PISTOL RIVER WATERSHED ANALYSIS

ITERATION 1.0

September 15, 1998

I have read this analysis and find that it meets the Standards and Guidelines for watershed analysis required by the Northwest Forest Plan Record of Decision dated April 1994.

SIGNED_____DATE_____

District Ranger
Chetco Ranger District
Siskiyou National Forest

PISTOL RIVER WATERSHED ANALYSIS

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Introduction

The Pistol River Watershed Analysis, Version 1.0, was initiated to obtain and document information on the aquatic, terrestrial, and social resources of the watershed. The information gathered and analyzed will be used to guide future resource management. It will also be used to ensure that Aquatic Conservation Strategy objectives and other Standards and Guidelines contained in the Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl (ROD, 1994) will be met.

The watershed analysis was completed by an interdisciplinary team using the six step process outlined in *Ecosystem Analysis at the Watershed Scale (Version 2.2, August 1995).* The analysis is documented in sections: the Aquatic Ecosystem, the Terrestrial Ecosystem, and the Social Aspects of the Watershed.

Pistol River Watershed

The Pistol River is located in the Klamath Mountain Province in southwestern Oregon (see Vicinity Map). The Pistol River drains into the Pacific Ocean, with the mouth of the river located between Brookings and Gold Beach. The watershed has 67,172 acres, 52% of which is on the Chetco Ranger District of the Siskiyou National Forest. The remaining 48% is divided among the Bureau of Land Management, the State of Oregon, and private landowners (see Ownership Map).

Table 1: Land Ownership

Ownership	Acres	Percent of Watershed
USDA Forest Service	35,097	52
Private	28,869	43
USDI Bureau of Land Management	3,060	5
State of Oregon	147	0.2
Total	67,172	100

The Siskiyou National Forest land management direction is provided by the Siskiyou Land and Resource Management Plan (Forest Plan, 1989) as amended by the Record of Decision and Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl (ROD, 1994). Allocations for the National Forest System lands within the Pistol River watershed are listed in Table 2. The definitions and management strategy for these allocations can be found in the ROD and in the Forest Plan (see Management Area Map).

Table 2: Management Allocations

Allocation	Acres	Percent of NF Land
Botanical	473	1
Unique Interest	43	0.1
Backcountry Recreation	2,245	6
Late Successional Reserves	11,298	32
Special Wildlife Site	654	2
Riparian Reserves	4,122	12
Matrix	16,264	46
Total	35,097	100

AQUATIC ECOSYSTEM NARRATIVE

Geologic Characterization

The Pistol River is part of the Klamath Mountains geologic province and includes a mixture of igneous, metamorphic, and sedimentary formations (Irwin 1966, Dott 1971, Jones and Ferrero 1990, quoted in Russell 1994). Primary geologic units include Dothan and Colebrook formations (see Geology Map, from 1991 Geologic Map of Oregon). The Dothan formation dominates the basin and consists of mudstones, sandstones, shales, and undifferentiated volcanics from the Jurassic period. They are similar to the California Franciscan formation. Soils in mudstone, siltstone and shale units tend to be deep (> 1 m), silty and clayey, and poorly drained. Soils on sandstone tend to be sandy and well drained and of medium depth (0.5 to 1 m) on slopes and thin (0 to 0.5 m) on ridges. Dothan volcanics form outcrops or thin, rocky soils. The Colebrook formation, also Jurassic, consists of low-grade metasediments and metavolcanics, predominantly schist and phyllite with abundant quartz. Soils are generally thick on moderate hillslopes and thin in steeper inner gorge and stream-adjacent slopes. Colebrook soils are generally resistant to erosion on gentle slopes but are highly erodible on the steep inner gorges of stream channels. Cretaceous sediments have been mapped in the eastern part of the basin around Windy Valley and Windy Creek. Serpentinized peridotite dominates the upper slopes of the North Fork Pistol landscape although Colebrook schists make up the inner gorges.

What erosion processes are dominant within the watershed?

Natural Processes

Several major fault zones have been mapped in the Pistol River watershed and include north-south trending, high angle reverse, and low angle thrust faults. These faults form contact shear zones which subsequently act as groundwater conduits and form deep, sheared saturated soils. These areas are unstable when combined with steep slopes, and are an important source of sediment to Pistol River.

Mass movements in the watershed are concentrated in the inner gorges and tributary headwalls underlain by Colebrook schist and Dothan mudstone, siltstone, and sandstone units and in contact zones. Landsliding is most prevalent in these over-steepened areas due to saturation as well as groundwater outflow along faults and contact zones. According to Jones and Ferrero (1990), saturation by groundwater is a major cause of mass movement in all rock types, soils, and slopes within the watershed.

Human activities affecting erosion processes

Numerous studies have shown that road construction and timber harvest can increase sediment delivery to streams. A master's thesis (Russell, 1994) examined sediment production and delivery rates specifically in the Pistol River watershed. The estimated sediment production included all lands (private, State of Oregon, Bureau of Land Management, and National Forest) within the watershed for the period 1940-1991. The thesis found that roads within the watershed produce sediment at a rate 32 times that of surrounding undisturbed forest lands.

The thesis also found that timber harvest had increased sediment production rates by 2.8 times that of surrounding undisturbed forest lands. Typically, riparian buffers were not used in harvest areas on National Forest System lands until the mid 1980's. Within the Pistol River watershed, landslide sediment delivery is highest along slopes adjacent to streams (Jones and Ferrero, 1990), particularly when they have been harvested.

Information Needs Sites of specific management-related sediment sources.

Management Opportunities Stormproof or decommission roads that have a high potential for sediment delivery.

What are the dominant hydrologic characteristics and processes?

The Pistol River watershed receives an average annual precipitation ranging from 90 inches near the mouth to 130 inches near the headwaters at Snow Camp. Most of the watershed is within the rain-dominated zone, much of it is within the transient snow zone, and a small portion in the vicinity of Snow Camp (elevation 4221 feet) is within the snowpack zone. Winter storms bring high flows and the transient snow zone contributes to even higher peak flows when warm rains melt an existing snow pack. In sharp contrast to high winter flows, early autumn brings low flows at the end of a dry summer. Many of the upper slope streams do not have surface flow during this time. Small springs are scattered across the basin but do not provide enough surface flow during the dry season to be significant at the watershed scale. However, where they occur they provide significant local relief from the otherwise dry summer environment.

There is no streamflow gage on the Pistol River, but a staff gage can be seen on the abandoned bridge abutments in the lower channel. It is unknown whether or not there are records of stages or corresponding flows at this spot. Flood events on the Pistol River were reported in December 1861, February 1890, February 1927, December 1955, December 1964, December 1965, January 1971, (Floodplain Management Study, SCS, March 1982), and November 1996.

What are the basic morphological characteristics of stream channels and the general sediment transport and deposition processes?

Pistol River streams generally flow through narrow, steeply incised inner gorges. As a result, flood plain development and depositional areas in the active channel are limited to the lower South Fork and the mainstem below South Fork. Well-developed flood plains are only in the first 3.4 miles above the mouth.

Longitudinal profiles of the Pistol River and named tributaries, based on 7.5 minute series USGS topographic maps with 40 foot contours give broad scale information on deposition and transport reaches. See annotated profiles, Appendix A.

Timber harvest and roads can increase sediment production and peak flow, affecting bank and channel stability. The condition of the lower Pistol River will remain uncertain as continued timber harvest and road construction on private lands could delay the system's recovery from excessive sediment produced in past decades. Sediment production has been decreasing since it reached a peak between 1970 and 1986. The lower Pistol mainstem and South Fork received the majority of the sediment and have experienced the greatest effects to the aquatic system.

Sources of Large Wood to Channels

Large wood in streams is important for fish habitat and channel stability. Wood is delivered to streams two ways. Trees tall enough to reach a stream can fall into the channel, or trees growing in unstable areas directly uphill of a stream enter the channel when a landslide or debris flow is triggered along the unstable area.

The high levels of clearcut harvest in the overall Pistol River watershed have probably depleted future supplies of large wood to the mainstem.

Management Opportunities

Increase the restoration rate of the large wood supply within riparian areas on National Forest System lands within the watershed by planting conifers in understocked areas, thinning conifers in overstocked areas, and manual release.

What beneficial uses dependent on aquatic resources occur in the watershed? Which water quality parameters are critical to these uses?

Throughout the watershed, the primary beneficial use is the anadromous fishery. In the residential and agricultural areas of the lower watershed, water is used for domestic and irrigation purposes. There are also several popular swimming holes in the lower mainstem for summer recreation.

Water quality factors that affect all of these uses are temperature and turbidity.

Stream Temperature

Temperature is affected by streamside shade and channel morphology. It is believed that summer stream temperatures in the lower Pistol River have risen significantly, beginning in the 1950's. This is due to the amount of streamside harvest and road construction in the watershed which reduced streamside shade and increased sediment delivery. The increased amount of sediment filled pools and created broader, flatter channels in low gradient sections which heat more quickly. In recent years, stream shade and stream channels have been recovering in the upper Pistol mainstem, reducing stream temperature. Stream surveys in 1979 found only 29% stream shade. Comparison of the same area in a 1989 survey found the stream shade had recovered to 55%.

Harvest of conifers and hardwoods continues on private land, maintaining the warmer stream temperatures in downstream sections. Aquatic species dependent on cooler water are known to be decreasing in numbers, and stream temperature may be a factor in this decrease (ODFW, 1991). Maintaining cooler stream temperature in the tributaries feeding the downstream sections of the river is important.

Stream temperatures were monitored in a cooperative effort between the US Forest Service, ODFW, and OSU as part of the Pistol River Study 1991-1993. This data shows a range of average 7-day maximum temperatures from 62° to 75°F. Monitoring by USFS and ODFW began again in 1997.

Table 4: Average 7-day Maximum Stream Temperatures

Stream	Site Name	1997
Pistol River	above East Fork	66.6
North Fork Pistol	r.m.3.1	--
	bridge	69.0
East Fork Pistol	mouth	65.2

Turbidity

Turbidity is caused by the portion of sediment with small enough particles to be suspended in the water column, rather than transported along the streambed or carried short distances and deposited, as are the "coarse" cobbles and gravels and "fine" sands. Typically, streams in the Pistol River system are turbid during storms and clear quickly. Frequency and duration of turbidity may have increased following management activities that increased peak flows, erosion, or mass failures. Higher turbidity during storms has been anecdotally observed in major tributaries with recent high levels of harvest.

Management Opportunities

Increase the growth of shading vegetation within riparian areas on National Forest System lands within the watershed by planting conifers in understocked areas, thinning conifers in overstocked areas, and manual release.

What is the character of fish habitat in the watershed?

The mainstem of the Pistol River provides both spawning and rearing habitat for fall chinook and winter steelhead. The fall chinook migrate up the mainstem to the confluence with the East Fork. Fall chinook have also been seen in the first 0.5 mile of the East Fork. The winter steelhead migrate up the mainstem to river mile 17.5 where passage is blocked by a 15 foot waterfall. The first 4.0 miles of the East Fork provide spawning and rearing habitat for the winter steelhead, as well as the first 0.1 mile of Meadow Creek. Resident rainbow and cutthroat trout are also present in the streams listed above and several of their tributaries.

The mainstem of the Pistol River below the East Fork has historically provided high quality habitat for anadromous fish (oral histories on file at Chetco Ranger Station). However, extensive road building and logging from 1955 to present along the mainstem of the river and the major tributaries has led to a severe loss of pools and increase in water temperatures. Slopes of several tributaries and stretches of the mainstem are currently major sediment sources for fish habitat (Russell, 1994). Peak summer stream temperatures range from 70-75 degrees Fahrenheit, which is marginal for the survival of salmonids (ODFW, 1991).

On National Forest System lands, timber harvest and road building occurred in the upper mainstem and the North Fork Pistol drainages in the 1960's and 1970's. Stream surveys and aerial photos from the 1970's reveal localized heavy impacts including loss of shading vegetation and increased sediment delivery. The 1980's brought a decline in both rates and intensity of timber harvest, allowing these areas to recover. Recent stream surveys reveal high quality fish habitat. The streams are again shaded and have been flushed of excess sediment. Peak summer temperatures at the Forest Boundary are below 70 degrees.

What is the distribution of fish in the watershed?

The anadromous fish species the Pistol River supports are fall chinook salmon, winter steelhead and sea-run cutthroat trout. (See Map of Fish Distribution) Resident species present are rainbow and cutthroat trout. The fall chinook population is classified as depressed by Oregon Department of Fish and Wildlife (ODFW, 1972) and the American Fisheries Society (Nehlson, 1991). According to ODFW, the chinook run has declined about 70% since the late 1970's and has never rebounded. The winter steelhead run is just one component of the overall Klamath Mountains Province steelhead population which has been recently proposed for listing as threatened by the National Marine Fisheries Service (NMFS, 1995).

What are the vegetative types of riparian areas in the watershed?

About 12 percent of National Forest lands in the Pistol River watershed have been allocated to Riparian Reserves. These riparian areas can be grouped into four categories of vegetative characteristics: conifer forest, hardwood forest, meadow, and ultramafic riparian areas.

The most common category, conifer forest riparian, is generally located on more productive soils where availability of water is not growth limiting. Because tall conifers such as Douglas-fir, western hemlock and Port-Orford-cedar dominate these areas, more land use activities have taken place in this riparian type. Hardwoods are an important component of these multilayer, generally closed, canopies. Where riparians have not been disturbed by harvest activities, large wood in the form of limbs and boles is continuously delivered to the stream channel.

Hardwood-forested riparian stands tend to replace conifer-riparian stands where either water is limiting or fires have disturbed the riparian zone. These stands are dominated by tanoak trees, with madrone, myrtle, chinquapin, knobcone and sugar pine often present. Scattered Douglas-fir will often grow directly out of the stream channel where there is more water. These stands are generally closed canopy, single-storied structure with low ground cover that do not have the insulating qualities of conifer forest.

Meadow riparian areas occur on dry sites with high fire frequency and wetland soils. Most meadows outside National Forest lands have been homesteaded and grazing of cattle still occurs. A reduction in fire frequency over the past century has increased the forest encroachment on dry site meadows.

The ultramafic riparian areas are primarily located in the Windy Creek and North Fork Pistol drainages. Although they have fewer trees than the conifer and hardwood forest riparian areas, they have a larger component of Port-Orford-cedar. Port-Orford-cedar provides long term structure to the stream channel due to its slow rate of decomposition. The open canopy provides less shade, so stream temperatures are normally warmer than in conifer and hardwood forest riparian areas. Because water provides a natural vector for *Phytophthora lateralis* to infect Port-Orford-cedar, mortality rates in riparian areas are greater than in upland areas.

Management Opportunities

Accelerate the development of large wood and maintain forest health through planting of desired species, release and precommercial thinning of young managed stands. Slow the spread of *Phytophthora lateralis* through road repair, seasonal closures and decommissioning, and trail design and maintenance.

TERRESTRIAL ECOSYSTEM NARRATIVE

Vegetative Characterization

The Pistol River watershed extends from the Pacific Ocean approximately 15 air miles east and to an elevation of 4221 feet. Its coastal exposure and inland areas of ultramafic soils provide growing sites for a variety of vegetation types.

Ultramafic soils found in the North Fork Pistol and Windy Creek drainages support a wide variety of conifers, including Jeffrey pine, western white pine, knobcone pine and scattered sugar pine on drier upper slopes, and Port-Orford-cedar and incense cedar in wet areas. Brewer spruce have been found in the vicinity of Snow Camp Mountain and a stand of lodgepole pine can be found at Flycatcher spring. California pitcher plant (*Darlingtonia californica*) is found in many locations in association with ultramafic plant communities.

The condition of the seral stages within the watershed has been influenced considerably by past and present management activities on public and private lands. On National Forest lands late-seral habitat accounts for roughly 15 percent of the watershed. The acreage allocated to Late-Successional Reserve is 11,298, about 17 percent of the watershed. About 40 percent of the watershed is comprised of Douglas-fir and mixed hardwoods in an early to mid seral stage. Harvest unit and hardwood conversion regeneration efforts throughout the watershed have been successful and managed stands are thrifty. Hardwood competition with conifers and overstocking due to natural reseeding continue to cause the need to release and precommercial thinning in young managed stands.

There are more than 1700 acres of meadow in the Pistol River Watershed. The most notable meadows are: Windy Valley, Snow Camp meadow, Fairview meadow, Crockett's Prairie and Gardner Ranch. Snow Camp Botanical Area is located in the Pistol River and Lawson Creek watersheds. It includes the top of Snowcamp Mountain, Snow Camp Meadow, and Fairview Meadow in the Pistol watershed. The flora is quite varied and the area is home to at least six sensitive plant species. Wet sites are inhabited by species such as *Carex scabriuscula* and *Lilium vollmeri*; and dry sites by species such as *Lilium bolanderi* and *Cypripedium californicum.*

Information Needs

Public and private lands outside the National Forest boundary should be inventoried to determine the current vegetation composition and condition.

What are the special and unique habitats in the watershed and how are they changing?

The Pistol River watershed provides wide variety of important wildlife habitats such as old-growth, meadow, rock outcrop, pond, and riparian.

The late-successional habitat in the watershed provides important nesting habitat for the threatened northern spotted owl. The Southwest Oregon Late-Successional Reserve Assessment determined that 29 percent of the North Chetco LSR is in a late-successional condition and 5 percent is interior LSR habitat. Roughly 27 percent of the watershed is currently suitable owl habitat and there are from 4 to 6 occupied sites. Due to the extensive harvest activities on private land in the lower Pistol basin, old-growth stands

on National Forest lands are the first habitat encountered by nesting marbled murrelets. Within 6 air miles of the Pacific ocean the late-successional habitat is the location for at least 12 known occupied marbled murrelet sites.

Pioneer successional habitat (grass/forb/low shrub) in the watershed is found in recent (less than 15 years old) clearcut areas, meadows, open woodland areas and brushfield areas. About 22 percent (7,800 acres) of the watershed on National Forest lands is currently in this habitat. The majority of the existing clearcut areas that are functioning as pioneer habitat will grow out of this condition within the next 15 years.

Within National Forest land there are about 590 acres of meadow habitat. Meadows are important areas for native grass species and permanent forage for wildlife. Meadows provide rearing habitat for Roosevelt elk, black-tail deer, grouse, quail and neotropical birds. Nearly all the meadows in the watershed have been grazed by cattle. Cattle still graze meadows on private land in the lower basin. The majority of sensitive plants within the watershed are in areas with serpentine soils. These soils are inhabited by a large number of fruit bearing plants such as coffeeberry, red huckleberry and indian plum, important to wildlife for forage.

Open meadow areas are being reduced in size by tree encroachment. Bogs, springs, ponds, and lakes are being encroached at a slower rate; some ponds and lakes are filling in with silt and vegetation. Open serpentine areas are being encroached by conifers and hardwoods.

Information Needs

Identify areas of talus habitat for Del Norte salamander that need protection. Identify and buffer large rock outcrops that may be peregrine falcon nest habitat.

Management Opportunities

Maintain and restore open meadows, open serpentine areas, and pond sites. Treatment options include girdling or cutting and removing encroaching trees in bogs, springs, and meadows; cutting encroaching trees in serpentine areas; burning meadows and open serpentine areas; cleaning out pond sites by removing silt and overgrown vegetation; and conducting protocol surveys for talus habitat in all proposed project areas.

Table 5: Priority Habitat Treatment Areas

Habitat Type	Location
Meadows	Snow Camp Meadow, Windy Valley Meadow, Derringer Meadows, Crockett Prairie, Meadow Creek Meadow, Sunrise Creek Meadows, Hazel Camp Meadows, North Fork Pistol Meadows
Open serpentine areas	Snow Camp Mountain and Botanical Area, North Fork Pistol, Upper East Fork Pistol
Bogs and springs	Flycatcher Springs, Snow Camp Mountain, North Fork, Upper East Fork
Ponds and lakes	Panther Lake, Snow Camp Meadow Area, Elko Pond, and unnamed ponds near Forest Roads 1407210, 1503030, 1503037, 3680360, and 3680361
Large rock outcrops	Snow Camp Mountain, Windy Valley, Upper East Fork, Upper Pistol, Forth Fork Pistol, Stack Yards, Hog Mountain
Talus habitat	Throughout all Matrix Land Allocation

Where are snags and large down wood lacking in the watershed?

Large hardwoods and conifers, snags, and large down wood are at reduced levels in managed stands throughout the watershed on federally owned as well as privately owned land. Agricultural and residential areas that have been cleared also have reduced levels of these components.

Management Opportunities

Treat stands to retain and develop large trees, down wood, and snags throughout the watershed. Develop snags in areas adjacent to managed stands lacking snag and large woody material habitat. Recruit snags and large down wood in natural stands lacking this habitat component. Priority locations are throughout the watershed, especially in the lower Pistol, South Fork Pistol, Upper Pistol, and areas adjacent to privately owned land.

Treatments could include:

- Creating snags and down wood in areas adjacent to managed stands in the short term, and within managed stands in the long term, by selecting trees with larger or faster growth, or defect.
- Thinning in managed stands to grow larger trees for snag recruitment.
- Identifying green tree retention areas which provide protection for existing snags.

How is road density affecting habitat capability for deer and elk?

Road density in the Upper Pistol portion of the watershed is 4.24 miles per square mile. Road density in the Meadow Creek portion of the watershed is 2.80 miles per square mile. The East Fork subwatershed is mostly near or below 2.0 miles per square mile. Other subwatersheds contain road densities greater than the desired 2.0 miles per square mile.

Management Opportunities

Maintain or reduce road density to 2.0 miles per square mile or below to reduce harassment or disturbance to elk by vehicular traffic. This could be accomplished by closing existing and newly constructed roads to vehicle traffic. Priority locations are Upper Pistol, Meadow Creek, North and South Fork Pistol subwatersheds.

What proposed, endangered, threatened or sensitive (PETS) species, both flora and fauna, are present?

Several species of sensitive wildlife are present throughout the watershed. PETS plant species are limited in the watershed mainly to Botanical Areas and serpentine habitat, and isolated sites. Spotted owls have been recorded for eight know sites. Murrelets occupy 12 known stands and have been detected within the watershed at other locations. Del Norte salamander sites (and habitat) are common throughout the watershed. Red-legged frogs and pond turtles have been documented. Plecotus (big-eared bats) are suspected. Habitat for peregrine falcon is present; none have been documented. Kingsnakes have been documented on the 3680 road and may occur elsewhere in the watershed. Other PETS wildlife species are not expected to occur in the watershed. The East Fork and Meadow Creek portions of the watershed are a Late-Successional Reserve for northern spotted owl and late-successional related species.

The East Fork Pistol and areas in the North Fork Pistol are important areas of habitat for both spotted owl and marbled murrelet due to the lack of habitat for these two species on adjacent private lands, and close proximity to the ocean (murrelets).

Management Opportunities

Maintain or increase populations of sensitive plant and animal species within the watershed. Increase habitat capability for some species (i.e. spotted owl) within the late successional reserve by developing potential habitat into suitable habitat. Maintain known sensitive plant sites and Del Norte salamander sites. Avoid disturbance to sensitive species sites and individuals. Priority locations are known sensitive species sites in the watershed, and potential habitat areas for spotted owls, marbled murrelets, Del Norte salamanders, and peregrine falcon.

What stands need treatment for forest health and late-successional habitat?

Some stands, both managed and natural, are overstocked. Competition from hardwoods and conifers is causing slower development of younger stands. Older forest and interior forest habitat is fragmented into small patch sizes. Some older forest habitat is not functioning as interior forest habitat because of small patch size and edge effect.

Management Opportunities

Accelerate growth and development of early and mid seral stands into late seral stands. Increase patch sizes of older forest and interior forest habitat by developing adjacent early and mid seral stands into late seral stands. This could be accomplished by thinning and manual release of younger stands, and prescribed underburning in areas adjacent to older stands to reduce competition and fuels. Priority locations are:

- Areas in close proximity to older forest and interior forest habitat patches in the North Fork Pistol and Sunrise Creek drainages
- Managed and overstocked natural stands
- Late successional reserve in the East Fork and Meadow Creek portions of the watershed.

Are habitat connections between watersheds and late-successional reserves being maintained?

Habitat connection corridors have been identified for some of the subwatersheds (Upper Pistol, North Fork Pistol, Sunrise Creek, Meadow Creek, East Fork Pistol). Connection corridors are still needed for the remaining subwatersheds and with private and BLM lands. Both current and future proposed connections need identification, development, and maintenance.

Information Needs

Identify and establish current connections using suitable habitat types. Identify and establish future proposed connections using potential and suitable habitat types. Identify areas for improvement of these connections.

Management Opportunities

Establish a network of habitat connection corridors, both current and future, between all subwatersheds and land ownerships, by developing current habitat conditions into suitable habitat connections containing mid to late seral vegetation. Priority areas for connections are:

- Between private and federal lands
- Between North Fork, Sunrise, South Fork and Lower Pistol subwatersheds and their adjacent subwatersheds
- Between the North Chetco LSR and the North Coast LSR.

How are non-native species affecting the watershed?

Noxious Weeds

Noxious weed species are not abundant in the watershed. Gorse plants once found in the watershed have been eradicated and no new plants have been seen for several years. Tansy ragwort, pampas grass, Scotch broom, French broom, and thistles are found along mainline roads. Some sites are spreading along spur roads. Meadows have a higher susceptibility to some weeds.

Management Opportunities

Reduce the spread of noxious weeds by cutting, pulling, or burning plants along roads; closing spur roads not currently needed for management; and cleaning heavy equipment before entering the Forest.

Port-Orford-cedar Root Disease

The Pistol River watershed, along with the adjacent Collier Creek, Lawson Creek, Hunter Creek and Chetco River watersheds, contains Port-Orford-Cedar stands that are infected with *Phytophthora lateralis*. Sites infected are; the East Fork Pistol and Cedar Creek, beginning in a small tributary off road 1407; the North Fork Pistol and many of it tributaries that originate near road 1703 and its spurs; the mainstem of the Pistol River below the National Forest Boundary; and two isolated sites near roads 3680.340 and 3680.360 near Snow Camp Meadow. In addition to seasonal and permanent road closures within the watershed, portions of roads 1376 and 3680 have been sanitized to reduce the risk of further infection.

Management Opportunities

Reduce the risk of spread, and maintain or restore healthy Port-Orford-cedar in riparian reserves. Priority locations for protection are Windy Valley, Snow Camp Mountain and Meadow, Road 1376, and the upper mainstem. Treatment options include:

- Cut Port-Orford-cedar from edges of roads.
- Close roads not in current use.
- Clean heavy equipment before entering these areas.
- Restrict road use to dry season.
- Use uninfested water for firefighting and other uses.

- Place surface rock on segments of infested roadways.
- Plant and release Port-Orford-cedar on lower risk riparian microsites.

White Pine Blister Rust

Blister rust, a non-native disease affecting five-needle pines, was introduced into North America in 1911. Locally it affects western white pine and sugar pine. On Snow Camp Mountain humidity levels favorable to the disease have caused heavy white pine mortality. The limited, scattered sugar pine in the watershed is being killed by competition, blister rust, and mountain pine beetle.

Management Opportunities

Reduce the rate of spread of the disease, and maintain healthy stand components of five-needle pines by cutting dense hardwoods and conifers around sugar pine and white pine, underburning to reduce the risk of fire damage from dense fuels, and planting resistant stock. Priority locations are Snow Camp Mountain and scattered sugar pine sites.

SOCIAL ASPECTS NARRATIVE

What were the prehistoric uses of the watershed?

Known human uses of the Pistol River watershed began with Chetleshin band of the Tututni. Generally, Tututni bands lived in large, permanent winter villages established along coastal areas and rivers. Seasonally, inhabitants would leave the lowland villages for the upland areas to procure a variety of plant foods, other plant products and material for the production of stone tools. Big game hunting, possibly including drives using fire and pit traps, was also an upland occupation. Seasonal upland camps have been found in the watershed. Archeological evaluation has determined that upland sites were used approximately 4000 to 2000 years before present.

What were the historic uses of the watershed?

The first euroamerican settlers were miners who came to the area in the 1850's. Following or accompanying the miners were early settlers, farming in the flat lands along the rivers and major creeks and grazing cattle and sheep in the surrounding hills. Primary settlement was near the mouth of Pistol River, just as the Tututni had settled previously. Two meadow complexes have been used historically and currently for grazing. These areas are in private ownership and called Gardner Ranch and Miller Ranch (also known as Crockett's Meadow). Some of the earliest maps (1919) show Gardner and Miller in the Pistol watershed. The Pistol River Cattle Allotment has 34 cow/calf pairs and has been under permit since 1984.

Currently the flat lands near the mouth of the Pistol River are occupied by residences and ranches. The middle portion of the watershed is primarily owned by private timber companies. The upper portion of the watershed is primarily National Forest ownership. Timber commodity production has been an important human use of the middle and upper portions of the watershed since World War II.

What are the major recreational uses and where do they occur in the watershed?

The primary recreational activities which occur at this time are hunting and dispersed camping, fishing, sight-seeing, firewood gathering, and hiking , with swimming along the lower mainstem. The level of recreational use is not known.

Which roads are needed for future access in the watershed and which roads need treatment to protect the resources of the watershed?

Roads under Forest Service jurisdiction are listed in the Appendix. An interdisciplinary team categorized these roads according to the level of access they provide. Primary and Secondary roads are needed for future access in the watershed. Candidate roads do not provide access needed for administration or management of the forest, and may be eligible for decommissioning if an access need does not surface during public scoping.

Roads and stream crossings have not been inventoried to determine potential resource risks.

No data are available on the year the roads were built. Some private roads could have been built for homesteads in 1900. Public roads were built between 1950 and 1975.

Table 6: Pistol River Watershed Road Summary (FS Jurisdiction)

Number of Roads	Total Miles	Closed Miles	Miles to be Closed	Total Closed Miles
89	111.65	1.68	9.60	11.28 (10%)

Information Needs

Identify roads that are high priority for stormproofing or decommissioning.

Management Opportunities

One watershed restoraton opportunity identified for aquatic resources is stormproofing Road1703101.

References

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Pistol River Watershed Road List

Road No.	Segment	Length	Maintenance Level	Classification
1600070		2.43 *	2	S
1703000	from Forest boundary to 1503	6.00 *	2	S
100	from pvt to 1703	2.32 *	2	S
108		0.83 *	2	S
101		1.62 *	2	S
102		0.26 *	2	C
103		0.13 *	2	C
110		1.61 *	2	S
114		0.80 *	2	S
115		0.08 *	2	C
spur-1		0.20 *	2	C
120		0.76 *	2	S
122		0.12 *	2	C
150		2.00 *	2	S
156		1.09 *	2	S
158		0.16 *	2	C
159		0.11 *	2	C
190		1.73 *	2	S
1601010		1.12 *	2	S
1503030		8.03 *	2	S
030		1.35 *	1	C
031		0.10 *	2	C
032		2.81 *	2	S
spur-2		0.20 *	2	C
033		0.36 *	2	C
035		1.93 *	2	S
036		0.34 *	2	S
037		0.28 *	2	C
038		0.41 *	2	S
039		0.33 *	1	C
931		0.19 *	2	S
1503050		6.61 *	2	S
052		1.48 *	2	S
525		0.20 *	2	C
053		1.12 *	2	C
055		0.46 *	2	C
056		0.14 *	2	C
057		1.52 *	2	S
058		1.00 *	2	C
059		0.20 *	2	S
1503000	from 070 to 3680	1.00 *	3	P
070		1.65 *	2	S
072		0.50 *	2	C
073		0.11 *	2	S
3680300		0.55 *	2	S=0.3
				C=0.25
310		4.74 *	2	S=4.45
				C=0.29
311		0.58 *	2	S
312		0.84 *	2	S
313		0.62 *	2	S
314		0.83 *	2	S
316		1.70 *	2	S

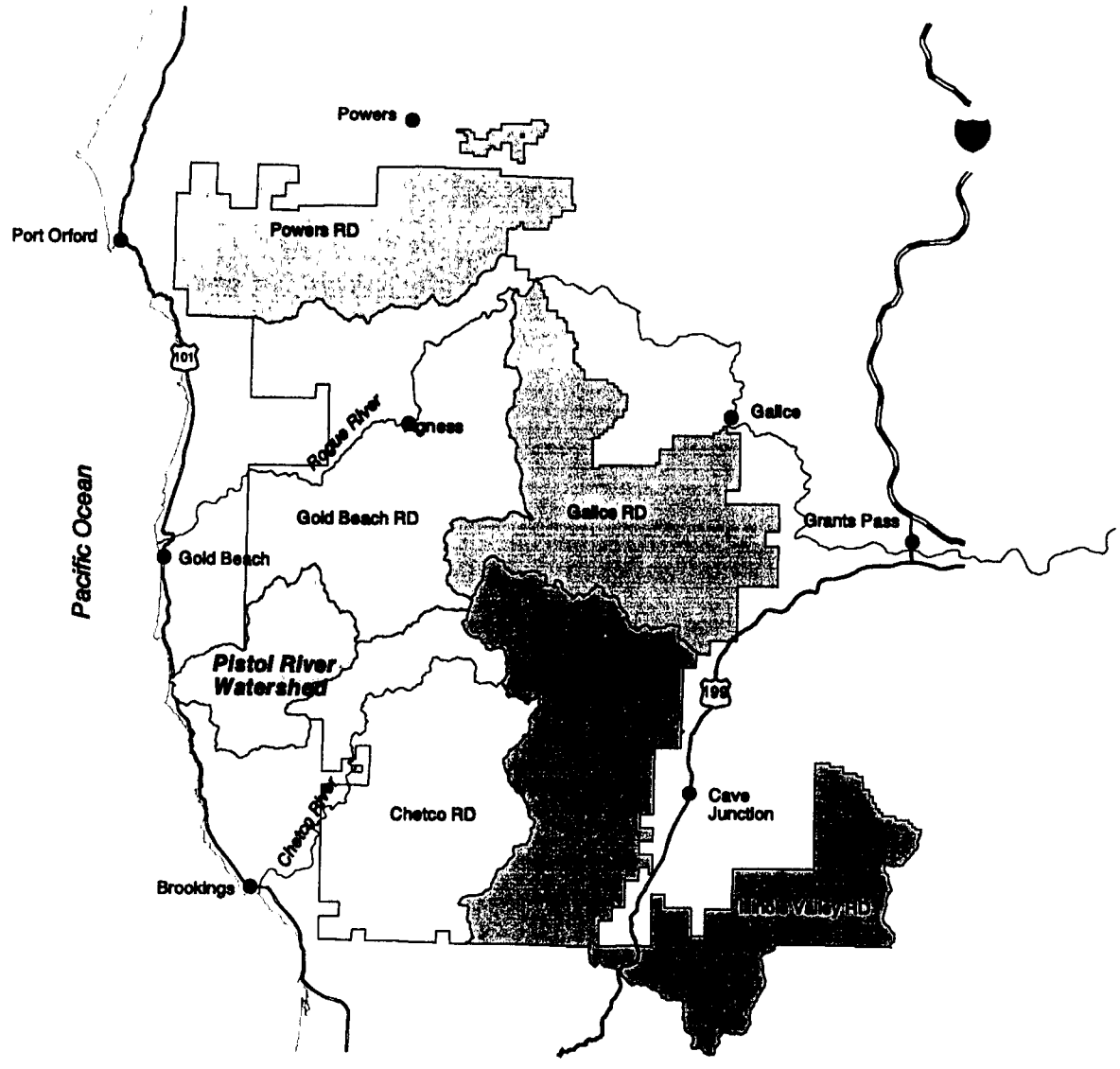
317		0.13 *	2	S
934		0.19 *	2	C
938		0.20 *	2	C
318		1.10 *	2	S
319		0.15 *	2	C
3680360		8.15	2	S
361		0.11	2	S
975		0.20	2	C
362		4.31	2	S
363		0.35	2	C
364		0.27	2	C
365		0.30	2	C
366		0.41	2	C
367		0.20	2	C
spur-3		0.20	2	C
368		0.54	2	S
964		0.82	2	S
369		1.96	2	S
966		0.47	2	S
967		0.05	2	S
1376000	from 3680 to sec 32	1.00	2	P
		1.00	3	P
590		0.41	2	S
1407000	from 1376 to 180	5.00 *	3	P
290		0.30	2	C
270		0.49	2	C
230		3.90	2	S
237		0.63	2	S
210		2.80 *	2	S
spur-4		0.20 *	2	C
spur-5		0.20 *	2	C
211		1.20 *	2	S
212		0.43 *	2	S
200		0.18 *	2	C
1407130	from sec 34/35 to end	6.00 *	2	S
133		0.62 *	2	S
136		1.36 *	2	S
138		0.27 *	2	S

* Road accesses Matrix

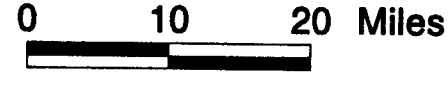
P=Primary Road, Maintenance Level 3,4,5. OPEN
S=Secondary Road, Maintenance Level 2A,2E. OPEN
C=Candidate Road, Maintenance Level 2D (to be closed), Maintenance Level 1 (closed)

Maintenance levels 1, 3, 4, and 5 roads are probably maintained to standard; maintenance level 2 roads are probably not. Transportation Network Analysis was conducted from 11-93 to 5-94.

PISTOL RIVER WATERSHED

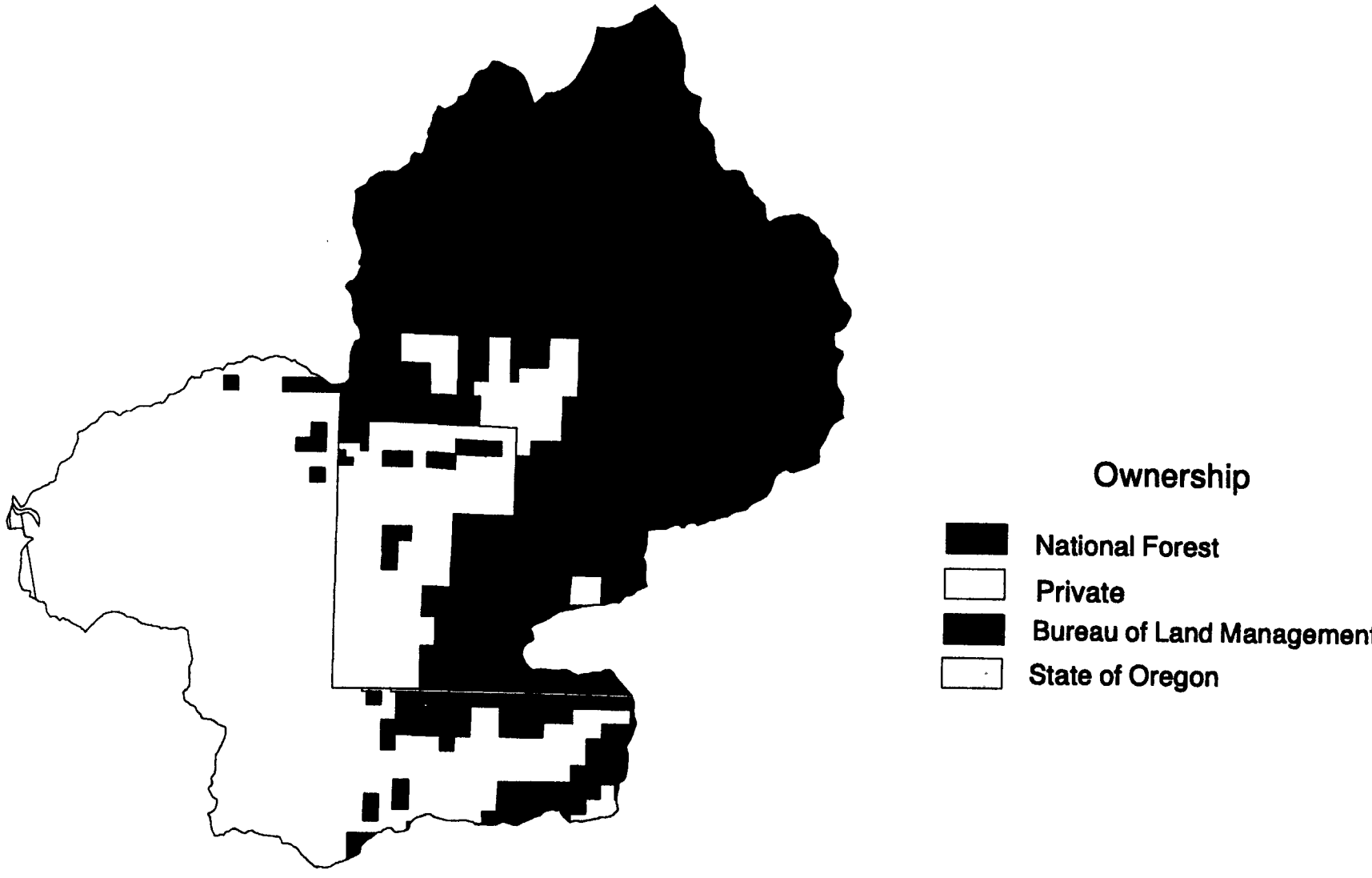


Vicinity Map



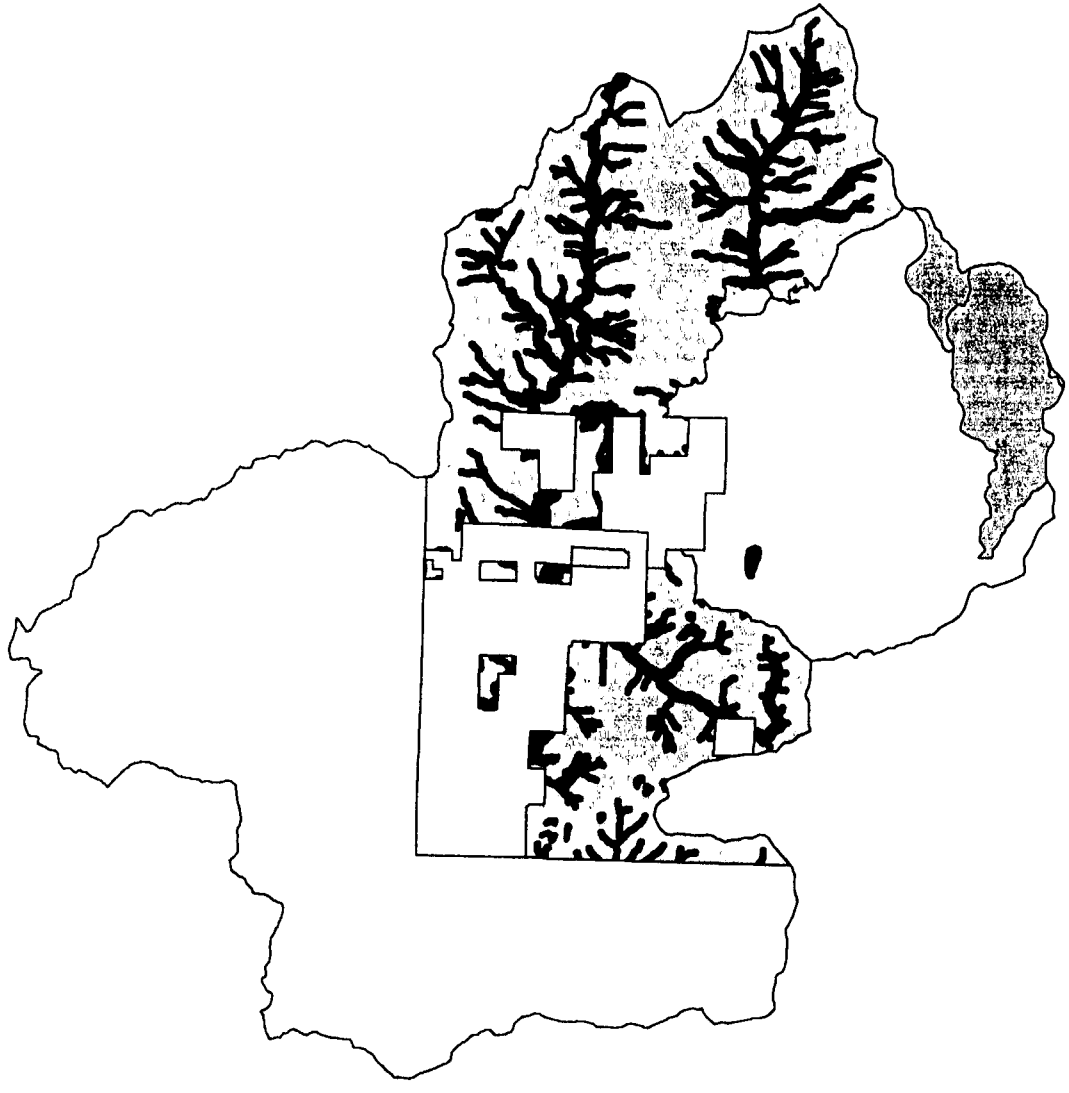
8/5/98 CR

PISTOL RIVER WATERSHED



8/5/98 CR

PISTOL RIVER WATERSHED

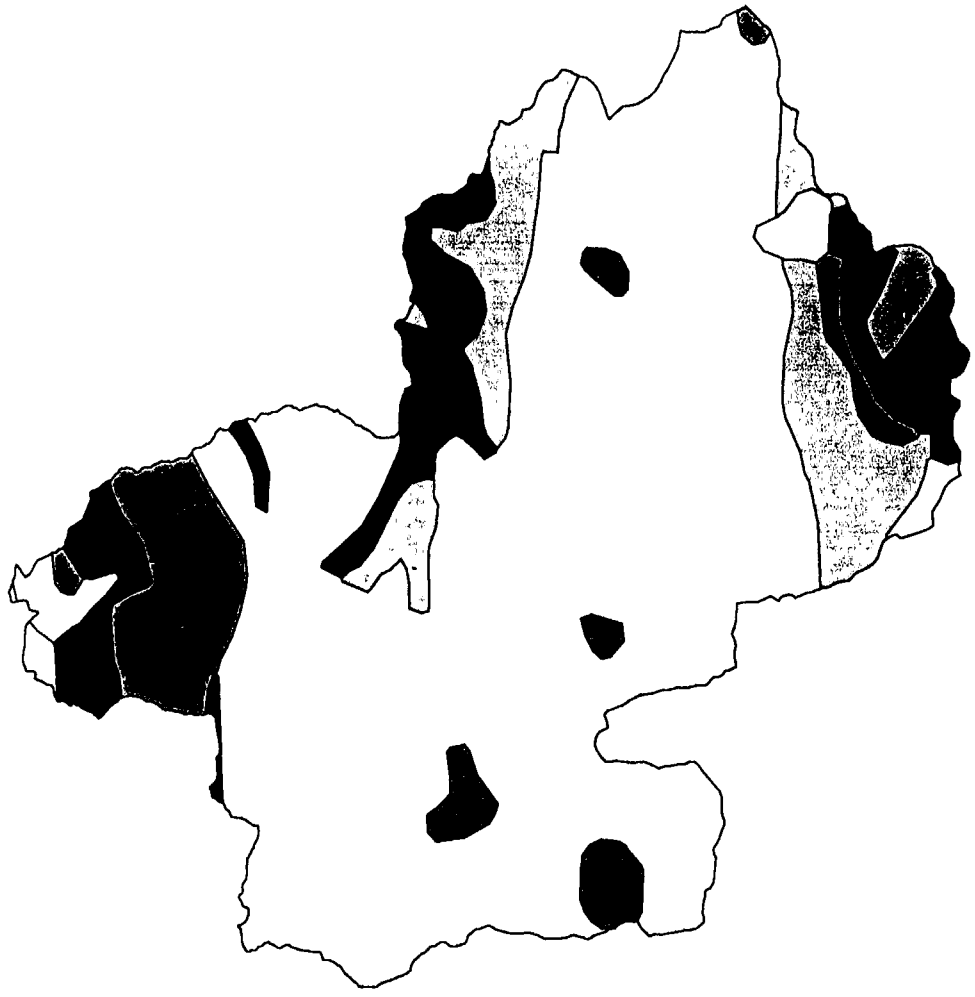


Management Area

- Botanical
- Unique Interest
- Backcountry Recreation
- Late Successional Reserve
- Special Wildlife Site
- Riparian Reserve
- Matrix
- not National Forest

8/5/98 CR

PISTOL RIVER WATERSHED

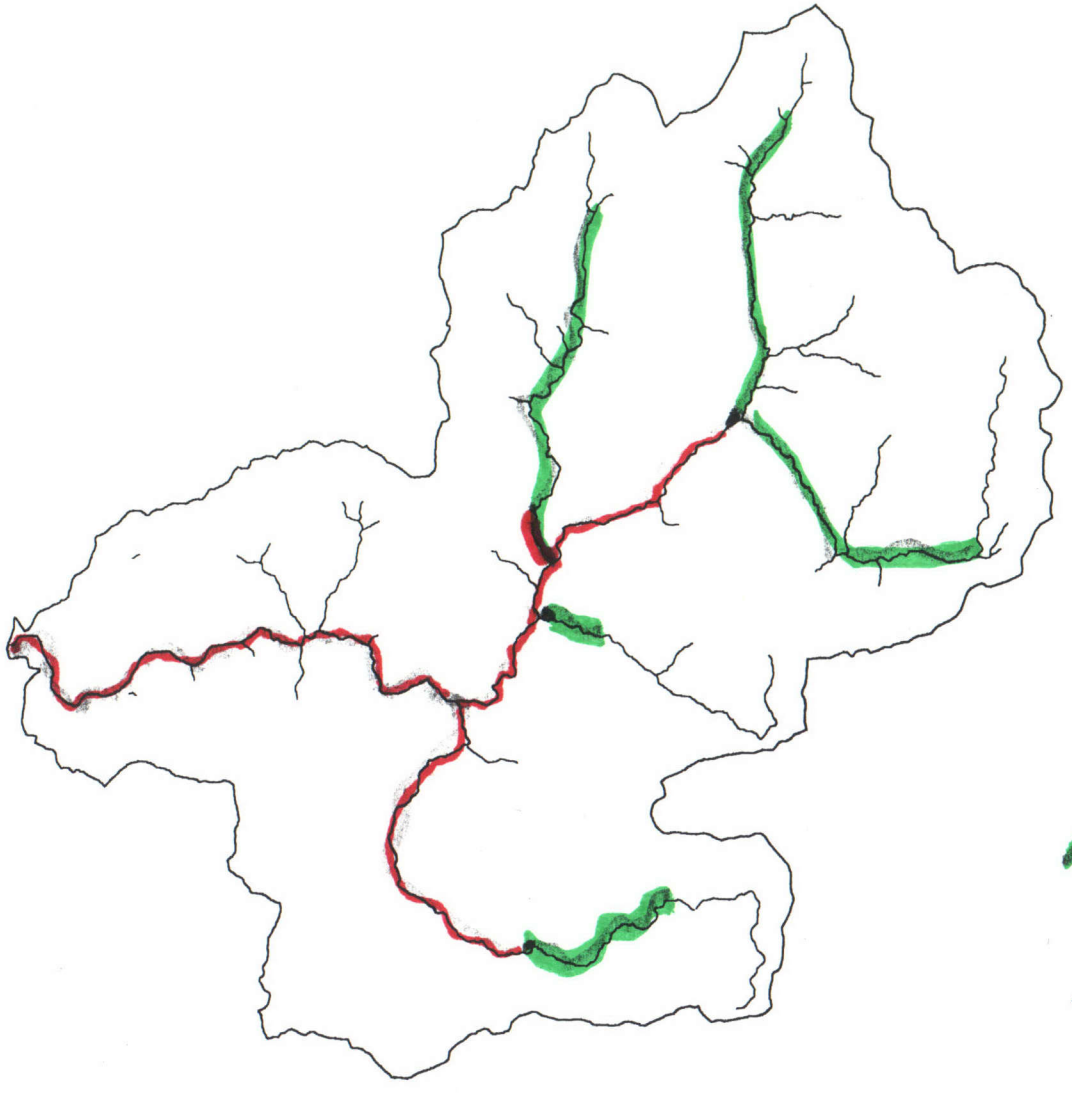


Geology

- intrusive igneous
- Otter Point sediments
- ultramafics
- Dothan sedimentary
- Dothan volcanics
- Myrtle sedimentary
- Cretaceous sedimentary
- Quaternary alluvium
- dune sand
- landslide deposits
- Colebrooke schist

8/5/98 CR

PISTOL RIVER WATERSHED



Fish Distribution

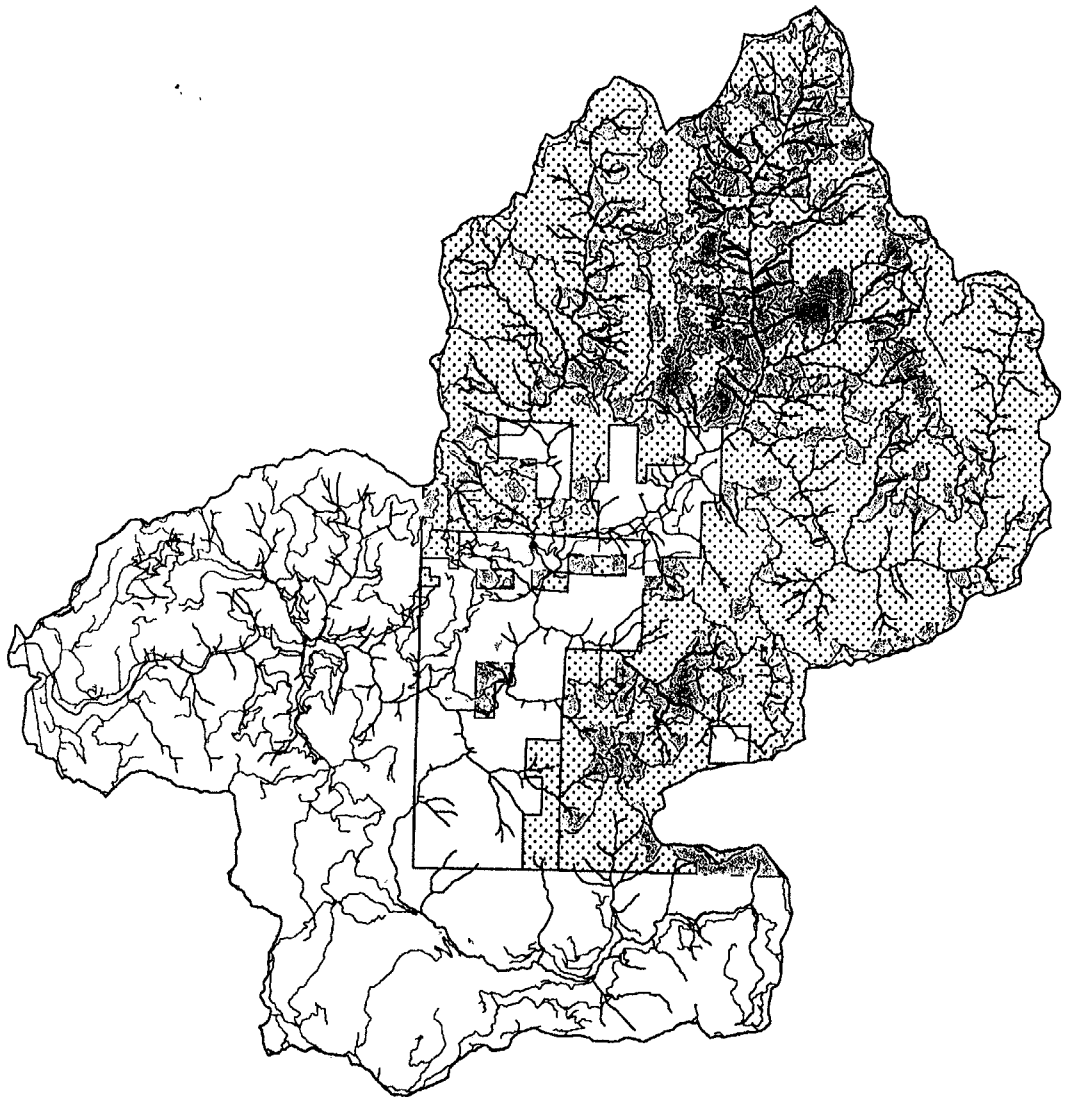
Fall Chinook, Searun cutthroat, Winter steelhead, and Residents

Winter steelhead, Searun cutthroat, and Residents

Resident cutthroat and rainbow

8/5/98 CR

PISTOL RIVER WATERSHED



Streams
(streams in SW portion of watershed not shown)

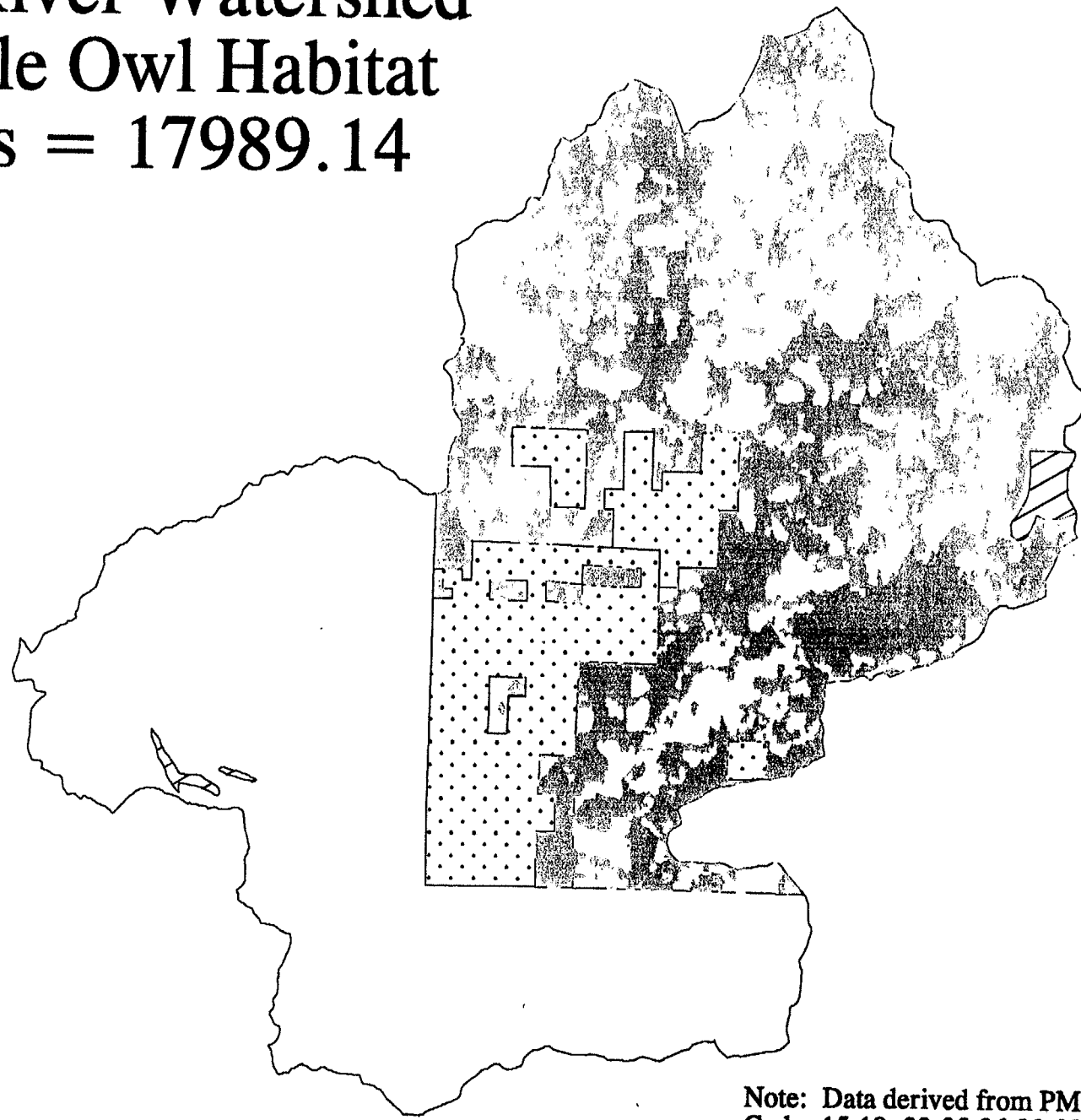
Roads

Managed Stands
on National Forest lands

National Forest lands

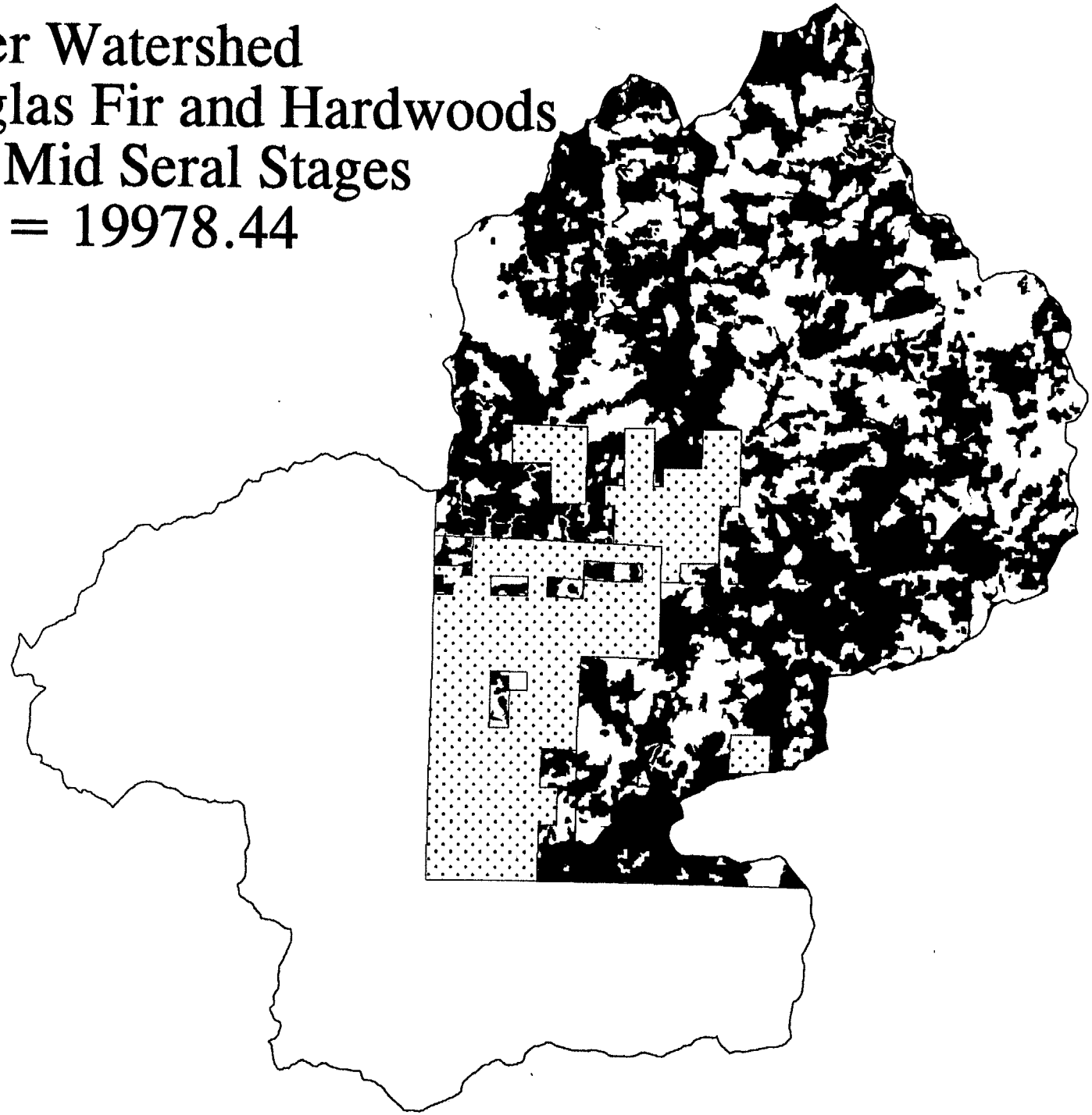
8/5/98 CR

Pistol River Watershed
Suitable Owl Habitat
Acres = 17989.14

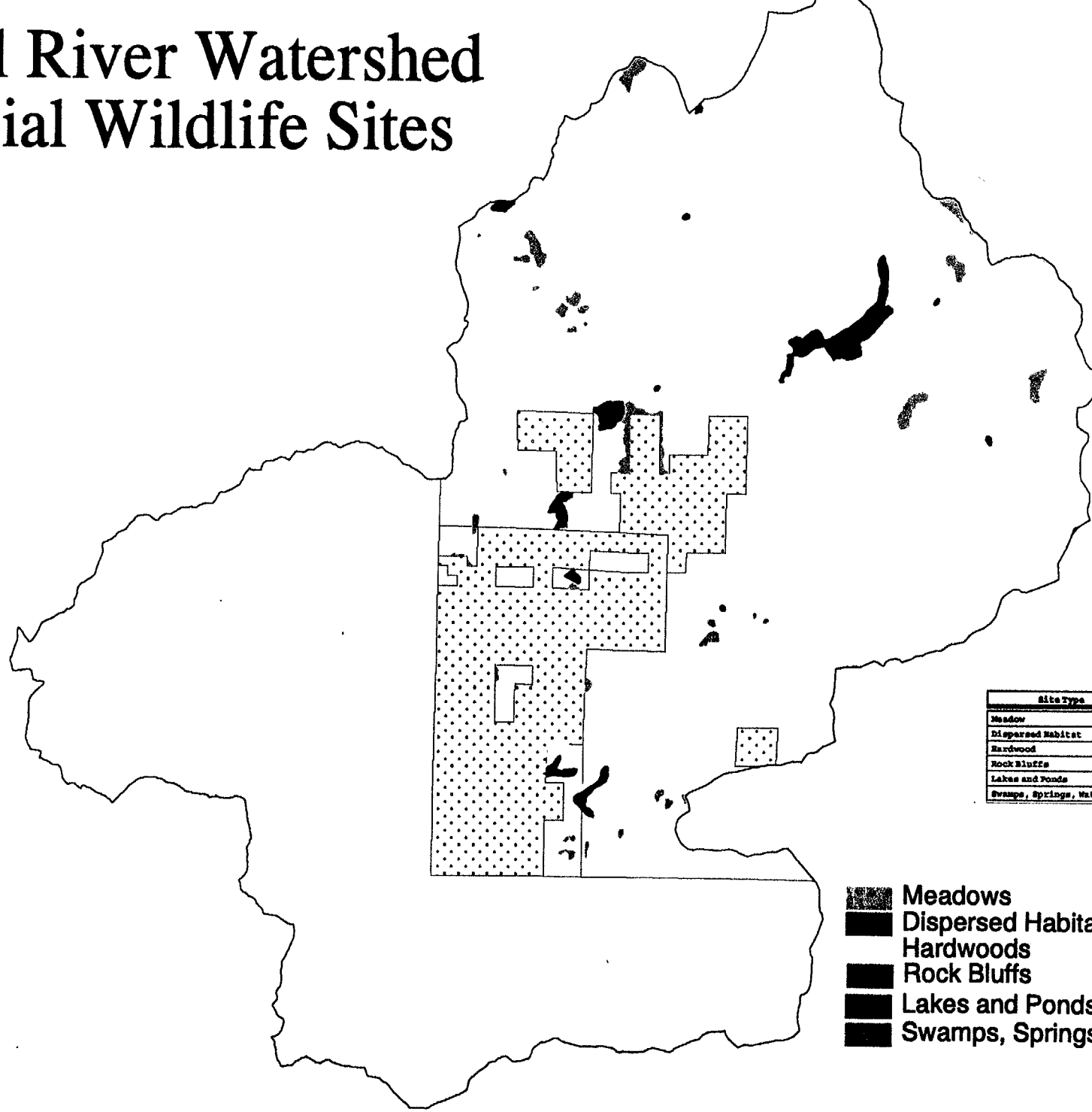


Note: Data derived from PMR polygon data.
Codes 15-19, 22,25,26,28,29,31,32,34 and 39 in the clc_sizest field were considered suitable habitat.
Ultramafic Soils were not considered suitable habitat.

Pistol River Watershed
Areas of Douglas Fir and Hardwoods in Early or Mid Seral Stages
Acres = 19978.44



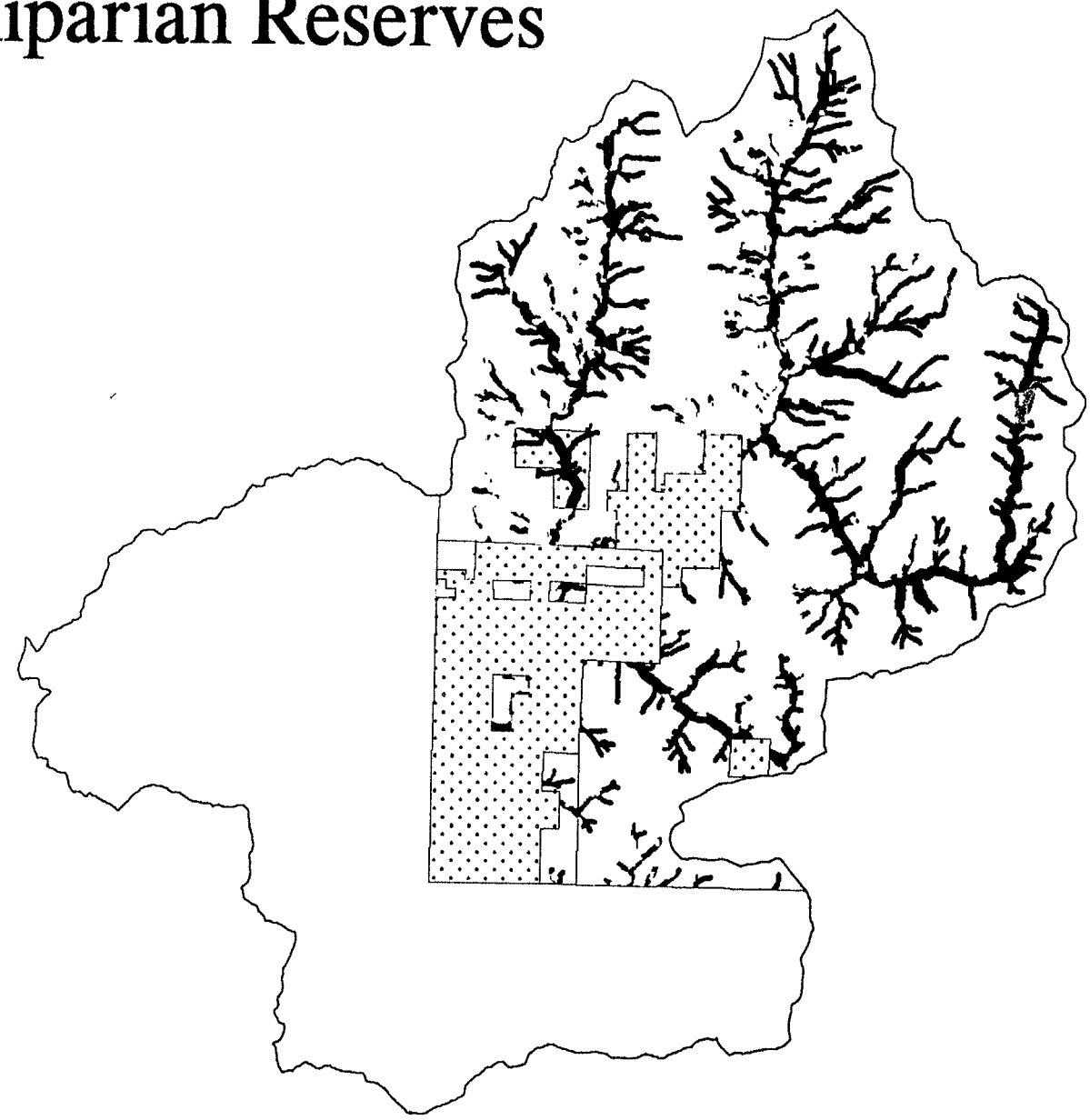
Pistol River Watershed
Special Wildlife Sites



Site Type	Acres
Meadow	592.98
Dispersed Habitat	862.80
Hardwood	86.24
Rock Bluffs	69.10
Lakes and Ponds	28.08
Swamps, Springs, Waterhol	0.95

Meadows
Dispersed Habitat
Hardwoods
Rock Bluffs
Lakes and Ponds
Swamps, Springs, Waterholes

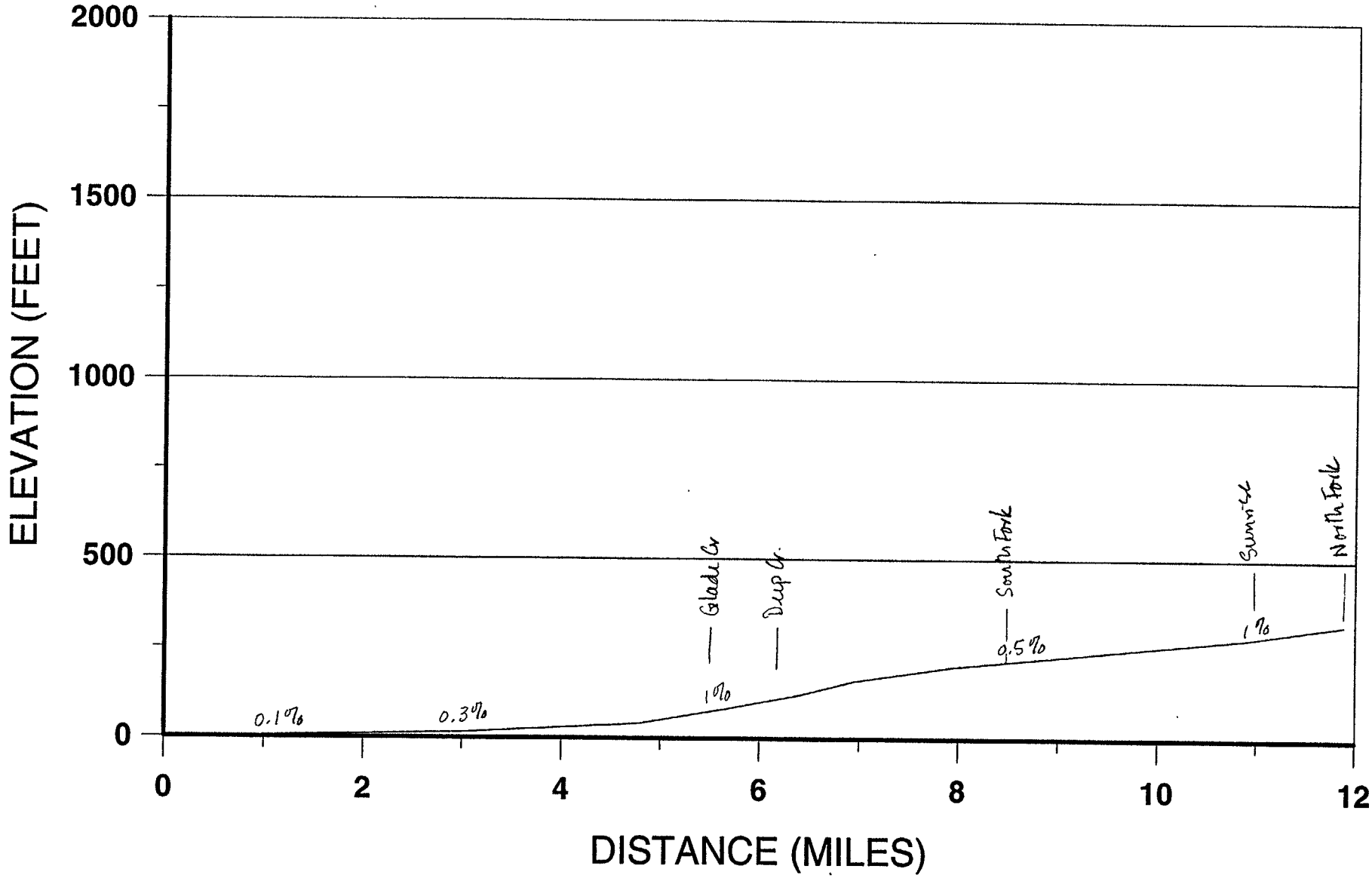
Pistol River Watershed Vegetation Types in Riparian Reserves



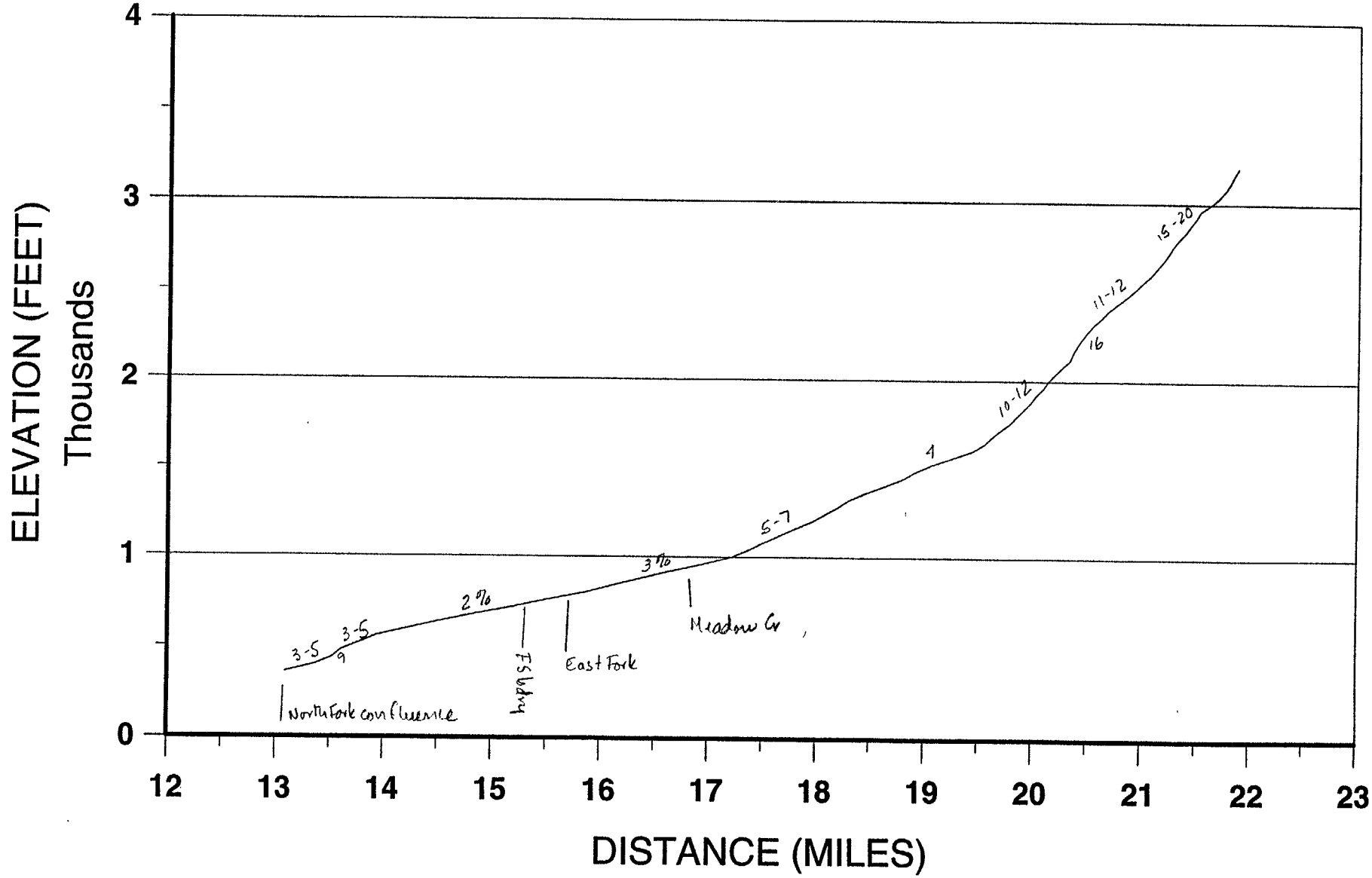
Vegetation	Acres	Percent
conifer	4298.3500	56.87
hardwoods	1394.2000	18.45
meadow	76.5500	1.01
other	1756.7100	23.24
ultramafic	31.8300	0.42

Vegetation Types
- Conifer
- Hardwoods
- Meadow
- Other
- Ultramafic areas
- Private Land within Forest Boundary

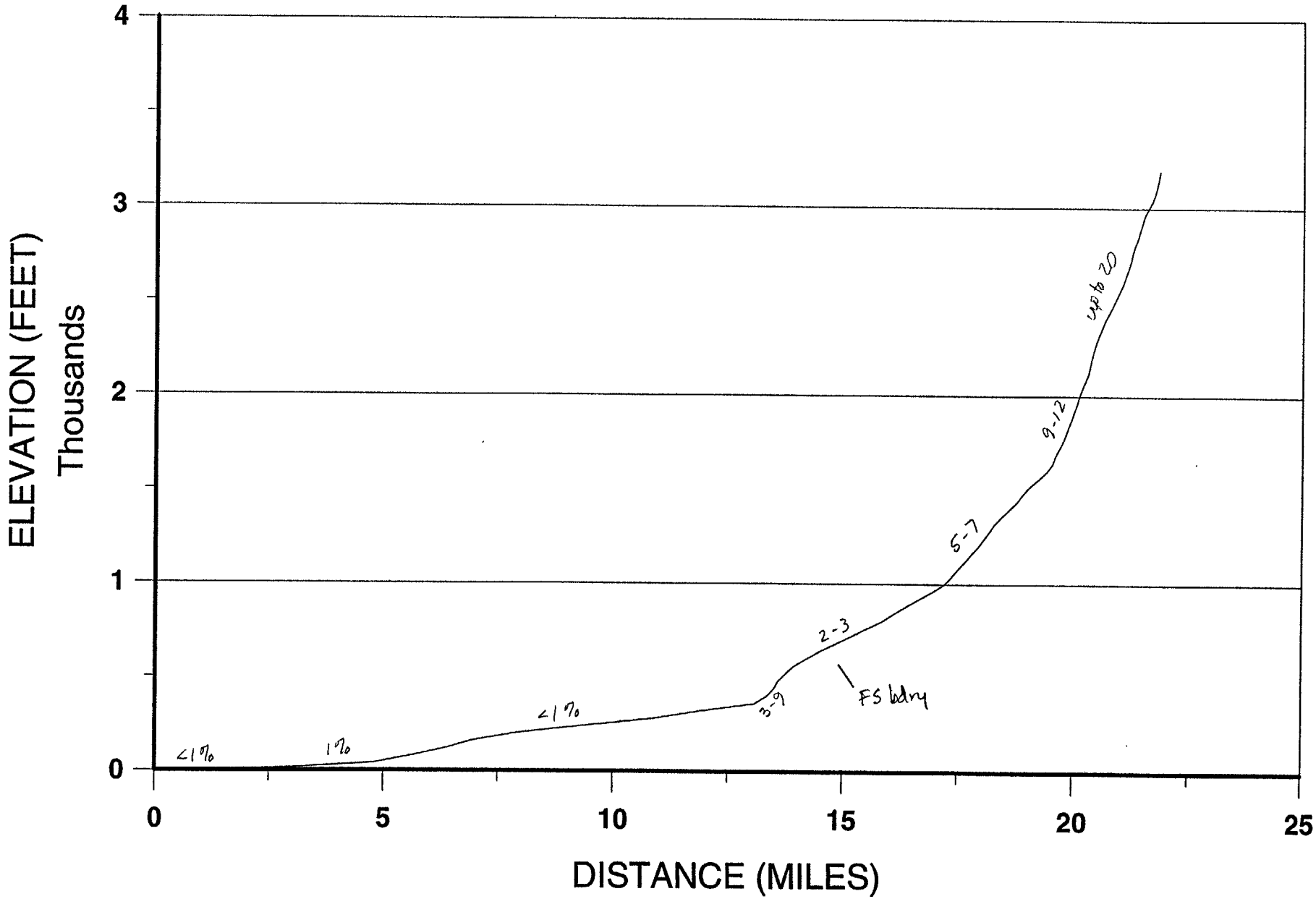
PISTOL RIVER
M.P. 0 TO 12



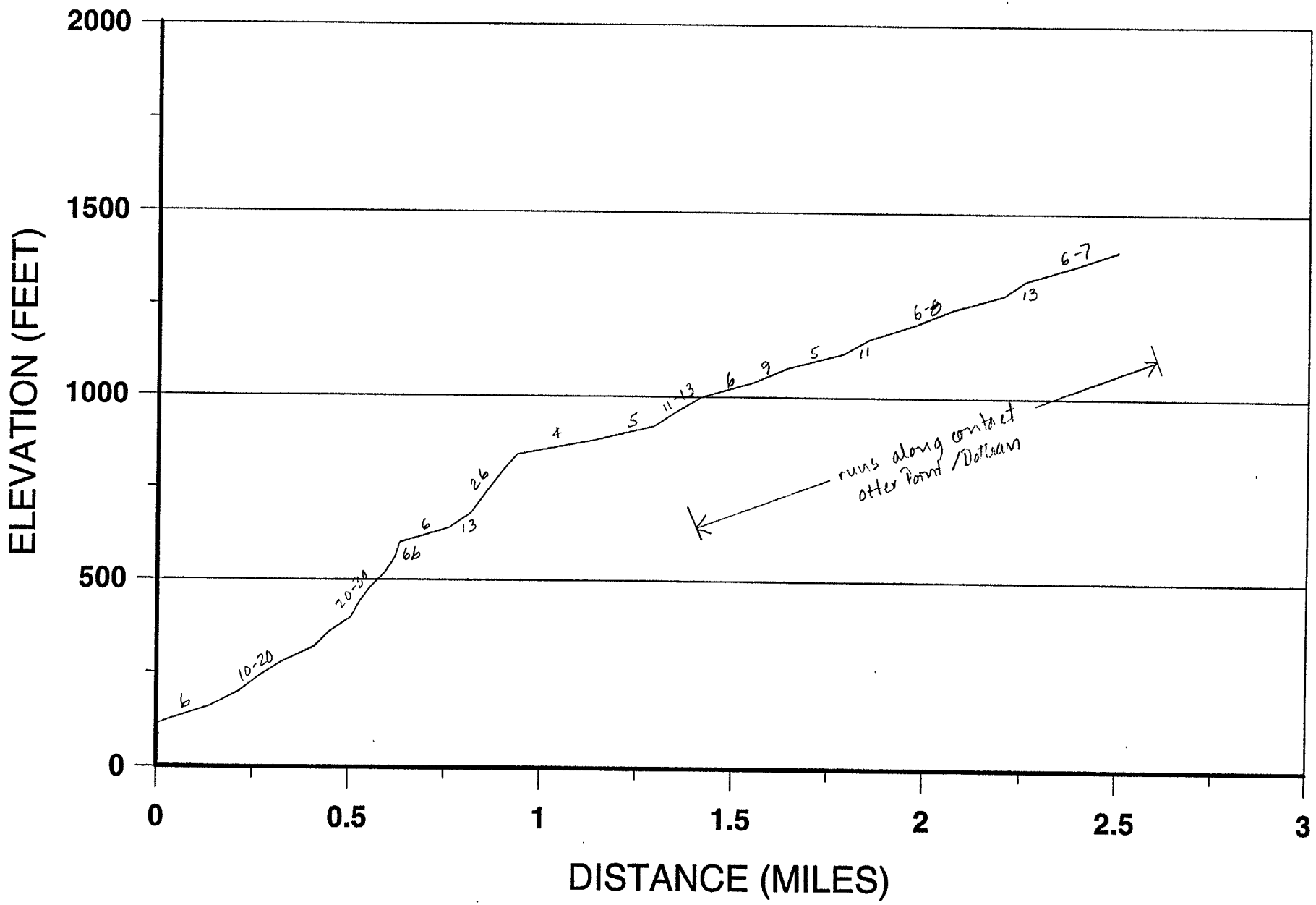
PISTOL RIVER
M.P. 12 TO 24



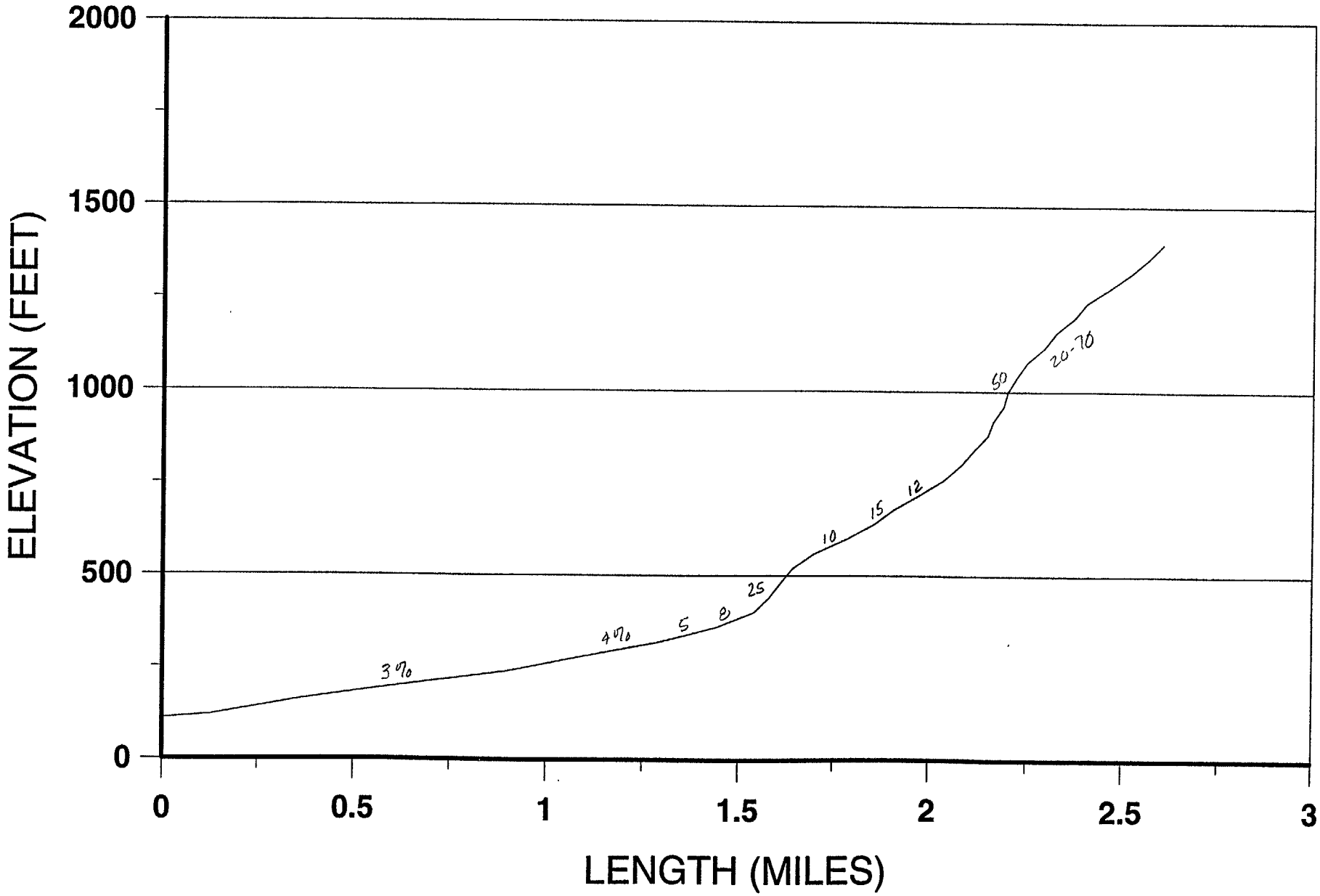
PISTOL RIVER



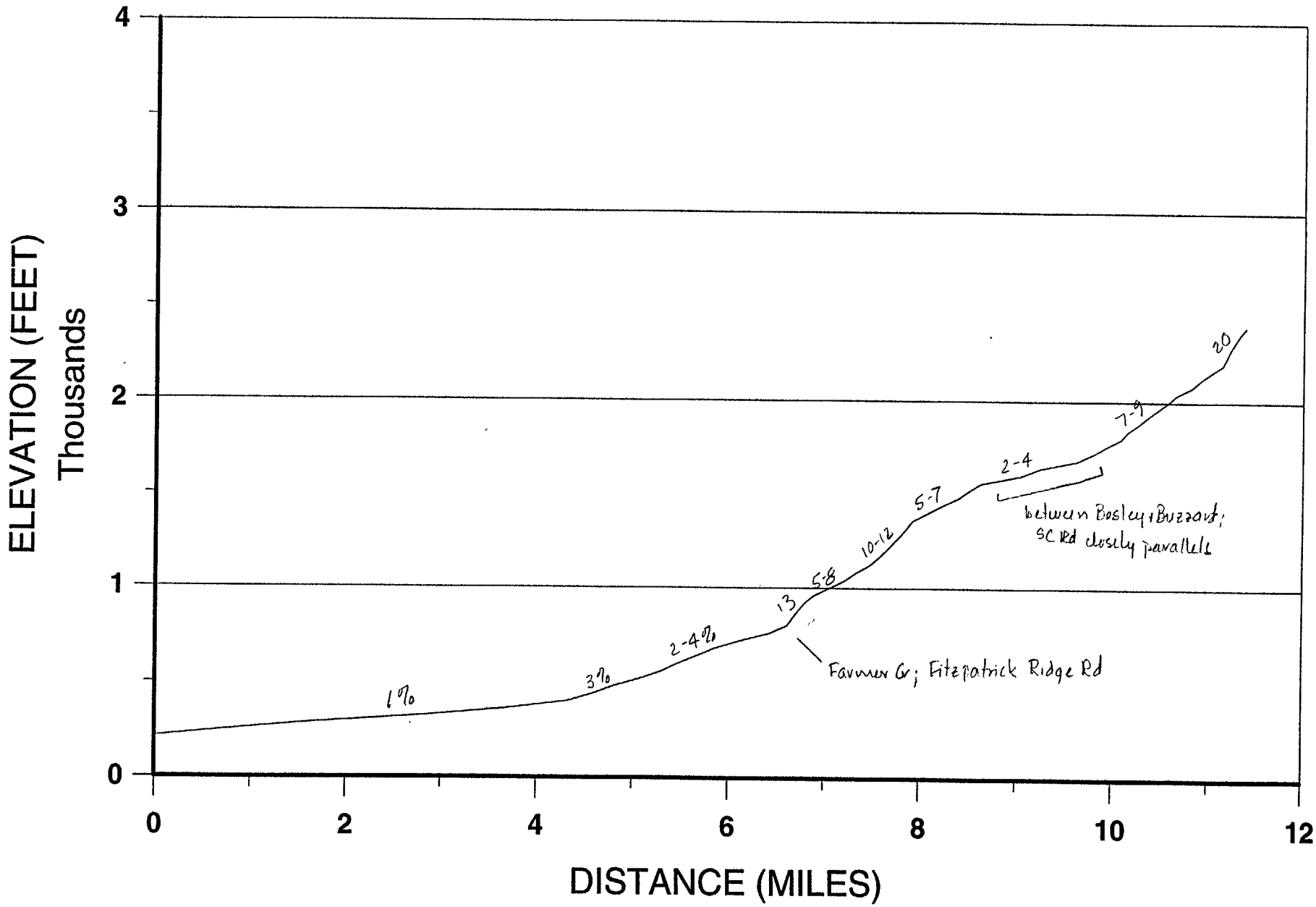
GLADE CREEK


2000
1500
1000
500
0
ELEVATION (FEET)
0
0.5
1
1.5
2
2.5
3
DISTANCE (MILES)
6
10-20
20-30
6b
6
13
26
4
5
11-13
6
9
5
11
6-8
13
6-7
runs along contact
otter Point / Dothan

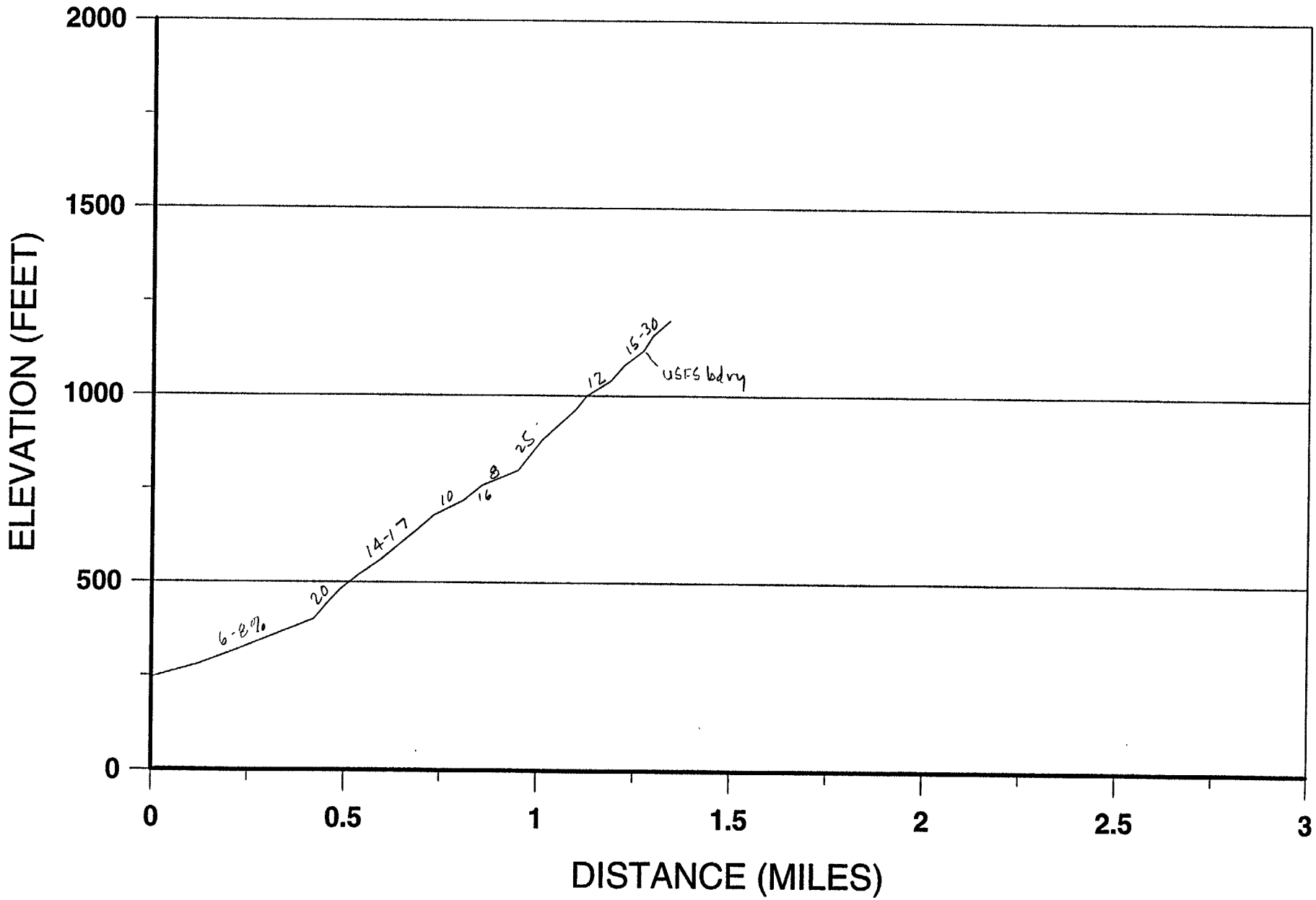
DEEP CREEK


2000
1500
1000
500
0
ELEVATION (FEET)
0
0.5
1
1.5
2
2.5
3
LENGTH (MILES)
3%
4%
5
8
25
10
15
12
50
20-70

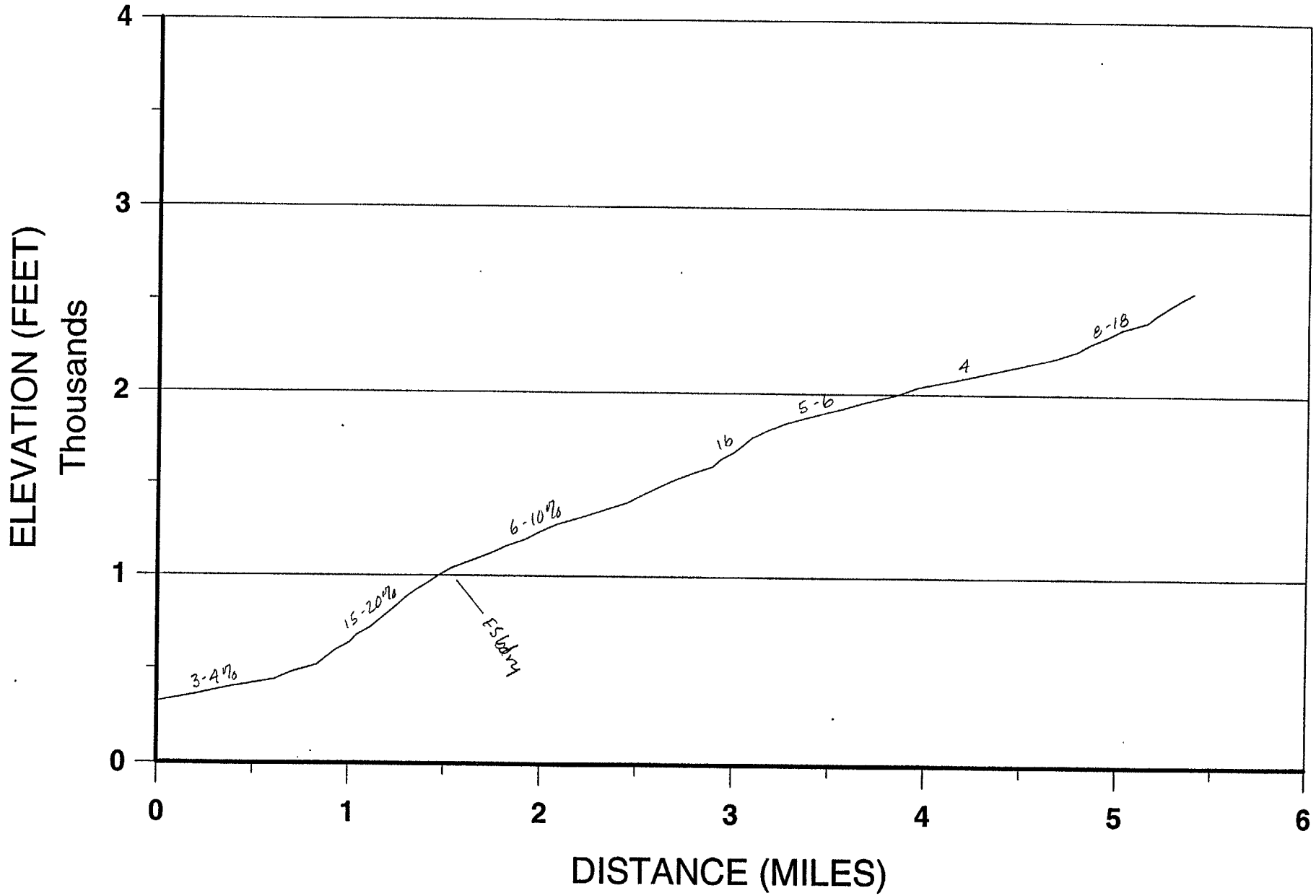
SOUTH FORK PISTOL



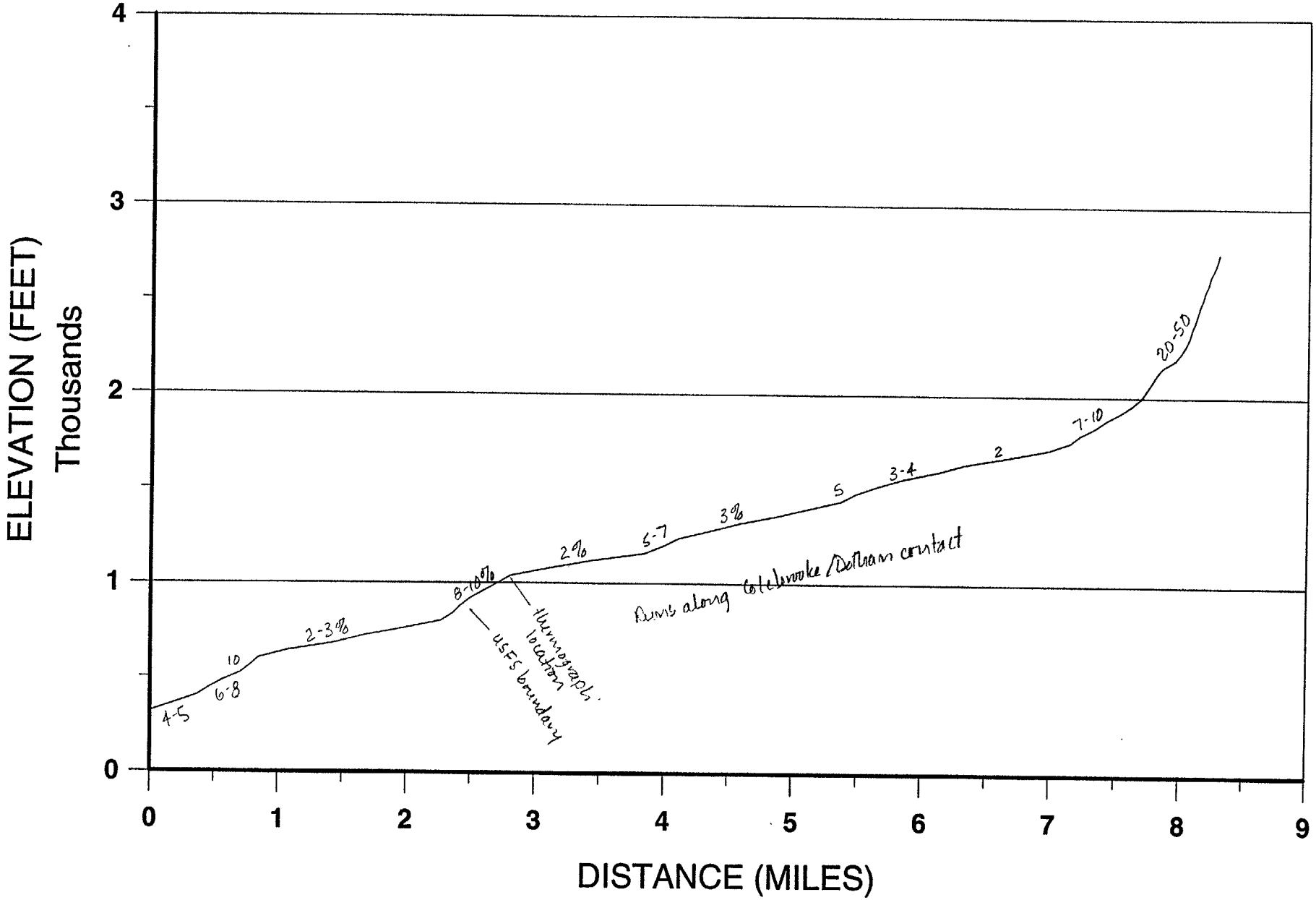
KOONTZ AND DAVIS CREEK



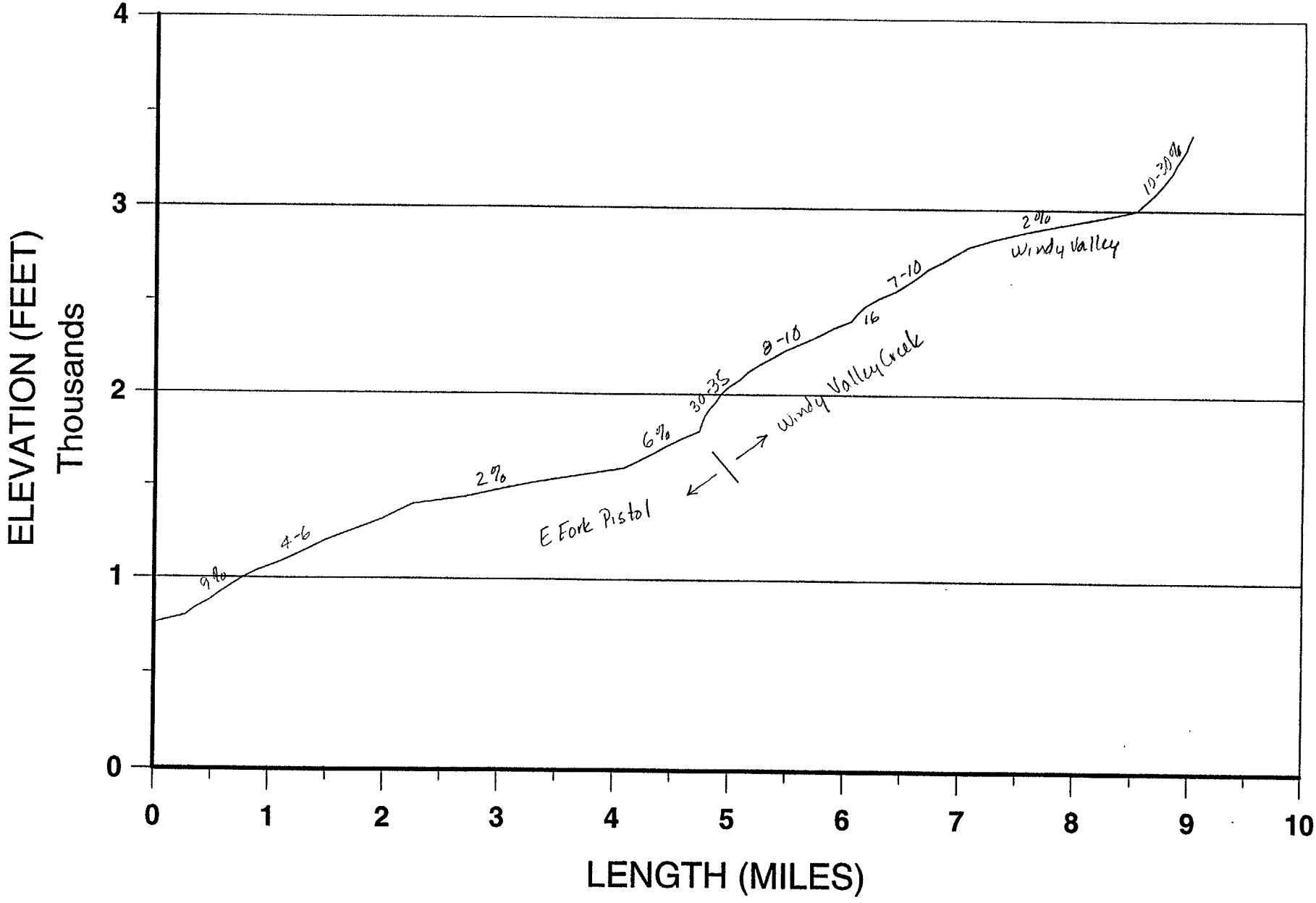
SUNRISE CREEK



NORTH FORK PISTOL



EAST FORK AND WINDY CREEK



MEADOW CREEK