

**SUMMARY:** The U.S. Fish and Wildlife Service (Service) determines endangered status for the Point Arena mountain beaver (*Aplodontia rufa nigra*) under the authority of the Endangered Species Act of 1973, as amended (Act). Limited in distribution to cool, moist areas along the Pacific coast, Mendocino County, California, the Point Arena mountain beaver now occurs in only 10 known sites, comprising a total of about 100 individuals. Within its localized habitat, threats to the Point Arena mountain beaver include livestock grazing, highway construction and maintenance, public access and recreational use, rodent control, exotic plant expansion, housing developments, stream impoundments and irrigations, predation by feral and pet cats and dogs, and agricultural use. A proposal to erect a microwave tower within habitat occupied by the largest known population is the most significant threat at this time. The excavation for the tower, as originally planned, will destroy habitat used by one-half of the estimated 20 Point Arena mountain beavers at that site. Due to the threat posed by this proposal, this listing is effective immediately.

**EFFECTIVE DATE:** December 12, 1991.

**ADDRESSES:** The complete file for this rule is available for inspection by appointment during normal business hours at U.S. Fish and Wildlife Service, 2800 Cottage Way, room E-1803, Sacramento, California 95825-1846.

**FOR FURTHER INFORMATION CONTACT:** Mr. Michael Horton, Wildlife Biologist, at the above address (phone 916/978-4866 or FTS 460-4866).

**SUPPLEMENTARY INFORMATION:**

**Background**

The Point Arena mountain beaver (*Aplodontia rufa nigra*) is a member of the family Aplodontidae, which is represented by a monotypic genus and species. This family is in the order Rodentia, suborder Sciurimorpha and apparently represents the oldest known group of living rodents, the Aplodontids, which are thought to be ancestral to sciurid rodents (Steele 1986).

Taylor (1914) described the Point Arena mountain beaver as a full species (*Aplodontia nigra*), but later Taylor (1918) revised his treatment, reducing the taxon to subspecific status as *Aplodontia rufa nigra*. Although the taxon is geographically isolated, Taylor (1918) felt the revision was justified. The paucity of specimens and the extensive overlap in certain cranial and external characteristics led him to conclude that full species status could not be

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**DEPARTMENT OF THE INTERIOR**

**Fish and Wildlife Service**

**50 CFR Part 17**

**RIN 1018-AB56**

**Endangered and Threatened Wildlife and Plants; Point Arena Mountain Beaver (*Aplodontia rufa nigra*) Determined To Be Endangered**

**AGENCY:** Fish and Wildlife Service, Interior.

**ACTION:** Final rule.

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supported in relation to other California coastal mountain beavers. Several revisions to the species [*Aplodontia rufa*] have been made (Dalquest and Scheffer 1945, Hall and Kelson 1959, Hall 1981), with the Point Arena mountain beaver being maintained as a subspecies.

Certain cranial and external characteristics separate the Point Arena mountain beaver from other subspecies of mountain beavers (Taylor 1918). For example, only *Aplodontia rufa nigra* has black and gray fur on the dorsal surface. The black pelage characteristic of the male and female adult Point Arena mountain beaver is seen as early as July in young of the year. In the other subspecies, coastal individuals tend to be darker than inland animals, though none are as dark as the Point Arena mountain beaver. Osteologically, the outline and breadth of the Point Arena mountain beaver's nasal bones represent a unique cranial characteristic. The Point Arena form is stocky and cylindrical in body shape with a broad, massive, laterally compressed skull. The skull's flat upper surface and lack of postorbital processes are noteworthy (Hall 1981). Mountain beavers possess small eyes, rounded ears, and a distinctive cylindrical stump of a tail. Each forepaw has an opposable thumb and all digits have long, curved claws.

Three well-differentiated subspecies of mountain beavers, the Humboldt mountain beaver (*Aplodontia rufa humboldtiana*), Point Arena mountain beaver (*A. r. nigra*), and Point Reyes mountain beaver (*A. r. phaea*) are distributed along the north coast of California. Each of these is geographically separated by considerable distances (Steele 1986). Approximately 80 miles separate the Point Arena mountain beaver from the range of its northern conspecific, the Humboldt mountain beaver. To the south, the range of the Point Reyes mountain beaver begins about 60 miles from the southern limit of the distribution of the Point Arena taxon.

Of the seven subspecies of mountain beaver occurring on the coast or inland, the Point Arena form has the most limited distribution and is found only in coastal Mendocino County, California. Historical collection records noted populations between the town of Point Arena and Alder Creek, a distance of about 6.8 miles (Camp 1918). Data from the Christiansen Ranch area increased the known range about 5 miles further north (Pfeiffer 1954). In 1981 Steele attempted to relocate the four historically known populations, but

found that only the population at Alder Creek remained. He did, however, discover three previously unrecorded populations (Steele 1982). These areas were resurveyed by Steele in 1986, resulting in a total of eight known populations, four of which were observed during the 1981 field survey (Steele 1982, 1986). In 1989 and 1991, two additional populations were discovered at Manchester State Beach (Dale Steele, ecologist, California Department of Transportation, pers. comm. 1989; Steele, pers. comm. 1991). All 10 populations are located within the previously described geographical range of about 12 miles along the coast line. Populations are found at Mallo Pass Creek, Irish Creek, Alder Creek, Manchester State Beach (four sites including the American Telephone and Telegraph communication facility), Lagoon Lake, Minor Hole Road, and Point Arena, Mendocino County, California (Steele 1982, 1986; Steele, pers. comm. 1989 and 1991).

Mountain beavers are restricted in geographic distribution to cool, moist areas receiving heavy rainfall (25–60 inches per year) along the Pacific Coast and Sierra Nevada, extending from southern British Columbia to central California (Steele 1986). The Point Arena subspecies occurs only in Mendocino County, California, within the coastal, narrow, and irregularly shaped valleys. These valleys have relatively warm temperatures because the ridges block the cool, moist onshore ocean breezes, thereby limiting the potential moist habitat required by the Point Arena mountain beaver.

Point Arena mountain beaver populations have been located on steep, northfacing slopes or in protected gulches. Burrowing activities usually are conducted under dense vegetation, where moisture conditions make the soil relatively easy to excavate. Micro-habitat conditions include an abundant supply of food plants and moderately deep and firm soil with good drainage (Steele 1986). Those populations on coastal strand/coastal scrub habitat are less sheltered; however, strong winds and a persistent marine influence prevent extreme fluctuations in temperature (Steele 1986).

Point Arena mountain beavers are found in habitats with four basic types of vegetation: Coastal scrub, coniferous forest, riparian, and stabilized dunes (coastal strand). Habitat types for the 10 populations are as follows: Point Arena—coastal scrub, Minor Hole Road—coastal scrub/riparian, Lagoon Lake—coastal scrub, Alder Creek—coastal scrub/riparian, Mallo Pass

Road—coastal scrub/riparian, Manchester State Beach (three populations)—coastal scrub/coastal strand, American Telephone and Telegraph communication facility at Manchester State Beach—coastal scrub/coastal strand, and Irish Gulch—coastal scrub/riparian/coniferous forest.

Coastal scrub species include cow-parsnip (*Heracleum lanatum*), coyote brush (*Baccharis pilularis*), wax-myrtle (*Myrica californica*), California blackberry (*Rubus vitifolius*), salal (*Gaultheria shallon*), and poison-oak (*Rhus diversiloba*). Coastal strand habitat consists of lupine (*Lupinus arboreus*), coyote brush, coast goldenrod (*Solidago spathulata*), dune grasses, and ice plant (*Mesembryanthemum* spp.). At the Irish Creek population site, the coniferous overstory is composed primarily of Douglas-fir (*Pseudotsuga menziesii*), grand fir (*Abies grandis*), and bishop pine (*Pinus muricata*). Riparian and coastal scrub species are prevalent in the understorey of the Irish Creek site and include species such as thimbleberry (*Rubus parviflorus*), nettle (*Urtica* spp.), sword fern (*Polystichum munitum*), salmonberry (*Rubus spectabilis*), and elderberry (*Sambucus* spp.). Riparian vegetation is found in conjunction with other habitat types at Minor Hole Road, Alder Creek, Irish Gulch, and Mallo Pass Road and includes skunk-cabbage (*Lysichiton americanum*), giant horsetail (*Equisetum telmateia*), willows (*Salix* spp.), red alder (*Alnus oregona*), wood rose (*Rosa gymnocarpa*), and California blackberry (Hardham and True 1972).

At the four sites on Manchester State Beach (one of which is referred to as the American Telephone and Telegraph communication facility), the Point Arena mountain beaver occupies stabilized sand dunes with coastal scrub components. The Manchester State Beach sites, located about 0.25 miles apart, are significantly different than the other known Point Arena mountain beaver locations because they provide less cover, fewer food plants, and poorer burrowing substrate. Although mountain beavers usually construct underground burrows, those inhabiting the coastal strand burrow under shrubby vegetation. Because temperatures are still relatively mild with minimum fluctuations owing to the marine influence, the Point Arena mountain beaver is able to tolerate these surface ambient temperatures in the coastal strand environment.

No data are available on historical population densities for the Point Arena mountain beaver. However, estimates for other mountain beaver subspecies

range from 1.4 to 2.2 individuals per acre (Neal and Borrecco 1981, Lovejoy and Black 1979) up to 9 (or 16 temporarily) animals per acre (Voth 1968).

During a 1985-1986 status survey, Steele (1986) found a total of 41 active burrow systems in 8 populations (range 2-9 animals/system). He estimated that the number of individuals per site ranged from 3 to 10 or more, for an overall subspecies population estimate of approximately 41-55 individuals. The Point Arena mountain beavers occupied roughly 24 acres of a total of approximately 83 acres of available habitat (Steele 1986). Sites vary in size from 3.7 to 19.8 acres of which about 1.5 to 8 acres were occupied by the mountain beavers (Steele 1986). By incorporating data from the 1988 and 1991 surveys (Steele, pers. comm.), the number of sites was increased to 10, the total population estimate to 100, and the total available habitat to about 100 acres.

Mountain beavers live within an extensive system of tunnels usually constructed about a foot from the surface (Steele 1986). Runways are enlarged to accommodate nests and for food storage facilities (Steele 1986). These burrows are found only in portions of the home range (Martin 1971). Limited data on the Point Arena mountain beaver indicate that an average of one or two animals is found within individual burrow systems (Steele 1986).

Radio-telemetry studies indicate that adult mountain beavers had home ranges varying from 0.01 to 0.08 acres size (mean 0.04 acres), with no significant differences between males and females (Martin 1971). Adults do not seem to range far from the burrow entrances as evidenced by a maximum recorded distance of about 140 feet (Martin 1971). During the breeding season individuals may travel outside the calculated home range. In the summer months, young mountain beavers use the burrow systems as well as ground surface to disperse from the nest (Steele 1986).

Mountain beavers appear to be solitary in their social structure, except during the breeding season, and intraspecifically defined their nests and burrows (Martin 1971). Even though home ranges may overlap, each mountain beaver is solitary when feeding (Steele 1986).

*Aplodontia rufa nigra* prefers to forage on succulent herbaceous plant material and the deciduous tree bark and leaves forming the understory (Steele 1982, 1986). Species frequently consumed by the mountain beaver include sword fern, cow parsnip, salal,

nettle, salmonberry, and lupine. It appears that the Point Arena mountain beaver is primarily a nocturnal forager (Steele 1986).

In comparison to the abilities of many other rodents, the mountain beaver is physiologically somewhat limited in maintaining its water balance and in thermoregulating (Dolph *et al.* 1962; Greenbaum and Dicker 1963; House *et al.* 1963; Druzinsky 1983, 1984; Johnson 1971; Kinney 1971; and others). Anatomical and physiological data indicate that mountain beavers are incapable of producing a concentrated urine and, therefore, require substantial daily amounts of water. It is thought that the limited osmoregulatory abilities of the mountain beaver are responsible for its localized distribution, confining it to cool, moist areas (Nungesser and Pfeiffer 1965). Work with *Aplodontia rufa pacifica* in Oregon found that the nest and burrow system effectively mediate warm surface temperatures and seasonal changes in humidity (Johnson 1971, Kinney 1971). Further evidence stems from work on dehydration studies of mountain beavers such as the finding that *A. rufa* has a limited ability to increase reabsorption of sodium in the kidney when dehydrated (Schmidt-Nielsen and Pfeiffer 1970). To excrete this excess sodium requires the loss of water via the urine. Further, there are no indications that mountain beavers can enhance evaporative water loss when heat-stressed, a method used by some mammals to maintain homeothermy (Goslow 1964, Johnson 1971, Kinney 1971).

In mountain beavers, it appears that the relatively primitive thermoregulatory ability limits the animal's surface activity to moderate temperature days. Mountain beavers can thermoregulate adequately only over a relatively narrow band of ambient temperatures (6 to 16 degrees C) which corresponds to the normal temperature range within the burrows (Kinney 1971). Animals exposed to environmental temperatures of around 30 degrees C may experience the upper thermal tolerance limit (Kinney 1971). When surface temperatures are too warm, the mountain beaver will either seek refuge in its burrow or orient its body to maximize its ability to lose body heat passively. In laboratory experiments, mountain beavers undergoing heat stress responded by decreasing metabolic and respiratory rates and by changing posture to maintain a relatively constant body temperature (Steele 1986).

Mountain beavers usually reach sexual maturity during the second year. Because it is monestrous and all females

in a given population ovulate at about the same time (during a period of 5-7 weeks in mid or late winter), the breeding season is quite limited (Pfeiffer 1958). It appears that the gestation period is 28 to 30 days (Pfeiffer 1958). In late February and March, the litter is born, containing usually two to three, infrequently four, individuals (Steele 1986). Only one litter per female is produced per year (Steele 1986).

Demographic information such as age class structure and distribution on the Point Arena mountain beaver is sparse. Data from *Aplodontia rufa pacifica* indicate an adult sex ratio of 1.2 to 1.0 (male to female) (Lovejoy and Black 1979). Other *Aplodontia* subspecies are known to have survived for 6 or more years (Lovejoy and Black 1979).

Because of their burrowing habits and foraging in gardens, croplands, and forests, mountain beavers can cause extensive damage and are considered a nuisance in some areas (Steele 1986). For example, in certain areas of coastal Oregon and Washington, the mountain beaver is numerous and regarded as a pest (Scheffer 1929, Phillips 1982). Mountain beavers can be particularly destructive in Douglas-fir forests by clipping conifer seedlings, basal girdling saplings, and undermining roots by burrowing (Neal and Borrecco 1981). However, none of the subspecies endemic to California are known to cause substantial damage to crops, nor are they generally found in intensively managed forest tracts.

Of the 10 known populations of Point Arena mountain beaver, 3 occur totally on private land (Minor Road, Lagoon Lake, and American Telephone and Telegraph communication facility). Four others (Point Arena, Alder Creek, Irish Gulch, and Mallo Creek) are partly on private land. The State of California has jurisdiction over three of four mountain beaver locations at Manchester State Beach (California Department of Parks and Recreation), and also owns portions of Alder Creek, and highway rights-of-way on the Point Arena, Irish Gulch, and Mallo Creek sites. The other mountain beaver site at Manchester State Beach occurs on the communication facility owned by the American Telephone and Telegraph Company; this private land is encircled by State land (Manchester State Beach). On Minor Road, the County of Mendocino has a highway right-of-way.

The Point Arena mountain beaver is included as a category 1 taxon in the Service's most recent Animal Notice of Review, published in the *Federal Register* on January 6, 1989 (54 FR 554). For taxa in this category, the Service has

substantial information on hand to support the biological appropriateness of proposing to list such taxa as endangered or threatened species. A proposed rule to list this species as endangered was published in the **Federal Register** on February 15, 1991 (56 FR 6353). The comment period closed on April 16, 1991.

The Point Arena mountain beaver, with a limited distribution (i.e., 10 sites) and narrow physiological habitat tolerances, faces threats from urban development, predation, human disturbance, rodent control activities, and decreased genetic variability due to the small number of remaining individuals. This species faces an immediate threat from a proposal to erect a microwave tower within habitat occupied by the largest known population. The project as originally planned would destroy habitat used by 10 out of the 20 animals at this site. With only 100 Point Arena mountain beavers remaining, the loss of any individuals would be significant and could be potentially devastating to the subspecies. Because of the immediate threat posed by this proposal, the Service finds that good cause exists for this rule to take effect immediately upon publication in accordance with 5 U.S.C. 553(d)(3).

#### Summary of Comments and Recommendations

In the February 15, 1991, proposed rule, all interested parties were requested to submit comments or suggestions concerning the proposal. Appropriate State agencies, county governments, Federal agencies, scientific organizations, and other interested parties were contacted and requested to comment. Newspaper notices were published in the Independent Coast Observer and the Pacific Coast News inviting the public to comment. Comments particularly were sought concerning:

(1) Biological, commercial trade, or other relevant data concerning any threat (or lack thereof) to the Point Arena mountain beaver;

(2) The location of any additional populations of this species and why any habitat should or should not be determined to be critical habitat as provided by section 4 of the Act;

(3) Additional information concerning the range and distribution of this species; and

(4) Current or planned activities in the subject area and their possible impacts on this species.

No public hearing was requested or held. The Service received a total of 10 public comments. Nine comments were

received in support of the proposed listing; one comment opposed this action. Of these, six were received from individuals in the Point Arena area; one from the Mendocino District of the Department of Parks and Recreation; one from the Department of Fish and Game, Sacramento, California; and two others from individuals outside the Point Arena area. One letter expressed concern about the low population levels of the species, and four expressed concern about the decreasing habitat availability.

Dale T. Steele, an ecologist for the California Department of Transportation, confirmed the accuracy of the information in the proposed rule concerning the geographical separation of the populations. However, from personal investigation, he now has found 10 known populations of Point Arena mountain beaver rather than the 9 previously reported. Four distinct populations are now known to occur at Manchester State Beach instead of the three reported in the proposal. Mr. Steele also estimates a population of 100 individuals rather than the 51-65 individuals stated in the proposal. The appropriate changes have been made in the final rule. These revised population estimates do not affect the need to list the species. In addition, Mr. Steele reports the finding of a dead Point Arena mountain beaver that was killed by a domestic dog. This is the first finding of this nature known to the Service. Mr. Steele also noted that Point Arena mountain beaver burrows are typically closer to one foot in depth rather than several inches, as stated in the proposed rule. Again, the appropriate change has been made in the final rule.

Another commenter expressed concern about the impacts of several construction projects on Point Arena mountain beaver in the area—the Point Arena wharf project on the bank north of the Point Arena creek, and the construction of at least three gravel plants in the area.

The Service received one comment opposing listing, which claimed that the populations of this subspecies have increased considerably during the last 25 years and that it is not likely to decline. The commenter also stated that the species does not inhabit moist low land areas and that cattle tend to avoid areas used by the mountain beaver. No documentation was submitted to support these statements. The best scientific and commercial information available to the Service does not support this position.

#### Summary of Factors Affecting the Species

After a thorough review and consideration of all information available, the Service has determined that the Point Arena mountain beaver (*Aplodontia rufa nigra*) should be classified as an endangered species. Procedures found at section 4(a)(1) of the Endangered Species Act (16 U.S.C. 1531 *et seq.*) and regulations (50 CFR part 424) promulgated to implement the listing provisions of the Act were followed. A species may be determined to be an endangered or threatened species due to one or more of the five factors described in section 4(a)(1). These factors and their application to the Point Arena mountain beaver (*Aplodontia rufa nigra*) are as follows:

##### A. The Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Range

Although there are no estimates available on the amount of historical habitat for the Point Arena mountain beaver, given the amount of habitat that already has been developed for urban and agricultural purposes, it is likely that substantial habitat loss has occurred. Livestock production, dating from the time of introduction of cattle by the Spanish, may well have substantially modified historical *Aplodontia* habitats (Steele 1986). Earlier known Point Arena mountain beaver populations were situated near farming or ranching activities. Livestock grazing and brush clearing have eliminated much coastal scrub habitat in the area (Steele 1986). Moreover, cattle have stepped on *Aplodontia* burrows and destroyed runways (Steele 1986). Of the 10 presently known populations, 5 are found near agricultural or ranch land and are subject to continued impacts from these activities (Steele 1986).

Construction of private and county roads has resulted in the loss of habitat. New home construction at Irish Beach and in Irish Creek upslope from the mountain beaver population has affected the habitat quality. Loss of habitat, dumping of trash, and an increase in predation by feral and non-feral house pets may have reduced the Point Arena mountain beaver population at Irish Creek. About 150 homes have been completed as of 1991, as part of a planned development of 1,091 homes (Steele 1986; Sharon Fraser, Irish Beach Rental Agency, pers. comm. 1991). An adjunct part of this project included constructing a water diversion system at Mallo Creek to supply the domestic water requirements of the development.

Recently the Coastal Commission approved the withdrawal of up to 50 cubic feet per second of water from Mallo Creek for residential use at the Irish Beach subdivision (B. Noah Tilghman, California Coastal Commission, letter dated June 22, 1988). Such a water diversion has the potential to adversely affect the mountain beaver by reducing the amount and quality of available habitat. Ancillary facilities including a market, motel, and offices also were tentatively planned for construction (Steele 1986). The latest revision to the Mendocino County Land Use Plan shows increasing housing developments, creating a potential for additional indirect and direct disturbance to the mountain beavers in the Irish Creek area.

A subdivision also has been planned for Lagoon Lake. Although the roads are now in, only a couple of homes have been built there. However, if development proceeds as originally envisioned, homes could be built up to several hundred feet away from the Point Arena mountain beaver site at Lagoon Lake. Some of the lots that are part of the Hunter's Lagoon project at Lagoon Lake have been purchased by the California Department of Parks and Recreation as additional land for Manchester State Beach (Dave Barlett, California Department of Parks and Recreation, pers. comm.). With such close urban development, the mountain beavers will be subject to increased human disturbance and probably augmented predation pressure by house pets. Urban development in the Lagoon Lake area may adversely modify existing mountain beaver habitat and reduce the number of animals.

The Irish Beach-to-Manchester Alternative Coastal Trail has been proposed to provide non-vehicular beach access at Irish Beach, Alder Creek Beach Road, Kinney Road, and Stoneboro Road. This project includes construction of a parking area, construction of an interpretative center, and establishing access to the proposed trail at both Irish Creek and Alder Creek. This would increase human disturbance to the mountain beaver population and result in a reduction in habitat quality. There is no information available to indicate that the Point Arena mountain beaver can tolerate this degree of human disturbance. However, even a limited effect on the mountain beaver's reproductive success or mortality rates from predation could extirpate this population of approximately five animals.

It is likely that there has been previous habitat loss at the American

Telephone and Telegraph communication facility resulting from construction and secondary impacts from use of the facility. It is not known how large this population was prior to construction of the communication facility; however, the present population of approximately 20 animals is now threatened by the proposed construction of a microwave tower. The proposed project would involve the excavation of a portion of this 3.7 acre site (Steele, pers. comm. 1991).

#### *B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes*

Overutilization is not known to be a problem. However, the very low number of individuals at these isolated remaining sites makes each population vulnerable to extirpation from collection for scientific or other purposes.

#### *C. Disease or Predation*

Predation by domestic and feral dogs, as well as cats, is a mortality factor for mountain beaver, particularly in sites located adjacent to existing urban and agricultural developments such as at Irish Gulch, Alder Creek, and Point Arena. This conclusion is supported by the discovery of a Point Arena mountain beaver which was killed by a domestic dog (Steele, pers. comm. 1991). The impact of this predation pressure on such small populations has the potential to become critical, since one determined predator could seriously impact, and possibly even extirpate, any of the remaining populations.

#### *D. Inadequacy of Existing Regulatory Mechanisms*

The California Department of Fish and Game considers the Point Arena mountain beaver a "Species of Special Concern" and is in the process of preparing the documentation to request that the State Fish and Game Commission designate this taxon as endangered. Although the California Department of Fish and Game requires special authorization (either a collecting permit or memorandum of understanding) to collect this subspecies for scientific purposes, there is no legal status to protect its habitat. Furthermore, because the Point Arena mountain beaver is classified by the State of California as a non-game animal, farmers and/or other landowners may legally take the animals without obtaining a permit if the animals are deemed destructive to property such as crops.

All known Point Arena mountain beaver populations are within the Coastal Zone and, therefore, subject to

the provisions of the California Coastal Act (California State Public Resources Code, Division 20; California Coastal Act of 1976). The primary goal of the Coastal Act is to preserve and protect natural resources, prime agricultural land, and timber land. The Coastal Commission is authorized to approve only those activities that are dependent on these resources. However, activities such as dredging, channelization, construction of pipelines, transmission lines, water diversions, and existing agricultural operations may be permitted. Local coastal plans must be developed by coastal cities and counties and include a land use plan, zoning ordinances, and zoning maps. A land use plan has been developed for the Inverton Planning Area (Land Use Plan: Mallo Pass Creek to Inverton Road). This planning area plus a small section of the Navarro River to Mallo Pass Creek Planning Area includes the entire known distribution of the Point Arena mountain beaver. However, this plan does not contain any specific actions designed to protect the mountain beaver or its habitat.

The Coastal Act and Mendocino County Land Use Plan provide indirect habitat protection to the mountain beaver. However, such land use plans are not required to minimize activities adjacent to sensitive habitat such as construction of housing tracts, diversion or retention of drainage waters, increased human intrusion, or adverse impacts by livestock. Further, mountain beavers are not presently protected from development activities or other potentially adverse impacts because there are no regulations or guidelines that protect the animal or its habitat.

#### *E. Other Natural and Manmade Factors Affecting Its Continued Existence*

Construction of roads may reduce or possibly eliminate the ability of young Point Arena mountain beavers to successfully disperse from natal areas. Point Arena mountain beavers may be killed by cars as they attempt to cross roads although none have been recorded to date. Both the Minor Hole Road and Alder Creek populations have burrows near and under roadways (Steele 1986), thus increasing the likelihood that mountain beavers will wander onto the pavement. The nocturnal habits of the animal make their attempts at road crossing even more hazardous.

Rodent control by trapping and baiting is still fairly common along the Mendocino coast and often is associated with residential and family garden practices (Steele 1986). Baits laced with strychnine or anticoagulants are the

most widely used (Steele 1986). Also, wet spots and seeps sometimes are treated with applications of copper sulfate to control sheep liver fluke (Steele 1986). Although there is no information available assessing the impacts of such programs on the Point Arena mountain beaver, these activities represent a potential threat. Maintenance workers at the Campgrounds of America facility near the mountain beaver site at Point Arena placed poison bait and traps out to kill the mountain beavers they mistakenly identified as gophers. It is unknown if any Point Arena mountain beavers succumbed; however, this demonstrates the threat that rodent control activities present and also how an act of vandalism through trapping or application of poisoned bait could severely impact the species. Although no such vandalism has been reported, the potential exists to extirpate these small, disjunct populations.

Several exotic plants occur in Point Arena mountain beaver habitat, including gorse (*Ulex europaeus*), broom (*Cytisus* spp.), pampas grass (*Cortaderia selloana*), and others. In some areas these species have become established and relatively widespread, thereby reducing the quality and quantity of the native ecosystem of the Point Arena mountain beaver.

Because the remaining Point Arena mountain beavers have a localized distribution, they are extremely vulnerable to catastrophic events such as fire, flooding, disease, drought, or earthquake. Such events could eliminate all individuals or further depress the already low population numbers to a point where they could not recover.

Additionally, the population numbers are now sufficiently low so that the effects of inbreeding depression (whereby closely related individuals breed) may result in the expression of a deleterious gene in the population. Individuals possessing such deleterious alleles are less likely to effectively cope with the environmental conditions or to adapt to environmental changes, even relatively minor ones. Moreover, small populations (especially those with less than 50 individuals), are subject to the effects of genetic drift. This means that by chance events the genetic variability eventually will decline in small populations, thus limiting the flexibility of a population to respond to environmental changes. The effects of genetic drift and inbreeding depression are genetically similar. Individual populations of mountain beavers number from about 3 to 20 animals, and, therefore, the genetic effects of small

size are likely to be a significant factor in the taxon's long-term survivability.

Small populations may also suffer from the effects of habitat fragmentation. Subdivision of habitat into smaller blocks of land often is the result of human-related activities such as fire, water diversion, livestock grazing, road construction, and urban development and serves to exacerbate the segregation of the extant populations. Habitat fragmentation, by further reducing population size, increases the probability of genetic drift and inbreeding depression that may result in less vigorous and adaptable populations of mountain beavers.

The Service has carefully assessed the best scientific and commercial information available regarding the past, present, and future threats faced by this species in determining to make this rule final. Based on this evaluation, the preferred action is to list the Point Arena mountain beaver (*Aplodontia rufa nigra*) as endangered. The limited distribution (10 sites), narrow physiological habitat tolerances, small overall population number, and threats of habitat loss from urban development, pesticide application, predation by feral animals as well as house pets, and human disturbance make endangered status warranted in lieu of threatened status. Given these threats and with only about 100 individuals remaining on about 100 acres of habitat, the taxon is now facing extinction. Critical habitat is not being designated for reasons enumerated under the Critical Habitat section.

#### Critical Habitat

Section 4(a)(3) of the Act, as amended, requires that to the maximum extent prudent and determinable, the Secretary designate critical habitat concurrently with determining a species to be endangered or threatened. Because the Point Arena mountain beaver now occurs in small populations (3 to 20 individuals per site) and is limited to 10 known sites with a restricted distribution of about 100 acres, any acts of vandalism, such as trapping, poisoning, or collection, could seriously reduce the outstanding numbers of individuals and cause irreparable harm. Further, interested parties have been notified of the status of the taxon including landowners as well as private, State, city, county, and Federal agencies. Therefore, because the concerned landowners already have been notified and any proposal for critical habitat requires publication of precise location maps in the Federal Register which could result in vandalism or collection, the Service has determined that

designation of critical habitat would not be prudent.

#### Available Conservation Measures

Conservation measures provided to species listed as endangered or threatened under the Endangered Species Act include recognition, recovery actions, requirements for Federal protection, and prohibitions against certain activities. Recognition through listing encourages and results in conservation actions by Federal, State, and private agencies, groups, and individuals. The Endangered Species Act provides for possible land acquisition and cooperation with the States and requires that recovery actions be carried out for all listed species. Potential recovery actions could include establishing a buffer around each population site and excluding further urban or other development within this zone of about 100 acres of total habitat or within adjacent potential habitat; installing protective fencing; implementing cooperative agreements to manage the species; and restricting pesticide application. Such actions may be initiated following listing. The protection required of Federal agencies and the prohibitions against taking and harm are discussed, in part, below.

Section 7(a) of the Act, as amended, requires Federal agencies to evaluate their actions with respect to any species that is proposed or listed as endangered or threatened and with respect to its critical habitat, if any is being designated. Regulations implementing this interagency cooperation provision of the Act are codified at 50 CFR part 402. Section 7(a)(2) of the Act requires Federal agencies to ensure that activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of listed species or to destroy or adversely modify its critical habitat. If a Federal action may affect a listed species or its critical habitat, the responsible Federal agency must enter into formal consultation with the Service. Federal involvement may occur if the Federal Highways Administration provides funding to the California Department of Transportation (Caltrans) to construct new highways or repair existing ones. The American Telephone and Telegraph Company proposed to install a subterminal fiber optics cable in a six-foot deep trench as part of its submarine lightguide cable installation project under its communication facility. In consideration of the mountain beaver on the site, the proposal was modified to bore the cable through the site rather than excavate a six-foot deep trench. If hydroelectric

facilities are proposed for the streams within or adjacent to Point Arena mountain beaver habitat, a Federal Energy Regulatory Commission permit will be required that may incorporate measures to protect the mountain beaver and its habitat. No such hydroelectric facilities are known to be planned.

The Act and its implementing regulations found at 50 CFR 17.21 set forth a series of general prohibitions and exceptions that apply to all endangered wildlife. These prohibitions, in part, make it illegal for any person subject to the jurisdiction of the United States to take (including harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt any such conduct), import or export, transport in interstate or foreign commerce in the course of commercial activity, or sell or offer for sale in interstate or foreign commerce any listed species. It also is illegal to possess, sell, deliver, carry, transport, or ship any such wildlife that has been taken illegally. Certain exceptions apply to agents of the Service and State conservation agencies.

Permits may be issued to carry out otherwise prohibited activities involving endangered wildlife species under certain circumstances. Regulations governing permits are at 50 CFR 17.22 and 17.23. Such permits are available for scientific purposes, to enhance the propagation or survival of the species, and/or for incidental take in connection with otherwise lawful activities. In some instances, permits may be issued during a specified period of time to relieve undue economic hardship that would be suffered if such relief were not available.

#### National Environmental Policy Act

The Service has determined that an Environmental Assessment, as defined under the authority of the National Environmental Policy Act of 1969, need not be prepared in connection with regulations adopted pursuant to section 4(a) of the Endangered Species Act of 1973, as amended. A notice outlining the Service's reasons for this determination was published in the *Federal Register* on October 25, 1983 (48 FR 49244).

#### References

Camp, C.L. 1918. Excavations of burrows of the rodent *Aplodontia* with observations on the habitats of the animal. University of California Publications in Zoology 17:517-535.

- Dalquest, W., and V. Scheffer. 1945. The systematic status of the races of the mountain beaver (*Aplodontia rufa*) in Washington. *Murrelet* 26:34-37.
- Dolph, C., H. Braun, and E. Pfeiffer. 1962. The effect of vasopressin upon urine concentration in *Aplodontia rufa* (sewelle) and the rabbit. *Physiological Zoology* 35:263-269.
- Druzinsky, R. 1983. Anatomy and EMG of the masseter of *Aplodontia rufa*. First International Symposium of Vertebrate Morphologists. Giessen, W. Germany.
- Druzinsky, R. 1984. Anatomy and EMG of the masseter of *Aplodontia rufa* and *Marmota monax*. Presented at the 1984 Meeting of the University of Illinois, Chicago Chapter of Sigma Xi.
- Goslow, G. 1964. The mountain beaver, *Aplodontia rufa*. Unpublished Masters Thesis. California State University, Humboldt, 74 pp.
- Greenbaum, A., and S. Dicker. 1963. Swelling of mitochondria from the liver and kidney of a primitive rodent. *Biochimica et Biophysica Acta*. 12:402-404.
- Hall, E., and K. Kelson. 1959. The mammals of North America. New York, N.Y. 2 vol.
- Hall, E. 1981. The mammals of North America. Vol. 1, second edition. Wiley and Sons, New York, N.Y.
- Hardham, C., and G. True. 1972. A floristic study of Point Arena, Mendocino County, California. *Madroño* 21:499-504.
- House, E., E. Pfeiffer, and H. Braun. 1963. Influence of diet on urine concentration in *Aplodontia rufa* and the rabbit. *Nature* 199:181-182.
- Johnson, S. 1971. Thermoregulation, microclimate and distribution of *Aplodontia rufa*. Unpublished Ph.D. Thesis, Oregon State University. 164 pp.
- Kinney, J. 1971. Environmental physiology of a primitive rodent (*Aplodontia rufa*). Unpublished Ph.D. Thesis, University of Oregon. 181 pp.
- Lovejoy, G., and H. Black. 1979. Population analysis of the mountain beaver, *Aplodontia rufa pacifica* in western Oregon. *Northwest Science* 52(2):82-89.
- Martin, P. 1971. Movements and activities of the mountain beaver (*Aplodontia rufa*). *Journal of Mammalogy* 52:717-723.
- Neal, F., and J. Borrecco. 1981. Distribution and relationship of mountain beaver to openings in sapling stands. *Northwest Science* 55:79-82.
- Nungesser, W., and E. Pfeiffer. 1965. Water balance and the maximum concentrating capacity in the primitive rodent, *Aplodontia rufa*. *Comparative Biochemical Physiology* 14:289-297.
- Pfeiffer, E. 1954. Reproduction in a primitive rodent, *Aplodontia rufa*. Unpublished Ph.D. Thesis. University of California, Berkeley. 177 pp.
- Pfeiffer, E. 1958. The reproductive cycle of the female mountain beaver. *Journal of Mammalogy* 39:223-235.
- Phillips, J. 1982. Natural 'boomer' control. *Forest Log*. Jan. 1982.
- Scheffer, T. 1929. Mountain beavers in the Pacific Northwest: Their habits, economic status and control. U.S.D.A. Farmers' Bulletin, No. 1958.
- Schmidt-Nielson, B., and E. Pfeiffer. 1970. Urea and urinary concentrating ability of the mountain beaver, *Aplodontia rufa*. *American Journal of Physiology* 218:1370-1375.
- Steele, D. 1982. An ecological survey of mountain beaver (*Aplodontia rufa*) in California. Non-game Wildlife Investigations, Job IV-16.1. California Dept. of Fish and Game.
- Steele, D. 1986. The mountain beaver (*Aplodontia rufa*) in California. Unpublished Master's Thesis, University of California, Davis. 93 pp.
- Taylor, W. 1914. A previously undescribed *Aplodontia* from the middle coast of California. *University of California Publications in Zoology* 12:297-300.
- Taylor, W. 1918. Revision of the rodent genus *Aplodontia*. *University of California Publications in Zoology* 17:435-504.
- Voth, E. 1968. Food habits of the Pacific mountain beaver, *Aplodontia rufa pacifica*. Unpublished Ph.D. Thesis, Oregon State University. 263 pp.

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#### List of Subjects in 50 CFR Part 17

Endangered and threatened species, Exports, Imports, Reporting and recordkeeping requirements, and Transportation.

#### Final Regulation Promulgation

Accordingly, part 17, subchapter B of chapter I, title 50 of the Code of Federal Regulations, is amended as set forth below:

#### PART 17--[AMENDED]

1. The authority citation for part 17 continues to read as follows:

**Authority:** 16 U.S.C. 1361-1470; 16 U.S.C. 1531-1544; 16 U.S.C. 4201-4245; Pub. L. 99-625, 100 Stat. 3500; unless otherwise noted.

2. Amend § 17.11(h) by adding the following, in alphabetical order under Mammals, to the List of Endangered and Threatened Wildlife:

#### § 17.11 Endangered and threatened wildlife.

\* \* \* \* \*

(h) \* \* \*

Species		Historical range	Vertebrate population where endangered or threatened	Status	When listed	Critical habitat	Special rules
Common name	Scientific name						
Mammals:							
Beaver Point Arena mountain	<i>Aplodontia rufa nigra</i>	U.S.A. (CA)	Entire	E	454	NA	NA

Dated: December 4, 1991.

**Richard N. Smith,**

*Acting Director, U.S. Fish and Wildlife Service.*

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