantity. Water quantity might be diminished in those streams and pond systems that depend on natural springs. There are

[11] Federal Register: 70 FR 34441, June 14, 2005

[12] Power, T. M. 2005, The local ecomomic impacts of natural gas development in Valle Vidal, New Mexico. A report prepared as comment to the Carson National Forest.

several options for "disposal" of water produced during the extraction process. Water can be reinjected into the aquifer, released into natural stream systems, or held in ponds. Often, water associated with this pumping is brackish, high in suspended solids and potentially contains other contaminants.

Coal bed methane extraction is underway in nearby areas. "In Colorado, development of coal bed methane has been underway the longest in La Plata County, including Durango. While the geology there is different than in the Raton Basin, the experiences of La Plata County citizens are instructive regarding the types of environmental impacts that coal bed methane can bring. Along the Fruitland Coal Outcrop, early methane production led to "uncontrolled seeps of flammable and toxic gases, underground coal fires, large-scale vegetation die-off and contamination of groundwater, domestic wells, and homes." [13]

Timber Harvest and Forest Management

Some Valle Vidal forests are suitably mature and accessible for timber harvest. There are, however, no large mills within an economical haul distance to support an extensive cut of this resource. A few small, local mills might be established in the future to harvest small timber leases if this activity is prescribed in the forthcoming Carson National Forest Management Plan. This forest management plan may also prescribe some forest thinning activities to maintain or improve forest health. These activities would create temporary roads and soil disturbance that could increase sediment delivery to streams for a year or two until vegetation is reestablished. Best management practices for erosion control and sediment retention would be applied to these disturbances.

Section 5. Other information regarding ONWR designation for waters of Valle Vidal

Many of the land-based economies of northern New Mexico are based on production of animals: bison, beef cattle, and sheep. Since the 1970s, however, there has been steady growth in the state's land and water based recreation businesses. Those enterprises are often more dependent upon production of fish and wildlife than the traditional products of the livestock industry. The success of this relatively new industry, the fish and wildlife industry, is dependent upon the State of New Mexico maintaining a reputation for unspoiled vistas and abundant wild animals and fish. That budding industry definitely would benefit from designating waters of the Valle Vidal as Outstanding National Resource Waters. The designation would make the area even more marketable than it is.

Clearly, much of the Valle Vidal's appeal comes from the generally undisturbed state of the land and streams in the area. If there were impacts to the scenic and recreational experiences because of degradation of water quality, local businesses that cater to visitors of the Valle Vidal might experience large economic declines. Degradation of water

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[13] Draper, Electa. "More wells urged despite woes," The Denver Post, 6/7/00.

quality could impact the quantity and types of wildlife that currently use the area, have negative impacts on angling, as well as impact the scenic quality of streams and lakes on the Valle Vidal.

The U.S. Fish and Wildlife Service estimates that in 2001, over 670,00 individuals participated in wildlife watching activities in New Mexico. Of those, nearly 400,000 were nonresidents who came here to see elk, bears, eagles, turkeys and more than 500 other species of birds that frequent the state[14]. Wildlife watching expenditures statewide were estimated to be $558 million. Fishing had an estimated statewide expenditure of $176 million and hunting contributed another $153 million. The expenditures total roughly a billion dollars annually pumped into the state's economy by people who hunt, fish or watch wildlife. The total impact to the state's economies is a bit less than $2.5 billion.

As one of New Mexico's prime public viewing, fishing, and hunting areas, the Valle Vidal accounts for a substantial portion of this economic activity. The people of New Mexico and the nation who hunt and fish especially value it. They recognize it for the rare opportunity it is, a once-in-a-lifetime chance to pursue one of North America's greatest big game species, the elk, in one of New Mexico's most wonderful locations.

Elk hunting on the Valle Vidal is viewed as exclusive, hunters being limited to one bull and one cow hunt in their lifetime. In the case of archery and muzzleloader hunts, which have an either-sex bag limit, those hunters only get one opportunity to hunt the Valle Vidal. For the 2005 season, 270 permits for a five-day hunt are available (188 NM residents and 82 non-residents).

Many residents and nonresidents who initially think they are capable of hunting an area like the Valle Vidal rethink that idea once they see the expanse of this remarkable terrain. A single meadow that can take more than an hour to hike across is not the kind of place where one wants to pack out on ones own back something as large as an 800-pound bull elk. Several commercial outfitting operations exist now on the Valle Vidal. The Carson National Forest reports there are three elk-hunting operators and eight fishing-trip outfitters currently registered to use the property for at least a portion of their business. The New Mexico Council of Guides and Outfitters estimates these 11 businesses alone provide roughly $500,000 to the economic well-being of northern New Mexico.

"We estimate we provide services to roughly 15 percent of all those who draw licenses for the Valle Vidal," said John Boretsky, executive director for the Council. Each hunter using an outfitter pays an average of $4,500 to the outfitter. Boretsky estimates the money paid to elk-hunting outfitters therefore is $206,250.00. As these dollars cycle through the economies of the communities — for wages, groceries, fuel — their impact grows. The Council reports the "multiplier" for outfitted big game hunting is 1.749, meaning the outfitter income has an ultimate impact of $360,731.25[15].

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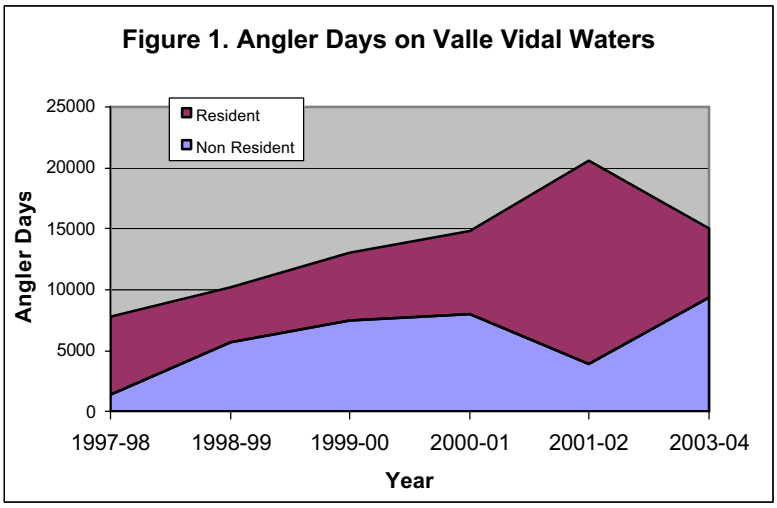
[14] U.S. Department of the Interion, Fish and Wildlife Service and U.S. Department of Commerce, U.S. Census Bureau. 2001 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation.
[15] Economic Contribution of Outdoor Recreation Industry in New Mexico – Professional Hunting Contribution, 2003

The guided hunting trips, however, only represent a portion of the recreational activity on the Valle Vidal. For example, if guided hunters take 15 percent of the 270 permits issued for the area each year, then do-it-yourself residents and nonresidents account for 233 of those licenses. In its 2001 National Survey of Fishing, Hunting and Wildlife-Associated Recreation, the U.S. Fish and Wildlife Service estimated each resident elk hunter spends $108 a day. The average nonresident hunter spends $92 each day.

Assuming that unguided resident hunters account for 215 elk licenses each season, and assuming they hunt four days, the dollars generated by them would be $92,880. The remaining 18 nonresident hunters would contribute $6,624. The multiplier for travel and tourism is typically between 1.5 and 2.5, meaning the true impact of those dollars is somewhere between $149,256 and $248,760[16]. Elk hunting on the Valle Vidal contributes more than a half million dollars to the economies of the communities and individuals surrounding the area.



Much the same can be said for fishing. From 1997-2003, an annual average of 5,000 individuals came to the Valle Vidal and fished 15,000 days. Statewide, NM resident anglers spent $82 each day of fishing and non-resident anglers spent $71, which represents over $1 million spent by anglers fishing on the Valle Vidal.

Business of several local fishing guides are based on fishing Valle Vidal streams. With an average cost of $350.00 a day for a guided fishing trip, Boretsky estimates the immediate dollars contributed by fishing on the Valle Vidal at $87,500. "The multiplier for fishing is 1.54, meaning that industry locally is worth about $134,750" [17] each year.

If development, such as coal bed methane drilling, were allowed on the Valle Vidal, the local community may see short-term gains in economic development. However, many of the jobs require skilled workers that are often filled by gas field workers from other areas[18]. Coal bed methane development can be relatively short-term in duration and often does not provide for long term support of local economic growth, leading to a boom and bust economy for the local community.

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[16] Avitourism in Texas, 1999.

[17] Economic Survey for Guided Fishing Along the San Juan River, 2004.

[18] The Local Economic Impacts of Natural Gas Development in Valle Vidal, New Mexico. A report prepared as comments to the Carson National Forest. Thomas Michael Power, Chair – Economics Department, University of Montana. January 2005.

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Undoubtedly, the attractiveness of the Valle Vidal for angling, hunting, and other outdoor recreation would be decreased with oil and gas development. It is difficult to project the long-term economic impacts to the local community if income from recreational activities were to decline, but it is not unreasonable to assume they would be substantial,

Section 6. Affidavit of Publication of Notice of the Petition

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Appendix 1: Stream Descriptions

Rio Costilla Watershed

Rio Costilla

There are two main sections of the Rio Costilla within the boundaries of Valle Vidal. The main stem of Rio Costilla flows through Costilla Reservoir, which is fully contained within Vermejo Park Ranch, approximately 6 miles through the Valle Vidal, and finally onto Rio Costilla Cooperative Livestock Association (RCCLA) property. Traditionally, water is not released from the reservoir between October and May. During the irrigation season (generally, May-September), flows in the Rio Costilla are highest during the week, when fields are being irrigated.

The Rio Costilla is the most visited water on the Valle Vidal, with an average of 7,700 angler days. Cutthroat trout, rainbow trout, and occasionally brown trout and brook trout can be caught in the Rio Costilla on the Valle Vidal. All fishing is catch and release with artificial flies and lures.

Other fish species that occupy the Rio Costilla include nonnative white sucker and native longnose dace. The mainstem of the Rio Costilla has been proposed for renovation as part of an effort to establish a "metapopulation" of Rio Grande cutthroat trout. This project would include the Rio Costilla and all of its tributaries from headwaters on

Vermejo Park Ranch to Latir Creek on RCCLA, encompassing nearly 200 miles of habitat. The completion of this project would help secure Rio Grande cutthroat trout into the future.

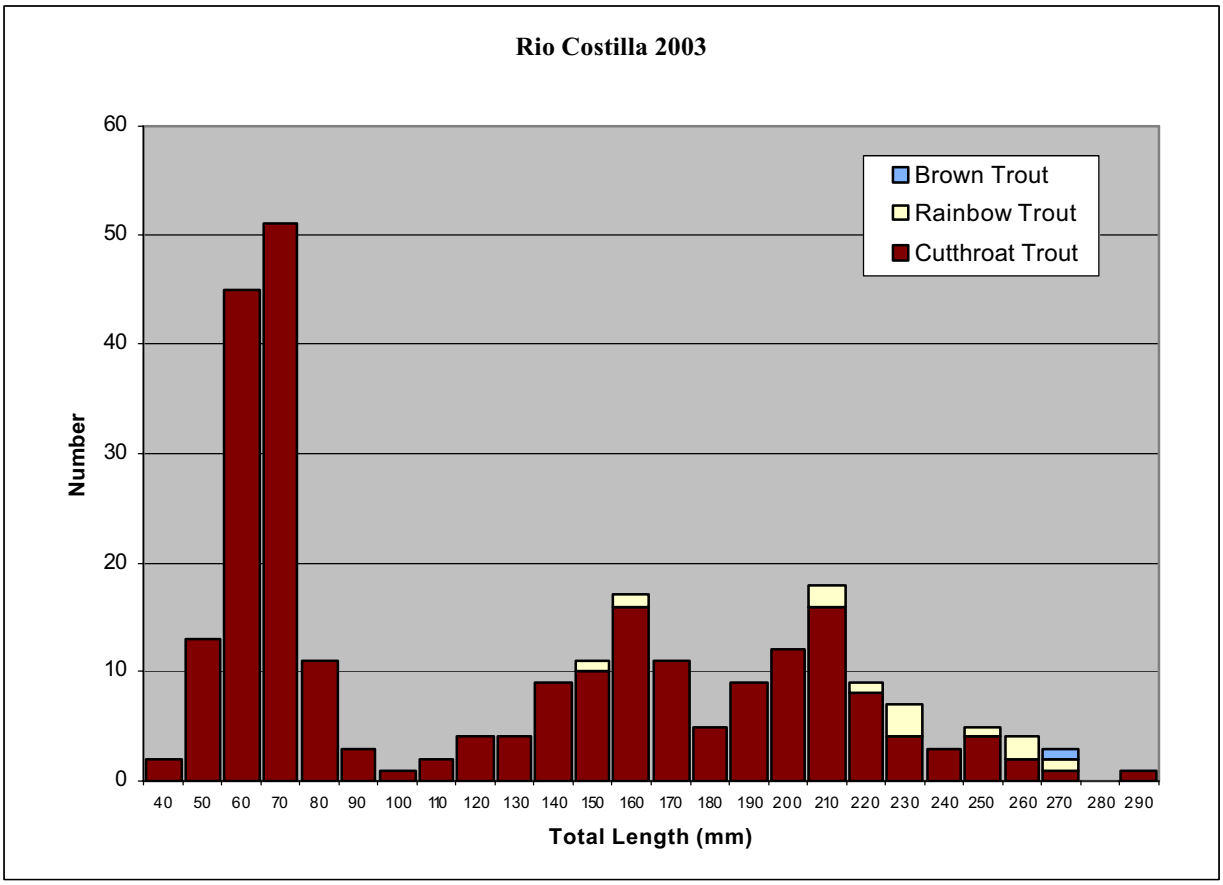

Figure 1-1. Size-structure of trout populations in Rio Costilla on the Valle Vidal, September 2003.

Comanche Creek

Comanche Creek and all of its tributaries are contained within the boundaries of the Valle Vidal. In total, the Comanche Creek drainage contains nearly 60 miles of stream. The upper portions, including Vidal Creek, contain pure Rio Grande cutthroat trout. White sucker and longnose dace are also found in the Comanche Creek drainage.

Since 1998, groups such as New Mexico Trout, Trout Unlimited, and the Quivera Coalition have been

working with Carson National Forest (and their permittees), New Mexico Department of Game and Fish, and the New Mexico Environment Department to improve fish habitats and water quality in Comanche Creek. Volunteer groups have assisted in the construction of several grazing exclosures and plantings to help establish woody vegetation along the creek. Additionally with help from an EPA 303d grant and a Watershed Implementation Plan, other projects have been completed to help decrease sedimentation from roads and headcuts in the drainage.

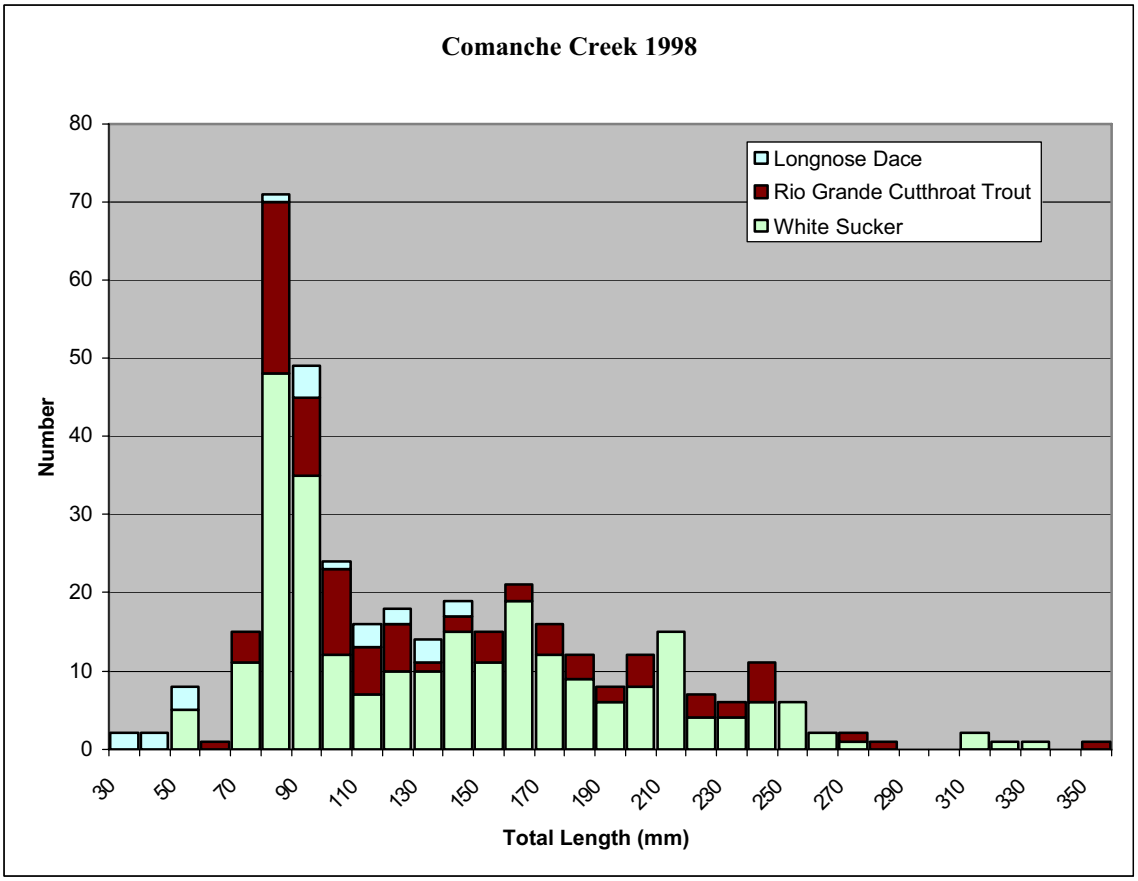

Figure 1-2. Size-structure of fish populations in Comanche Creek, summer 1998.

Powderhouse Creek

Powderhouse Creek is a small tributary to the Rio Costilla that flows in just below Costilla reservoir. Renovation of Powderhouse Creek for Rio Grande cutthroat trout was completed in 1997. Fintrol® (antimycin-A) was applied to the stream above a waterfall barrier to remove nonnative brook trout that were displacing pure native Rio Grande cutthroat. Following treatment, Rio Grande cutthroat trout were returned to the stream. The stream now supports about 2000 Rio Grande cutthroat trout per surface hectare. Angler use on this stream is about 100-angler days/year. Below the barrier brook trout as well as Rio Grande cutthroat trout are available to the angler. In total, Powderhouse creek has four miles of fish habitat, 3 of which are above the fish barrier.

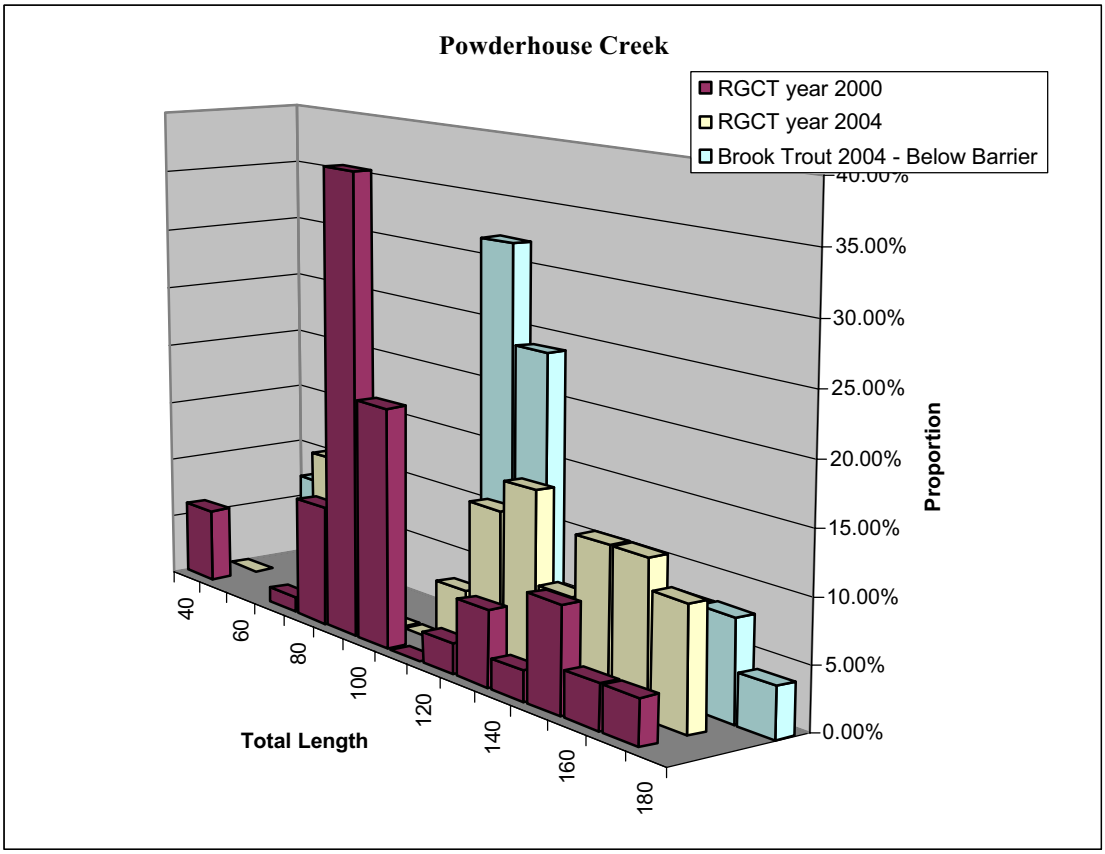

Figure 1-3. Size-structure of trout populations in captured in Powderhouse Creek, 2000 and 2004.

La Cueva Creek

La Cueva Creek is also a small tributary of the Rio Costilla, joining it about one mile upstream of the Comanche Creek confluence. This system also has Rio Grande cutthroat trout. La Cueva Creek has a very small width to depth ratio, with deep pools, which provide habitat for Rio Grande cutthroat trout. Few anglers venture up into this small canyon stream. On average 200 angler days are reported for La Cueva creek each year.

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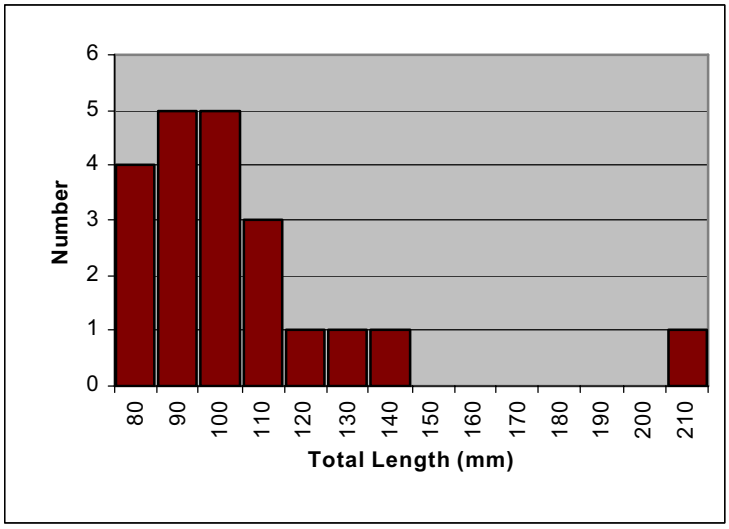

Figure 1-4. Size-structure of Rio Grande cutthroat trout population in La Cueva creek, July 2004.

North Ponil Drainage

The main headwater of North Ponil Creek is McCrystal Creek, which flows off Vermejo Park Ranch onto the Valle Vidal. The upper portions of McCrystal Creek contain a population of Rio Grande cutthroat trout. A popular campground near the creek provides access for hikers and anglers. On average, 150 angler days are spent fishing for the cutthroat trout in McCrystal Creek.

Lower in the drainage, North Ponil Creek contains populations of creek chub, longnose dace, and nonnative white sucker. Seally Canyon also contains creek chub. There are several ephemeral lakes associated with the North Ponil drainages. Packard's fairy shrimp, a rare species in New Mexico, occupy these lakes.

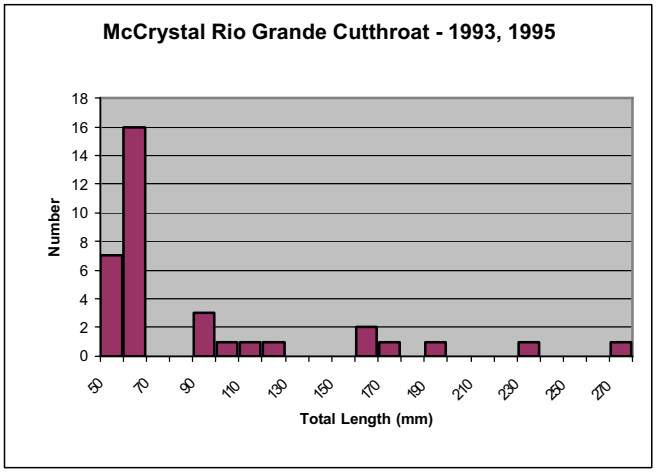

Figure1-5. Size-structure of Rio Grande cutthroat trout population in McCrystal Creek , 1993 and 1995.

Middle Ponil Drainage

Upper portions of Middle Ponil Creek, above Shuree Lakes, flow though a meadow off the east slope of Little Costilla Peak. This area contains a population of cutthroat x rainbow trout hybrids. Approximately 300 angler days are reported for this area.

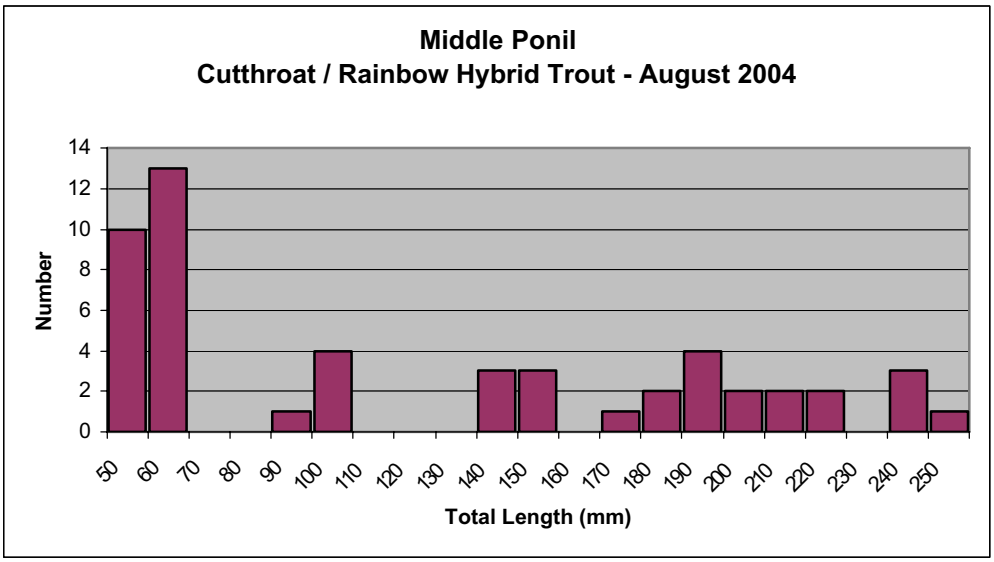

Figure 1-6.Size-structure of cutthroat x rainbow trout population in Middle Ponil Creek, August 2004.

Shuree Lakes are the second-most visited location for angling on the Valle Vidal. On average, 4,500 angler days are reported each year for those looking to catch stocked rainbow trout. This is the only water on the Valle Vidal where fish can be kept, the bag limit is two trout over 15". Shuree Lakes include three ponds ranging in size from 1 to 7 acres. All three ponds are stocked annually with trophy sized trout. One of the ponds is designated as a "kids pond" for anglers under 12 years of age.

Below Shuree Lakes, mainly cutthroat x rainbow trout are found. In the summer of 2002, the nearly 100,000 acre Ponil Complex Fire burned through the area. It is believed that all the fish below Greenwood canyon were killed by ash flows (J. Martinez, Carson N.F. pers. Com.).

Below the Valle Vidal boundary, Middle Ponil Creek flows onto Elliott Barker State Wildlife Area and Philmont Scout Ranch.

Other Waters

There are several waters on the Valle Vidal, including Bonita, Abreu, and Lookout canyons that have not been recently surveyed for fish. It is likely these waters are ephemeral and contain no fish; however, they may contain important habitat for aquatic invertebrates.

Leandro Creek

Valle Vidal contains the headwaters of Leandro Creek. Approximately three miles of stream are within Valle Vidal. After leaving Valle Vidal, the stream flows through Vermejo Park Ranch to its confluence with Vermejo River. In 1998, the portions of Leandro Creek on the Valle Vidal were renovated for Rio Grande cutthroat trout. Brook trout were removed using Fintrol® (antimycin-A) and Rio Grande cutthroat trout from Ricardo Creek (a nearby tributary to the Vermejo River) were released into the renovated stream. A constructed waterfall barrier, just upstream of Vermejo Park Ranch, prevents movement of nonnative brook trout back into Rio Grande cutthroat trout habitat

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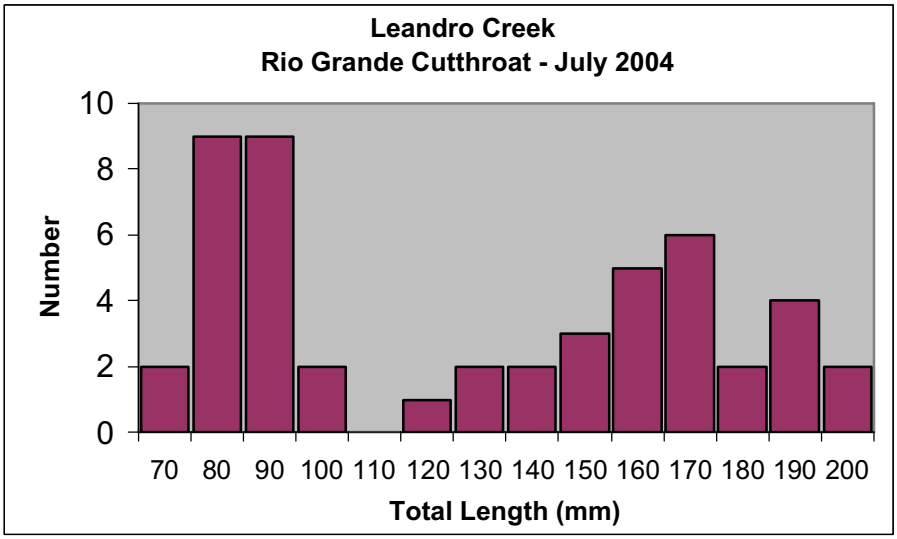

Figure 1-7. Size-structure of Rio Grande cutthroat trout population in Leandro Creek, July 2004.

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Appendix 2. Lists of Wildlife Species.

Table 2-1. List of native vertebrate wildlife species found on the Valle Vidal.
** Species likely to be impacted by reduction in water quality/quantity, and associated impacts on mesic and riparian habitats.
*Species that could potentially be impacted by reduction in water quality/quantity, and associated impacts on mesic and riparian habitats.

Common Name	Species	Status
Fish		
**Rio Grande cutthroat trout	*Oncorhynchus clarki virginalis*	Sensitive/Species of Concern
**Creek chub	*Semotilus atromaculatus*	
**Long nosed dace	*Rhinichthys cataractae*	
Amphibians		
**Tiger salamander	*Ambystoma tigrinum*	
**Chorus frog	*Pseudacris triseriata*	
**Northern leopard frog	*Rana pipiens*	Sensitive
Reptiles		
Mountain short-horned lizard	*Phrynosoma hernandesi*	
Fence lizard	*Sceloporus undulatus*	
Plateau striped whiptail	*Cnemidophorus velox*	
Many-lined skink	*Eumeces multivirgatus*	
Racer	*Coluber constrictor*	
Ringneck snake	*Diadophis punctatus*	
Hognose snake	*Heterodon nasicus*	
Smooth green snake	*Liochlorophis vernalis*	
Bullsnake	*Pituophis catenifer*	
**Blackneck garter snake	*Thamnophis cyrtopsis*	
**Wandering garter snake	*Thamnophis elegans*	
**Plains garter snake	*Thamnophis radix*	
Prairie rattlesnake	*Crotalus viridis*	
Birds		
**Bald Eagle	*Haliaeetus leucocephalus*	Federally Threatened
*Peregrine Falcon	*Falco peregrinus anatum*	State Threatened
Boreal Owl	*Aegolius funereus*	State Threatened
*Northern Goshawk	*Accipiter gentilis*	Sensitive/Species of Concern
Mexican Spotted Owl	*Strix occidentalis lucida*	Federally Threatened
Mammals		
*Masked Shrew	*Sorex cinereus*	
*Montane Shrew	*Sorex monticolus*	
Merriam's Shrew	*Sorex merriami*	
**Water Shrew	*Sorex palustris*	
*Little Brown Myotis Bat	*Myotis lucifugus*	Sensitive
*Long-eared Myotis	*Myotis evotis*	Sensitive
*Fringed Myotis	*Myotis thysanodes*	Sensitive
*Long-legged Myotis	*Myotis volans*	Sensitive
*Western Small-footed Myotis	*Myotis ciliolabrum*	Sensitive
*Silver-haired Bat	*Lasionycteris noctivagans*	

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Table 2-1. Continued – list of native vertebrate wildlife species of the Valle Vidal.

Common Name	Species	Status
*Big Brown Bat	*Eptesicus fuscus*	
*Hoary Bat	*Lasiurus cinereus*	
*Townsend's Big-eared Bat	*Corynorhinus townsendi*	
Pika	*Ochotona princeps*	
Mountain Cottontail	*Sylvilagus nuttalli*	
Snowshoe Hare	*Lepus americana*	
Least Chipmunk	*Neotamias minimus*	
Colorado Chipmunk	*Neotamias quadrivittatus*	
Yellow-bellied Marmot	*Marmota flaviventris*	Sensitive
Thirteen-lined Ground Squirrel	*Spermophilus tridecemlineatus*	
Spotted Ground Squirrel	*Spermophilus spilosoma*	
Rock Squirrel	*Spermophilus variegatus*	
Golden-mantled Ground Squirrel	*Spermophilus lateralis*	
Gunnison's Prairie Dog	*Cynomys gunnisoni*	Sensitive
Abert's Squirrel	*Sciurus aberti*	
Red Squirrel	*Tamiasciurus hudsonicus*	
Botta's Pocket Gopher	*Thomomys bottae*	
Northern Pocket Gopher	*Thomomys talpoides*	Sensitive
**Beaver	*Castor canadensis*	
Deer Mouse	*Peromyscus maniculatus*	
Brush Mouse	*Peromyscus boylii*	
Rock Mouse	*Peromyscus difficilis*	
Mexican Woodrat	*Neotoma mexicana*	
Bushy-tailed Woodrat	*Neotoma cinerea*	
*Gapper's Red-backed Vole	*Clethrionomys gapperi*	
*Heather Vole	*Phenacomys intermedius*	Sensitive
*Meadow Vole	*Microtus pennsylvanicus*	
*Long-tailed Vole	*Microtus longicaudus*	
**Muskrat	*Ondatra zibethicus*	
**Western Jumping Mouse	*Zapus princeps*	
Porcupine	*Erethizon dorsatum*	
Coyote	*Canis latrans*	
Gray Fox	*Urocyon cinereoargenteus*	
Black Bear	*Ursus americanus*	
*Raccoon	*Procyon lotor*	
American Marten	*Martes americana*	State Threatened
Ermine	*Mustela erminea*	
Long-tailed Weasel	*Mustela frenata*	
**Mink	*Mustela vison*	
Badger	*Taxidea taxus*	
Striped Skunk	*Mephitis mephitis*	
Mountain Lion	*Felis concolor*	
Bobcat	*Felis rufus*	
*Elk	*Cervus elaphus*	
*Mule Deer	*Odocoileus hemionus*	

Table 2-2. Aquatic invertebrates known to exist in the waters of the Valle Vidal.

Order	Family	Taxa	Costilla	Middle Ponil	North Ponil
AMPHIPODA	Hyalellidae	*Hyalella azteca*	x		
AMPHIPODA	Hyalellidae			x	
ANNELIDA		*Lumbricus aquaticus*	x		
ANNELIDA	Hirudinea		x		
ANNELIDA	Nematoda		x		
ANNELIDA	Oligocheaeta		x		
ANNELIDA	Tubificidae		x		x
ARACHNIDA	Trombidiformes		x		
BASOMMATOPHORA	Planorbidae	*Gyraulus sp.*		x	
BASOMMATOPHORA	Lymnaeidae	*Lymnaea* sp.	x		
BASOMMATOPHORA	Physidae	*Physella*		x	
BASOMMATOPHORA	Lymnaeidae			x	
BRACHIOPODA		*Branchinecta packardi*		x	x
BRACHIOPODA		*Eubranchipus bundyi*	x		
COLEOPTERA	Dytiscidae	*Agabus sp.*	x		
COLEOPTERA	Elmidae	*Cleptelmis sp.*	x		
COLEOPTERA	Haliplidae	*Haliplus sp.*		x	
COLEOPTERA	Dryopidae	*Helichus sp.*	x		x
COLEOPTERA	Elmidae	*Heterlimnius sp.*	x	x	
COLEOPTERA	Hydraenidae	*Hydraena sp.*	x		
COLEOPTERA	Elmidae	*Narpus sp.*	x		
COLEOPTERA	Elmidae	*Optioservus sp.*	x	x	x
COLEOPTERA	Elmidae	*Zaitzevia parvula*	x		
COLEOPTERA	Elmidae	*Zaitzevia sp.*		x	
COLEOPTERA	Curculionidae		x		
COLEOPTERA	Dryopidae			x	
COLEOPTERA	Elmidae			x	
COLEOPTERA	Hydrophilidae		x		
COLEOPTERA				x	
COLLEMBOLA			x		
DIPTERA	Ceratopogonidae	*Probezzia sp*		x	
DIPTERA	Bephariceridae	*Agathon sp.*	x		
DIPTERA	Tipulidae	*Antocha*		x	
DIPTERA	Tipulidae	*Antocha monticola*	x		
DIPTERA	Athericidae	*Atherix sp.*	x		
DIPTERA	Ceratopogonidae	*Atrichopogon sp.*	x		
DIPTERA	Ceratopogonidae	*Bezzia sp.*	x	x	x
DIPTERA	Empididae	*Chelifera*		x	
DIPTERA	Empididae	*Chelifera sp.*	x		

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Table 2-2 cont. Aquatic invertebrates known to exist in the waters of the Valle Vidal.

Order	Family	Taxa	Costilla	Middle Ponil	North Ponil
DIPTERA	Chironomidae	*Chironominae sp.*	x	x	
DIPTERA	Tabanidae	*Chrysops*		x	
DIPTERA		*Culicoides sp.*	x		
DIPTERA		*Dicanota sp.*	x		x
DIPTERA	Tipulidae	*Dicranota sp.*	x	x	
DIPTERA		*Eukiefferiella sp.*			x
DIPTERA	Tipulidae	*Hexatoma sp.*	x	x	
DIPTERA	Tipulidae	*Holorusia grandis*	x		
DIPTERA	Muscidae	*Limnophora sp.*	x		
DIPTERA	Tipulidae	*Limonia sp.*		x	
DIPTERA	Empididae	*Oreogeton sp.*	x		
DIPTERA	Tipulidae	*Ormosia*		x	
DIPTERA	Chironomidae	*Orthocladius sp.*	x	x	x
DIPTERA	Psychodidae	*Pericoma sp.*	x	x	
DIPTERA	Ceratopogonidae	*Probezzia sp.*	x		
DIPTERA	Simuliidae	*Prosimulinum sp.*	x		
DIPTERA	Simuliidae	*Simuliidae sp.*	x		
DIPTERA	Simuliidae	*Simulinum sp.*	x	x	
DIPTERA	Simuliidae	*Simulium vittatum*	x		
DIPTERA	Tabanidae	*Tabanus sp.*		x	
DIPTERA	Chironomidae	*Tanypodinae sp.*	x	x	
DIPTERA	Tipulidae	*Tipula sp.*	x		
DIPTERA	Empididae	*Trichoclinocera sp.*	x		
DIPTERA		*Tvetenia sp.*			x
DIPTERA	Chironomidae			x	
DIPTERA	Dixidae		x		
DIPTERA	Simuliidae			x	
DIPTERA	Stratiomyidae		x		
EPHEMEROPTERA	Baetidae	*Acentrella insignificans*			x
EPHEMEROPTERA	Baetidae	*Acentrella sp.*	x		
EPHEMEROPTERA	Ameletidae	*Ameletus sp.*	x	x	
EPHEMEROPTERA	Ephemerellidae	*Attenella margarita*	x		
EPHEMEROPTERA	Baetidae	*Baetis sp.*	x	x	
EPHEMEROPTERA	Baetidae	*Baetis tricaudatus*			x
EPHEMEROPTERA	Heptageniidae	*Cinygmula sp.*	x	x	
EPHEMEROPTERA	Ephemerellidae	*Drunella coloradensis*	x		
EPHEMEROPTERA	Ephemerellidae	*Drunella doddsi*	x		
EPHEMEROPTERA	Ephemerellidae	*Drunella doddsi*		x	
EPHEMEROPTERA	Ephemerellidae	*Drunella grandis*	x		
EPHEMEROPTERA	Ephemerellidae	*Drunella sp.*		x	x

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Table 2-2 cont. Aquatic invertebrates known to exist in the waters of the Valle Vidal.

Order	Family	Taxa	Costilla	Middle Ponil	North Ponil
EPHEMEROPTERA	Heptageniidae	*Epeorus sp.*	x		
EPHEMEROPTERA	Ephemerellidae	*Ephemerella inermis*	x		x
EPHEMEROPTERA	Ephemerellidae	*Ephemerella infrequens*	x		
EPHEMEROPTERA	Ephemerellidae	*Ephemerella sp.*		x	
EPHEMEROPTERA	Heptageniidae	*Leucrocuta sp.*	x		
EPHEMEROPTERA		*Nixe sp.*			x
EPHEMEROPTERA	Leptophlebiidae	*Paralptophlebia sp.*	x		
EPHEMEROPTERA	Heptageniidae	*Rhithrogena sp.*		x	
EPHEMEROPTERA	Heptageniidae	*Rithrogena hageni*	x		
EPHEMEROPTERA		*Ticorythodes sp.*			x
EPHEMEROPTERA	Ephemerellidae	*Timpanoga hecuba*	x		
EPHEMEROPTERA	Ephemerellidae			x	
EPHEMEROPTERA	Heptageniidae			x	
EPHEMEROPTERA	Leptophlebiidae		x		
HAPLOTAXIDA	Tubificidae			x	
HEMIPTERA	Gerridae		x		
HETEROPTERA	Corixidae			x	
LEPIDOPTERA			x		
LUMBRICULIDA	Lumbriculidae			x	
ODANATA	Gomphidae	*Ophiogomphus sp.*	x	x	x
PLECOPTERA	Perlodidae	*Alloperla severa*			x
PLECOPTERA	Nemouridae	*Amphinemura banksi*			x
PLECOPTERA	Nemouridae	*Amphinemura sp.*	x		
PLECOPTERA		*Classinia sabulosa*	x		
PLECOPTERA	Perlodidae	*Cultus sp.*	x		
PLECOPTERA	Perlidae	*Hesperoperla pacifica*	x	x	x
PLECOPTERA	Perlodidae	*Isoperla sp.*	x		x
PLECOPTERA	Nemouridae	*Malenka*		x	
PLECOPTERA	Perlodidae	*Megarcys signata*	x		
PLECOPTERA		*Paraleuctra sp.*	x		
PLECOPTERA	Pteronarcyidae	*Pteronarcella badia*	x		x
PLECOPTERA	Pteronarcyidae	*Pteronarcella sp.*		x	
PLECOPTERA	Pteronarcyidae	*Pteronarcys sp.*	x		
PLECOPTERA	Perlodidae	*Skwala paralella*	x		
PLECOPTERA	Chloroperlidae	*Suwallia*	x		
PLECOPTERA	Chloroperlidae	*Sweltsa* sp.	x	x	
PLECOPTERA	Chloroperlidae	*Triznaka sp.*	x		
PLECOPTERA	Nemouridae	*Zapada sp.*	x	x	
PLECOPTERA	Capniidae		x		

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Table 2-2 cont. Aquatic invertebrates known to exist in the waters of the Valle Vidal.

Order	Family	Taxa	Costilla	Middle Ponil	North Ponil
PLECOPTERA	Capniidae			x	
PLECOPTERA	Nemouridae			x	
PLECOPTERA	Perlodidae			x	x
PODOCOPIDA			x	x	
TRICHOPTERA	Glossosomatidae	*Agapetus sp.*	x		
TRICHOPTERA	Glossosomatidae	*Anagapetus sp.*	x		
TRICHOPTERA	Hydropsychidae	*Arctopsyche sp.*	x	x	
TRICHOPTERA	Brachycentridae	*Brachycentrus sp.*	x	x	
TRICHOPTERA		*Ceraclea sp.*			x
TRICHOPTERA	Hydropsychidae	*Cheumatophyche sp.*	x		x
TRICHOPTERA	Limnephilidae	*Dicosmoecus sp.*	x	x	
TRICHOPTERA	Philopotamidae	*Dolophilodes sp.*	x		
TRICHOPTERA	Limnephilidae	*Ecclisomyia sp.*	x		
TRICHOPTERA	Glossosomatidae	*Glossosoma sp.*	x	x	
TRICHOPTERA	Hydropsychidae	*Helicopsyche borealis*	x		
TRICHOPTERA	Hydropsychidae	*Helicopsyche sp.*			x
TRICHOPTERA	Limnephilidae	*Hesperophylax sp.*	x	x	
TRICHOPTERA	Hydropsychidae	*Hydropsyche oslari*			x
TRICHOPTERA	Hydropsychidae	*Hydropsyche sp.*	x	x	
TRICHOPTERA	Hydroptilidae	*Hydroptila sp.*	x		
TRICHOPTERA	Lepidostomatidae	*Lepidostoma sp.*	x	x	
TRICHOPTERA	Limnephilidae	*Limnephilus sp.*	x		
TRICHOPTERA	Brachycentridae	*Micrasema* sp.	x	x	x
TRICHOPTERA	Uenoidae	*Neophylax sp.*	x		
TRICHOPTERA	Uenoidae	*Neothremma sp.*	x		
TRICHOPTERA	Hydroptilidae	*Ochrotrichia* sp.	x		x
TRICHOPTERA	Leptoceridae	*Oecetis sp.*	x		
TRICHOPTERA	Uenoidae	*Oligophlebodes* sp.	x	x	
TRICHOPTERA	Hydropsychidae	*Parapsyche sp.*	x		
TRICHOPTERA	Limnephilidae	*Psychoglypha sp.*	x		
TRICHOPTERA	Rhyacophilidae	*Rhyacophila brunea cpx.*	x		
TRICHOPTERA	Rhyacophilidae	*Rhyacophila hyalinata*	x		
TRICHOPTERA	Rhyacophilidae	*Rhyacophila sp.*		x	
TRICHOPTERA	Hydropsychidae			x	
TRICHOPTERA	Leptoceridae			x	
TRICHOPTERA	Limnephilidae			x	
TRICHOPTERA				x	
TROMBIDIFORMES			x		
TROMBIDIFORMES				x	
VENEROIDEA	Pisidiidae	*Pisidiums sp.*	x		
VENEROIDEA	Pisidiidae			x	

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Appendix 3. Water Quality Data.

Table 3-1. Water quality monitoring sites in the Valle Vidal.

Station Name	Study Yr	Longitude	Latitude
Middle Ponil Creek @FR 1950	1989	-105.2136	36.7764
Middle Ponil Creek @FR 1950	1998		
North Ponil Creek @ FR 1950	1989	-105.0983	36.7756
North Ponil Creek @ FR 1950	1998		
Middle Ponil above South Ponil Creek	1989	-105.0381	36.6222
Middle Ponil above South Ponil Creek	1998		
North Ponil Creek above Ponil Creek	1989	-104.9656	36.5881
North Ponil Creek above Ponil Creek	1998		
Ponil Creek @ USGS gage	1989	-104.9464	36.5733
Ponil Creek @ USGS gage	1998		
Comanche Creek below Exposure*	2000	-105.2753	36.7792
Comanche Creek above Costilla Creek*	1989	-105.3186	36.8319
Comanche Creek above Costilla Creek	2000		
Costilla Creek above Comanche Creek*	1989	-105.3162	36.8326
Costilla Creek above Comanche Creek	2000		
Costilla Creek below Comanche Creek	1989	-105.3194	36.8319
Costilla Creek below Comanche Creek	2000		

*Temperature and Turbidity measurements taken 4 times/year 1990 to 1995

Table 3-2. Exceedence ratios (the number of exceedences of the water quality criteria divided by the total number of samples taken). Shaded cells indicate ratios >0.15.

Station Name	Study	Temp.	Turbidity	PH	Diss Al	TOC	TP	DO
Applicable standard		>23°C	25 NTU	>8.8or <6.6	hardness dependent		0.10mg/L	<6
Middle Ponil Creek @FR 1950	1989	0/5	0/5	0/5	NA	0/1	3/5	0/4
Middle Ponil Creek @FR 1950	1998	0/10	4/10	0/10	NA	0/6	0/6	0/10
North Ponil Creek @ FR 1950	1989	0/5	0/5	0/5	1/4	0/1	1/6	0/4
North Ponil Creek @ FR 1950	1998	0/10	7/10	0/10	NA	2/6	1/6	0/10
Middle Ponil above South Ponil Creek	1989	0/5	0/5	0/5	NA	0/1	0/5	0/4
Middle Ponil above South Ponil Creek	1998	0/10	6/10	0/10	NA	2/6	0/7	0/10
North Ponil Creek above Ponil Creek	1989	1/5	0/5	0/5	NA	0/1	0/5	0/4
North Ponil Creek above Ponil Creek	1998	0/10	6/10	0/10	NA	2/5	1/6	0/10
Ponil Creek @ USGS gage	1989	2/5	0/5	0/5	NA	0/1	0/5	0/4
Ponil Creek @ USGS gage	1998	0/10	6/10	0/10	6/8	1/6	0/7	0/10
Comanche Creek below Exposure	2000	0/8	0/8	0/8	0/8	0/7	0/8	0/8
Comanche Creek above Costilla Creek	1989	0/2	NA	1/2	NA	NA	0/2	NA
Comanche Creek above Costilla Creek	2000	0/8*	0/8	0/8	0/8	0/7	0/8	0/8
Costilla Creek above Comanche Creek	1989	0/3	0/1	0/3	NA	NA	0/4	0/1
Costilla Creek above Comanche Creek	2000	0/8*	0/8	0/8	1/8	0/7	0/8	0/8
Costilla Creek below Comanche Creek	1989	0/4	0/4	0/4	NA	NA	0/4	0/4
Costilla Creek below Comanche Creek	2000	0/8	0/8	0/8	1/8	0/7	0/8	0/8

* While grab samples did not show exceedences, thermographs deployed in 2002 and 2003 did.

Table 3-3. Summary of select water quality parameters from Costilla watershed. Shaded values exceed the applicable criteria.

Station Name	Date	Time	Temp. (°C)	D.O. (mg/L)	Total N (mg/L)	Total P (mg/L)	Turbidity (NTU)	Dissolved Aluminum (ug/L)
COMANCHE CREEK- above Costilla Creek	12-Sep-86	1645	17.5		0.14	0.02	2.50	
	14-Sep-86	1310	15.5		0.14	0.02	2.70	
	21-Aug-87	1135	17.0		0.18	0.02	2.70	
	11-Oct-87	1035	7.5		0.38	0.01	0.90	
	17-Jun-89	1315	18.0		0.17	0.06	3.00	
	29-Aug-89	1240	17.5		0.27	0.01	4.00	
	28-Mar-90	1050	3.0		0.83	0.12	8.70	
	31-May-90	1500	17.0		0.53	0.04	5.00	
	17-Jul-90	1250	18.0		0.26	0.01	3.20	50.00
	19-Sep-90	1350	17.0		0.17	0.01	4.00	300.00
	1-May-91	1235	8.0	9.60	0.31	0.08	6.50	400.00
	29-Jul-91	1245	13.9	7.50	0.50	0.02	4.00	100.00
	24-Oct-91	1240	8.5	8.80	0.36	0.03	2.70	100.00
	15-Apr-92	1140	4.1	12.10	1.20	0.09	29.00	1600.00
	29-Jul-92	1410	20.0	8.80	0.26	0.03	4.55	
	23-Oct-92	945	3.0	11.40	0.14	0.01	3.10	
	21-Sep-93	1800	15.0	7.10		0.09	2.40	0.10
	19-Oct-93	1500	9.0			0.09	3.29	
	28-Oct-93	1145	3.0			0.09	24.60	
	6-May-94	1200	9.0	8.10		0.09	22.20	1.00
	3-Jun-94	1045	12.0				7.80	
	18-Jun-94	1347	18.0				5.40	
	10-Nov-94	1325	1.0				5.80	
	12-Jun-95	1405	11.0				13.50	
	6-Jul-95	1745	19.5				8.27	
	28-Sep-95	1311	8.0				4.40	
COSTILLA CREEK - above Comanche Creek	12-Sep-86	1650	17.8		0.14	0.01	2.40	
	14-Sep-86	1315	15.8		0.25	0.01	2.70	
	31-Mar-87	1345	8.2	9.00	0.17	0.01		
	1-Apr-87	900			0.21	0.03		
	21-Aug-87	1145	17.8		0.51	0.06	7.90	
	11-Oct-87	1040	6.0		0.18	0.01	0.40	
	28-Mar-90	1050	6.0		0.55	0.04	5.30	
	31-May-90	1150	12.8		0.56	0.05	10.00	
	17-Jul-90	1210	18.0		0.42	0.63	3.70	60.00
	19-Sep-90	1245	15.0		0.24	0.05		300.00
	1-May-91	1125	5.0	10.10	0.33	0.09	11.50	600.00
	29-Jul-91	1155	16.0	7.00	0.23	0.05	4.80	200.00
	24-Oct-91	1145	6.7	8.70	0.35	0.03	2.10	100.00
	15-Apr-92	1110	6.0	12.50	0.52	0.10	11.00	900.00
	15-Apr-92	1111	6.0	12.50	0.58	0.07	11.00	900.00

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Table 3-3 cont. Summary of select water quality parameters from Costilla watershed. Shaded values exceed the applicable criteria.

Station Name	Date	Time	Temp. (°C)	D.O. (mg/L)	Total N (mg/L)	Total P (mg/L)	Turbidity (NTU)	Dissolved Aluminum (ug/L)
COSTILLA CREEK - above Comanche Creek	29-Jul-92	1310	17.0	8.50	0.15	0.03	6.20	
	22-Oct-92	1345	8.0	9.10	0.14	0.01	0.90	
	22-Oct-92	1346	8.0	9.10	0.15	0.01	0.90	
	21-Sep-93	1645						0.10
	22-Sep-93	1300	17.0	7.20			0.68	
	4-Oct-93	1350				0.09		
	19-Oct-93	1430	10.0			0.09	0.63	
	6-May-94	1000						0.60
	6-May-94	1310	12.0	7.40		0.09	22.80	
	3-Jun-94	1450	13.0				10.10	
	10-Nov-94	1215	2.0				1.20	
	13-Jun-95	1120	12.0				7.90	
	7-Jul-95	1245	18.0				5.10	
	29-Sep-95	1030	11.0				8.20	
UPPER COMANCHE CRK	17-Jun-89	1245	19.0		0.25	0.09	6.00	
	29-Aug-89	1145	11.0		0.30	0.01	7.00	
	28-Mar-90	1005	2.0		0.97	0.13	9.00	
	31-May-90	1415	17.5		0.57	0.04	5.80	
	17-Jul-90	1345	19.0		0.46	0.07	6.80	60.00
	19-Sep-90	1435	18.8		0.34	0.09	7.00	30.00
	1-May-91	1325	10.2	8.10	0.33	0.14	7.10	400.00
	29-Jul-91	1350	13.0	6.90	0.53	0.05	15.00	100.00
	24-Oct-91	1315	8.5	8.80	0.27	0.06	5.40	100.00
	15-Apr-92	1240	5.9	11.60	0.85	0.15	28.00	800.00
	29-Jul-92	1500	20.0	8.20	0.60	0.05	13.50	
	23-Oct-92	1220	7.5	10.30	0.15	0.02	7.20	
	21-Sep-93	1600		7.90			16.00	0.10
	6-May-94	930	4.0	8.70		0.09	15.40	0.80
	3-Jun-94	940	11.0				6.10	
	18-Jun-94	1230	18.0				9.30	
	26-Aug-94	920					17.50	
	10-Nov-94	1610	0.9				8.30	
	12-Jun-95	1710	20.0				10.30	
	6-Jul-95	1820	20.0				8.00	
	28-Sep-95	1625	10.0				197.00	

Table 3-4. Summary of select water quality parameters Ponil watershed. Shaded cells indicate exceedence of the water quality criteria.

Station Name	Date	Time	Temp. (°C)	D.O. (mg/L)	Total N (mg/L)	Total P (mg/L)	Turbidity (NTU)	Diss. Al (UG/L)
PONIL CREEK AT NM 58	11-Sep-89	1410	14.00	8.50	0.30	0.14	28.00	
	12-Sep-89	925	11.90	8.60	0.27	0.21	44.00	
	12-Sep-89	1220	12.20	8.80	0.37	0.21	50.50	
	13-Sep-89	925	9.90	9.00	0.69	1.01	260.00	
	13-Sep-89	1245	12.40	8.80	0.63	0.90	272.00	
	11-May-98	1735	18.10	7.05			98.20	
	12-May-98	1440	15.60	7.60			112.00	
	13-May-98	1150	12.80	8.20			88.00	
	14-May-98	1410	15.90	7.80			104.00	
	28-Jul-98	1505	23.90	6.60	0.90	0.07	86.50	
	29-Jul-98	1350	26.80	8.30	0.62	0.05	48.80	
	6-Oct-98	1520	13.10	10.10	0.22	0.16	16.60	
	7-Oct-98	1540	16.90	8.90	0.45	0.05	17.80	10.00
PONIL CREEK AT USGS GAGE	5-Jun-89	1225	19.00	7.90	0.20	0.02	15.00	
	6-Jun-89	1905	20.90	6.80	0.14	0.01	4.40	
	7-Jun-89	1305	23.50	7.30	0.14	0.01	3.90	
	7-Jun-89	1510	23.10	6.90	0.14	0.02	3.80	
	8-Jun-89	1135	20.20		0.26	0.02	7.20	
	11-May-98	1640	15.70	7.80			43.40	160.00
	12-May-98	1150	9.60	9.25			46.00	700.00
	13-May-98	1525	15.70	7.60			41.10	200.00
	14-May-98	1130	11.40	8.60			52.10	40.00
	28-Jul-98	1415	20.50	7.00	1.20	0.09	99.40	110.00
	29-Jul-98	1250	21.50	7.60	0.30	0.05	56.90	90.00
	6-Oct-98	1415	12.20	8.20	0.25	0.05	5.86	10.00
	7-Oct-98	1400	13.20	8.50	0.37	0.05	4.60	10.00
	7-Oct-98	1500	14.70	9.40	0.29	0.05	9.03	
NORTH PONIL CREEK - ABOVE PONIL CREEK	5-Jun-89	1350	22.80	7.30	0.14	0.04	13.00	
	6-Jun-89	1850	19.90	6.70	0.14	0.01	4.60	
	7-Jun-89	1320	24.10	7.00	0.14	0.01	5.30	
	7-Jun-89	1450	23.00	6.80	0.14	0.01	5.70	
	11-May-98	1500	18.60	7.40			85.40	
	12-May-98	1220	13.10	8.15			148.00	
	13-May-98	1510	18.90	6.90			135.00	
	14-May-98	1210	14.60	7.90			219.00	
	28-Jul-98	1320	21.00	6.90	1.30	0.28	224.00	
	29-Jul-98	1230	21.90	7.60	0.60	0.09	117.00	
	6-Oct-98	1350	11.50	8.60	0.31	0.05	9.04	
	7-Oct-98	1330	12.40	8.70	0.36	0.05	13.60	

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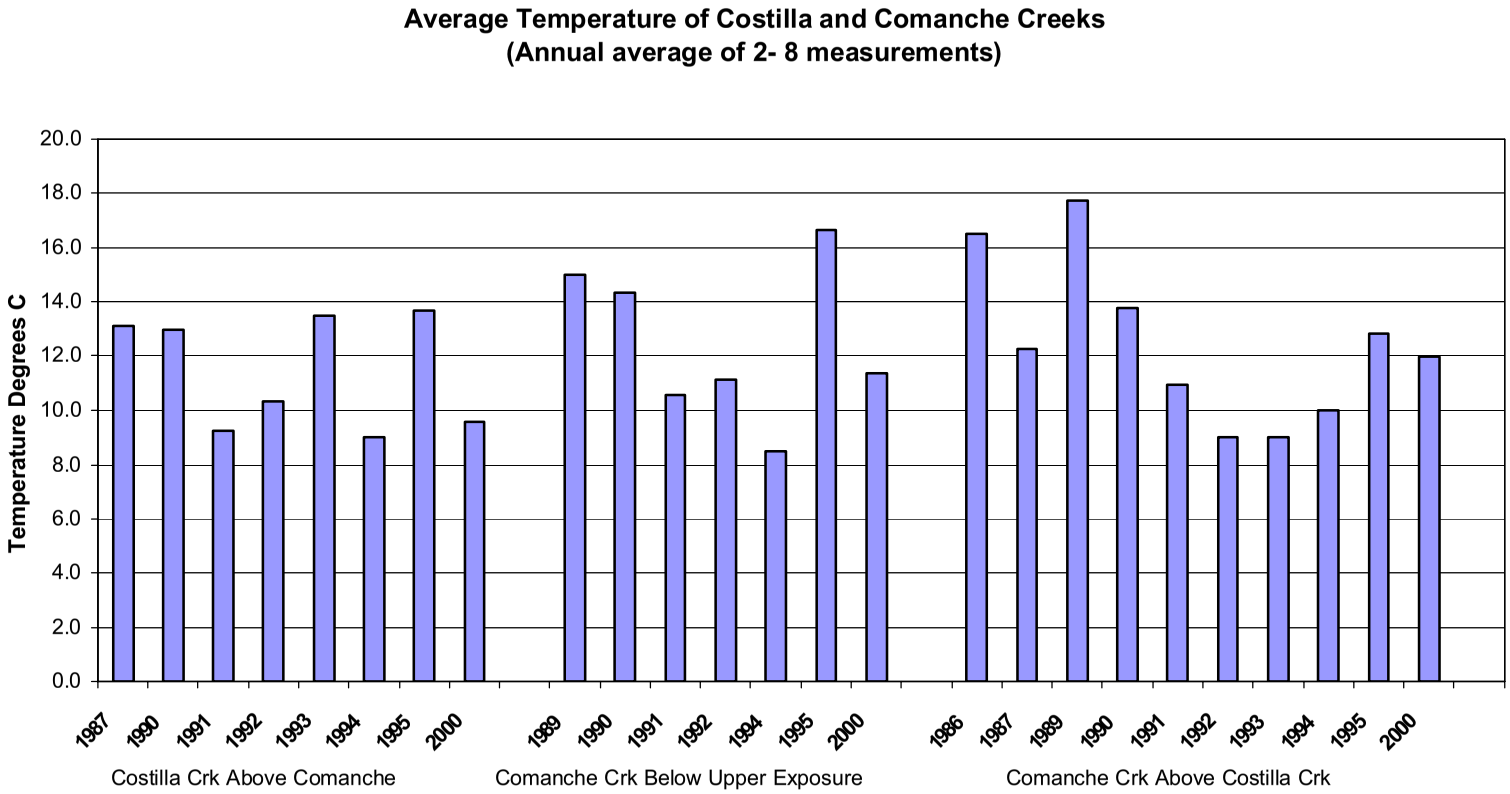

Figure 3-1. Average temperature collected in grab samples in Costilla and Comanche Creeks.

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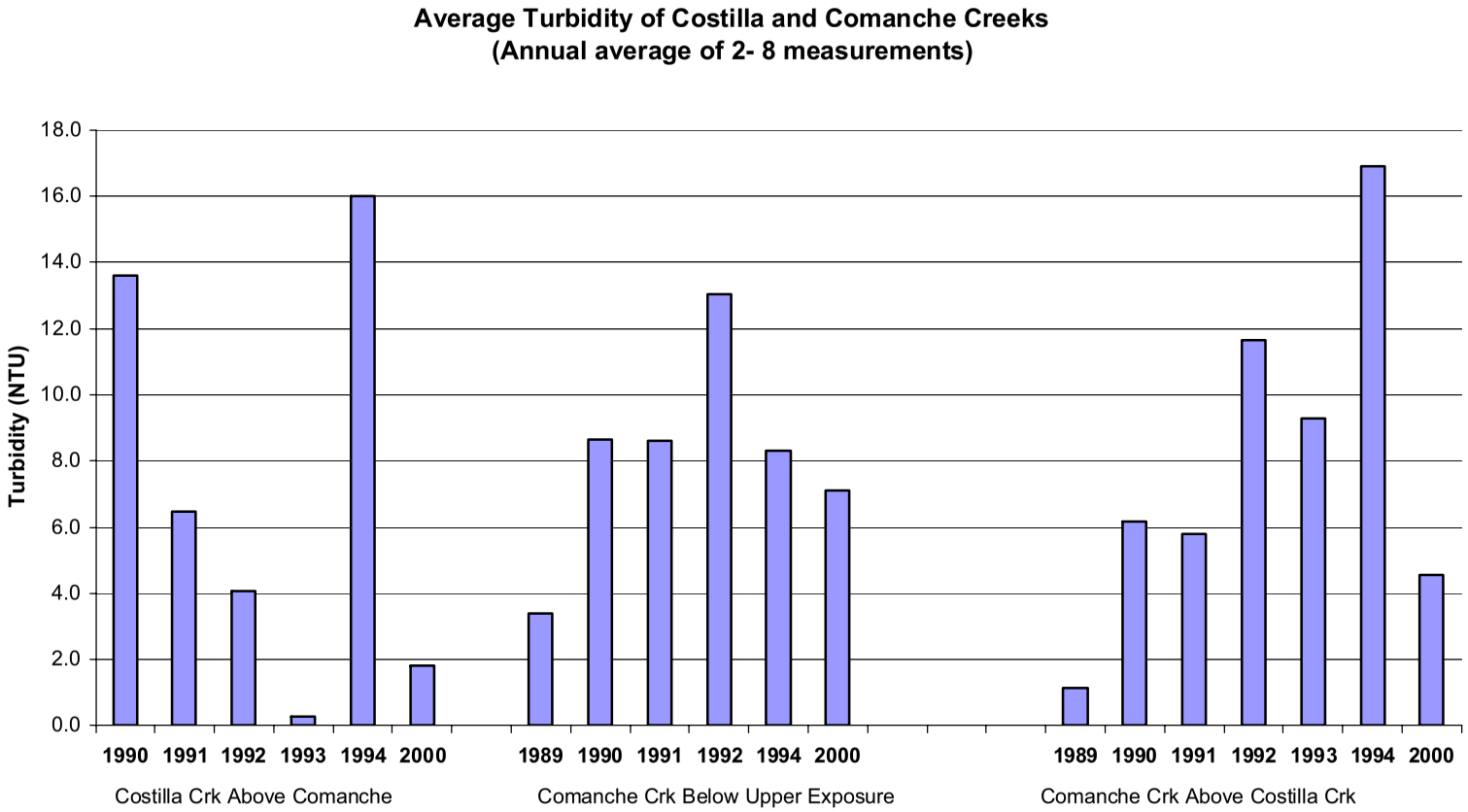

Figure 3-2. Average turbidity in grab samples collected in Costilla and Comanche Creeks.

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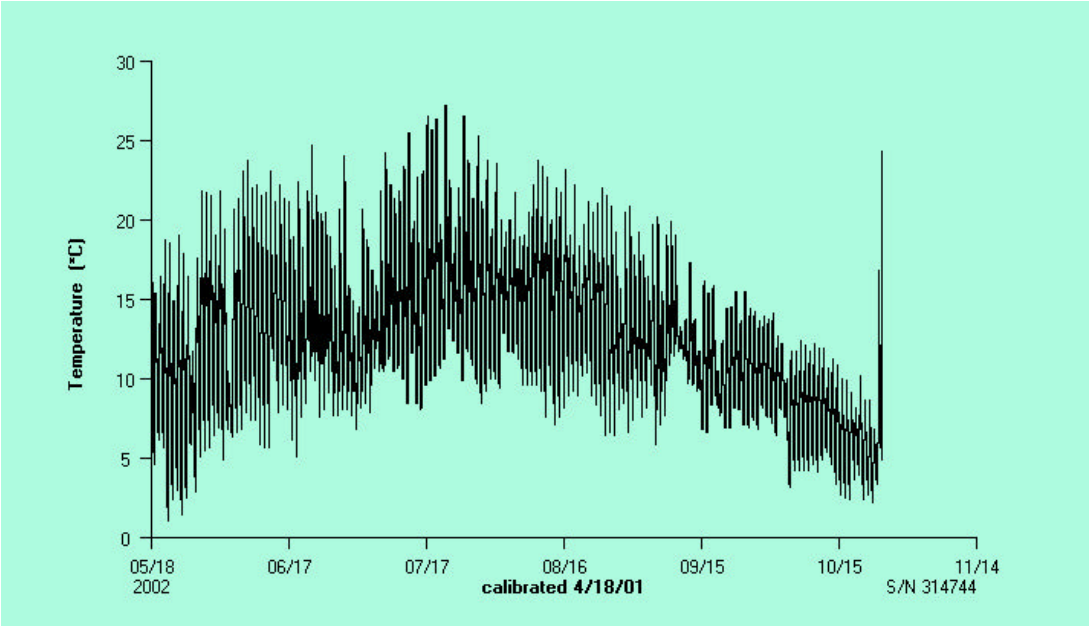
Figure 3-3. Comanche Creek Thermograph Summary

Comanche Creek (below upper exclosure) - 4.0 miles upstream along Comanche Creek from intersection of Forest Roads 1900 and 1950.

Deployed - 18 May – 23 Oct 2002
Maximum temperature = 27.09 ^{0}C

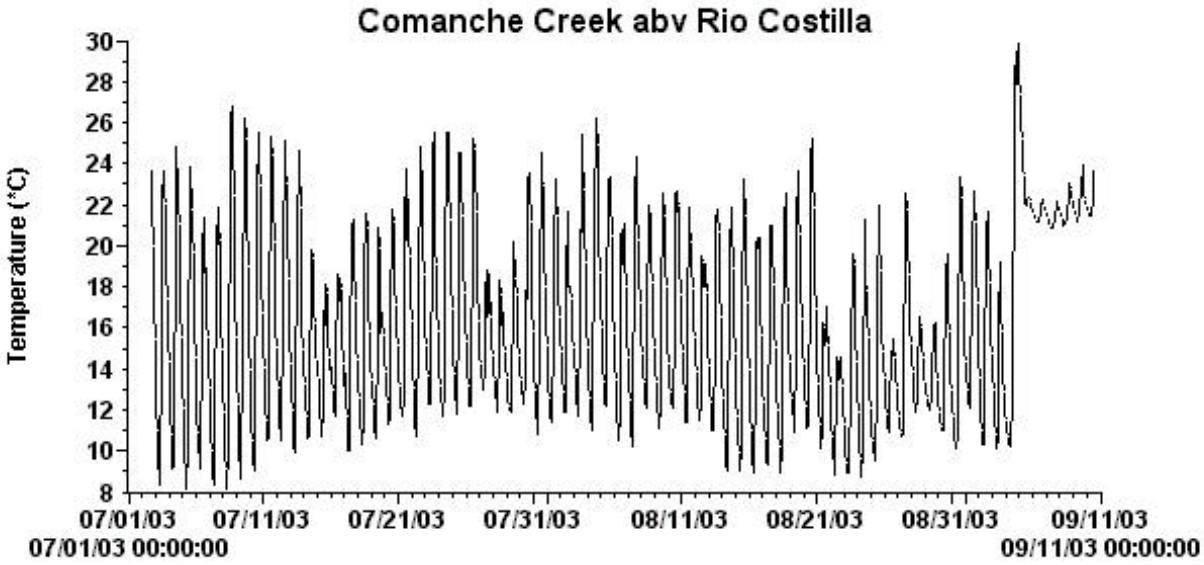
Data points >20 ^{0}C = 291
Data points >23 ^{0}C = 55



Comanche Creek (above confluence with Rio Costilla)
Immediately above the confluence of Comanche Creek and Rio Costilla.

Deployed - 2 Jul – 4 Sep 2003
Maximum Temperature = 26.89 ^{0}C

Data points >20 ^{0}C = 287
Data points >23 ^{0}C = 85



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Appendix 4. Testimonials of the unique value of the Valle Vidal

1. Philmont Scout Ranch

February 24, 2005

Philmont Scout Ranch
17 Deer Run Road
Cimarron,NM 87714

505-376-2281

Mark Andersen, Director of Program

Philmont Scout Ranch operates as a 136,000 acre High Adventure Base for the Boy Scouts of America. Since the property was donated to the Boy Scouts of America in 1938 by Waite Phillips more than 800,000 people from throughout the United States have enjoyed backcountry wilderness adventures.

In 2004, 22,029 participants visited the Ranch during the summer. The majority of the participants enjoyed 12-day backpacking treks. Approximately 350 people arrive each day and after reaching our peak 12 days latter 350 people depart each day. These participants are supported by a summer seasonal staff of 1016 people. In addition to the backcountry program, Philmont operates the national training facility for the Boy Scouts of America and welcomed 5,324 participants in 2004 who took part in training and activities as families.

Crews arrive at the Ranch and follow one of 35 specified itineraries. During the trek they have an opportunity to camp at staff camps and trail camps. Each of the 34 staff camp conducts a program that hikers can participate in. Half of the staff camp conduct programs in outdoor skills like mountain hiking, rock climbing, challenge course, 12-gauge shotgun shooting, land navigation, archery and search and rescue. The other half offer historical programs where we depict various historical settings across the Ranch that occurred during the exploration of the west. These programs include mountain men, gold miners of the 1860, homesteaders and cowboys. We also have an archeology camp that studies the life of the Anasazi and one camp that celebrates the life of the Jicarilla Apache. In the North Ponil and Middle Ponil areas on Philmont we have identified around 1000 historical sites some dating to 400 AD, in addition to the only T-Rex footprint in the world.

In 1988 we began hiking participants in the Valle Vidal. During the first summer 200 Scouts experienced the beauty of the land, practicing Leave No Trace skills, and navigating through the road less areas of the Valle. In 1993 we entered into our first Special Use Permit with the United States Forest Service and have renewed the agreement again in 1998 and 2004. Our permit allows up to 3000 hikers each summer to backpack through the Valle. Since 1988, 23J86 participants have enjoyed a portion of their trek in the Valle.

Last summer we camped 700 participants. We expect 2000 to hike through the area this

summer. We have slowly returned to the area after the 2002 Ponil Fire Complex that burned 93,000 acres, 28,000 acres on Philmont and 23,900 acres on the Forest Service.

Our current use includes:

- Our participants enjoy hiking in an area with minimal roads and improvements.
- We practice Leave No Trace principals. Each crew receives special instruction before they begin their journey across the Valle Vidal.
- We ask each hiker to spend at least three hours working on specific conservation projects. Since 1988 we have contributed over 69,558 hours of service to the Forest Service. In 1995 we were selected as one of four groups to receive the Chiefs Volunteers Program National Award - "Caring for the Land and Serving People." Over the years our projects have included fire rehabilitation efforts, prescribed bum preparation, stream bed and water shed improvements, animal exclosure on McCrystal Creek, Seally Creek erosion barriers, and construction of Gabion Baskets.
- Three Staff Camps operate during the summer:

  o Whiteman Vega - Mountain Biking, Tread Lightly, Conservation.
  o Ring Place - Astronomy, historical presentation the Valle Vidal and the Ring Family and their unique cabin, environmental awareness, weather.

  Scouts often get the chance to enjoy wildlife watching in the Valle. The chance to observe the magnificent Elk herd is especially exciting.
  o Seally Canyon - Search and Rescue and Conservation Awareness

  Allowing young people to experience the history of the Great Southwest has been a significant part of a Philmont experience. Sharing the early life of the Ring Family and the inhabitants of Ponil Park and Seally are important parts of our program. One of our full time employees' grandfather is buried in the Pioneer Cemetery at Seally.

  Another of our historical staff camps is the Rich Family homestead on the Middle Ponil bordering the Valle Vidal. We depict a living history program of Homesteading at the Rich Family Cabin. This past summer we hosted a family reunion of 33 decedents of the Rich Brothers. This was a first experience for most of them to enjoy the beauty of the area and appreciate the life of their early ancestors.

Trail camps include McCrystal Creek, Shuree Ponds, Middle Ponil/Greenwood Canyon, and Iris Park.

After the elk restrictions are lifted a few of our special treks make it to the top of Little Costilla to stand at 12,584 feet, "On Top of the World."

One of the highlights of our staff who spend their summer in the Valle Vidal is interacting with the public. We have an opportunity to share a great deal of history with those who camp at McCrystal Campground.
We also have been involved with numerous search and rescue activities for the

public (hikers, horse riders, and hunters) who find themselves in a difficult situation because of weather or inexperience.

We also provide the Forest Service with fire observers. This has been very important during the drought years. After the Ponil Fire we have been encouraged and supported by the Forest Service to develop a fire rehabilitation plan on the 28,000 acres which burned on Philmont. We have also been able to study and participate in the efforts that are taking place on the 23,900 acres of Forest lands that were impacted.

Our partnership for the past 16 years with the Forest Service has been a positive one. Our Scouts have been able to interact with Forest Service employees in many ways. It has allowed young people an opportunity to learn more about the management of the forest lands of America.

As you can tell, the Valle Vidal has become a very important part of the Philmont Scout Ranch backcountry operation. It provides Scouts from all fifty states and a number of foreign countries an opportunity to enjoy a wildland experience, one that can help to make a life changing experience. It has allowed us to serve up to an additional 3000 participants each year.

Recently, I received the following comments from a Scout from Elizabethtown, Pennsylvania. This Scout participated in one of our special treks through the Valle Vidal this past summer.

"For the first week we built trail at 10,000 feet near Baldy Mountain. The trail will connect Philmont Scout Ranch to the Valle Vidal. After completing a week of trail and friendship building, we were allowed to hike wherever we wanted as a reward for our service. We decide to leave the boundaries of Philmont and venture into the Valle. I was astonished. I love Philmont, I had been there once before in 2002, but I was awestruck by the beauty of the Valle."

"When I was at Philmont the first time, the Ponil Complex Fire was raging. This fire burned out much of the Valle region. It was amazing to venture, two years later, into the bumed area. The trees are still blackened with the soot from the fire. But even with the blackened trees, the scenery was breathtaking. One day of our trek we hiked to the top of Little Costilla. It is a 12,584 foot tall mountain in the Valle Region. Words don't exist that explain the beauty of the view. To the South is Philmont, to the North Colorado, to the West Wheeler Peak and to the East is the entire Valle."

"Hiking through the Valle had a huge impact on my life. Nowhere on earth have I felt closer to God and His creation. No words can express how beautiful this land is."