CANDIDATE AND LISTING PRIORITY ASSIGNMENT FORM

SCIENTIFIC NAME: *Synthliboramphus hypoleucus*

COMMON NAME: Xantus's murrelet

LEAD REGION: Region 1

INFORMATION CURRENT AS OF: March 2004

STATUS/ACTION (Check all that apply):
_X_ New candidate
___ Continuing candidate
    ___ Non-petitioned
    _X_ Petitioned - Date petition received: _4/16/02_____
        __ 90-day positive - FR date: _____
        __ 12-month warranted but precluded - FR date: _____
        __ Is the petition requesting a reclassification of a listed species?
    ___ Listing priority change
        Former LP: ___
        New LP: ___
        Latest Date species first became a Candidate: _____
        ___ Candidate removal: Former LP: ___ (Check only one reason)
    ___ A - Taxon more abundant or widespread than previously believed or not subject to a degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status.
    ___ F - Range is no longer a U.S. territory.
    ___ M - Taxon mistakenly included in past notice of review.
    ___ N - Taxon may not meet the Act's definition of A species.
    ___ X - Taxon believed to be extinct.

ANIMAL/PLANT GROUP AND FAMILY: Aves, Alcidae

HISTORICAL STATES/TERRITORIES/COUNTRIES OF OCCURRENCE: California, Mexico

CURRENT STATES/ COUNTIES (optional)/TERRITORIES/COUNTRIES OF OCCURRENCE: California, Mexico

LEAD REGION CONTACT (Name, phone number): Diane Elam, California/Nevada Operations Office, (916) 414-6464

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BIOLOGICAL INFORMATION (Describe habitat, historic vs. current range, historic vs. current population estimates (# populations, #individuals/population), etc.):

The Xantus's murrelet (*Synthliboramphus hypoleucus*) is a small seabird of the Alcid family that occurs along the western coast of North America in the United States and Mexico. The Xantus's murrelet was formerly known as the Xantus' murrelet, *Endomychura hypoleuca* (Jehl and Bond 1975; American Ornithologists' Union 1982) and *Brachyramphus hypoleucus* (Howell 1917). The Alcidae family includes murres, guillemots, puffins, and the extinct great auk (*Pinguinus impennis*) (California Department of Fish and Game (CDFG) 2002).

The species is divided into two subspecies: *Synthliboramphus hypoleucus scrippsi* and *S. h. hypoleucus*. *Synthliboramphus hypoleucus scrippsi* breeds from the northern Channel Islands off the southern California coast south to the San Benito Islands in Mexico; *S. h. hypoleucus* breeds primarily at Guadalupe Island and the San Benito Islands off Baja California, Mexico (Drost and Lewis 1995). The subspecies are known to co-occur on some islands (e.g., San Benitos). On other islands, it is not clear which of the two subspecies are present, due to the difficulty in conducting surveys in the species' habitat. Because substantial declines have been documented in both subspecies, we are assigning candidate status to the species as a whole.

The subspecies differ in facial plumage, bill ornamentation, and range (Jehl and Bond 1975; Drost and Lewis 1995). *Synthliboramphus hypoleucus hypoleucus* has a bill that is approximately 8 percent longer than *S. h. scrippsi* and 5 percent thinner (Sibley 2000). . *Synthliboramphus hypoleucus hypoleucus* has white extending up in front of the eye, white above gape, broader white below the eye, and paler grayish group of feathers that cover the ear openings (Sibley 2000). According to Sibley, few intermediates have been recorded (Sibley 2000). *Synthliboramphus hypoleucus scrippsi* has a series of three to eight high-pitched peeping notes whereas *S. h. hypoleucus* has a rattle similar to the Craveri's murrelet (*Synthliboramphus craveri)* (Sibley 2000). Small numbers of *S. h. hypoleucus* have been recorded in the range of *S. h. scrippsi*, with at least one account of *S. h. hypoleucus* breeding in the range of *S. h. scrippsi* (Winnett et al. 1979).

Description

Xantus's murrelet is a black and white bird, 9 to 10 inches (23 to 25 centimeters) in length and weighs approximately 6 ounces (167 grams). Its legs are set far back on its body and wing beats are rapid and shallow (Murray et al. 1983; CDFG 2002). Xantus's murrelets fly with their heads held straight, close to the water (Griggs 1997). They have long, thin bills and are similar in appearance to the Craveri's murrelet. They are swift underwater, using their wings as flippers to propel themselves forward in a technique known as pursuit diving (CDFG 2002). Their plumage is black above and white below (CDFG 2002). Except upon careful inspection, winter plumage is not distinct from breeding plumage (Drost and Lewis 1995).

Distribution and Habitat

The Xantus's murrelet requires protected nest sites on offshore islands or associated rocks to breed (Pacific Seabird Group (PSG) 2002). Xantus's murrelets are known to nest on 12 islands scattered along the 500 miles (mi) (804 kilometers (km)) of Pacific coastline (CDFG 2002). In

the United States, *S. h. scrippsi* is known to breed on San Miguel Island and associated Prince Islet, Santa Cruz Island, Anacapa Island, Santa Barbara Island and associated Sutil Islet, and San Clemente Island (Carter et al. 1992; Drost and Lewis 1995). *Synthliboramphus hypoleucus hypoleucus* is known to breed at four locations off the coast of Baja California, Mexico: Islas Los Coronados, San Gerónimo Island, San Benito Islands, and Guadalupe Island (Drost and Lewis 1995; Carter et al. 1996 in Sydeman and Nur 2000; Keitt 2000).

Xantus's murrelets spend the majority of their lives at sea. Little is known about the species' wintering distribution. Post breeding and winter distribution has been recorded north from Washington and southern British Columbia (Drost and Lewis 1995; Whitworth et al. 2000) down to Baja California (Howell and Webb 1995). They have been observed and are thought to winter in the Southern California Bight as well as the warmer offshore waters of California, Oregon, Washington, and Baja California (Briggs et al. 1987; Drost and Lewis 1995). The largest numbers documented during the winter season have been from Point Conception to Monterey Bay and Point Año Nuevo (Briggs et al. 1987). The northern subspecies has been recorded from the Pacific Coast on islands from Islas Los Coronados to the San Benitos (Howell and Webb 1995).

Life History and Behavior

During the breeding season (February through June), adult Xantus's murrelets spend their days foraging and resting at sea, returning to the islands at night (CDFG 2002). This nocturnal behavior is thought to avoid predators such as gulls, owls, and falcons (Whitworth and Carter 2002). Xantus's murrelets feed on small fish and zooplankton, usually within 1.2 to 8.7 mi (2 to 14 km) of the colony island (del Hoyo, et al. 1996). They have been documented to live up to 15 years in the wild (Carter et al. 1992).

Breeding Behavior

Xantus's murrelets begin arriving within the vicinity of breeding sites in December and January (Murray et al. 1983; Gaston and Jones 1998). They usually return to the same island or nest site to breed each year, usually with the same mate (Murray et al. 1983). Some Xantus's murrelet pairs may nest every year in good years; marked birds have been found nesting for 3 and 4 consecutive years (Murray et al. 1983). During the breeding season (February-May), Xantus's murrelets occur in mixed groups of breeding and non-breeding individuals on the nearshore water adjacent to breeding colonies (Drost and Lewis 1995; Whitworth et al. 2000. The birds occur in loose aggregations and engage in vocal activities in near shore waters. They infrequently vocalize on shore (PSG 2002). Courtship and pair bonding activities occur during the day out at sea and nest site visits occur at night. Xantus's murrelets will visit nest sites as early as 2 months before egg-laying, but typically 2 to 3 weeks prior (Murray et al. 1983). Egg laying typically peaks from mid-March to mid-April but has been recorded as early as mid-February and as late as mid-June (Murray et al. 1983; Gaston and Jones 1998).

Nesting colonies are generally found on steep slopes or cliffs. Xantus's murrelets nest in natural rock crevices, caves, under shrubs, and occasionally under manmade structures or burrows created by other species (Drost and Lewis 1995). No additional material is added to the nest, and the site may be a shallow scrape if the ground is soft or else unmodified (Drost and Lewis 1995). Xantus's murrelets typically lay clutches of two eggs laid 8 days apart (Murray et al. 1983). Eggs are left unattended during the interval between laying of first and second eggs. The first egg is susceptible to predation by native deer mice or introduced rats when the egg is left

unattended as the female Xantus's murrelet forages, gathering more energy before she will lay the second egg (CDFG 2002; Channel Islands National Park (CINP) 2002). Compared with two closely related species, the Craveri's murrelet and the ancient murrelet (*Synthliboramphus antiquus*), productivity for the Xantus's murrelet is low. This low productivity is thought to be due to population growth constraints rather than a natural life history trait (CDFG 2002).

Adult Xantus's murrelets are only found onshore when they are incubating nests (CDFG 2002). Both the male and female take turns incubating the eggs. Due to the delay in incubation, the two eggs generally hatch around the same time, an average of 43 days after incubation began (Murray et al. 1983). Chicks hatch between early April and early July. They are born precocial (covered with down and fully active) (CDFG 2002). Juveniles leave their nests for the ocean within 2 to 3 days of hatching and remain at sea for an unknown amount of time (Murray et al. 1983). Chicks are encouraged to leave from the nest by their parents calling from the sea below. Chicks will make their way to the cliff edge and either jump or are blown into the surf below (Murray et al. 1983). After breeding, Xantus's murrelets rapidly disperse and are uncommon on or near the islands by mid-July (Murray et al. 1983). Juveniles are reared out at sea by their parents (CINP 2002). Juvenile Xantus's murrelets begin breeding typically at 4 years of age but can breed as early as 2 years of age (Drost and Lewis 1995).

Abundance

Xantus's murrelets appeared to be fairly abundant and were referred to as "common" in early accounts (Grinnell and Miller 1944; Howell 1917). Since the late 19th century, population estimates have indicated that populations have declined considerably (Drost and Lewis 1995; McChesney and Tershy 1998; PSG 2002). An estimated 10,000 to 15,000 individuals remain, with an estimated breeding population between 5,000 and 11,500 (Murray et al. 1983; Whitworth and Carter 2002; CDFG 2002; Carter et al. in press). One estimate assumes a population of 3,000 to 7,000 breeding birds in the Southern California Bight (Carter et al. in press). Population estimates vary, but seem to be in general agreement that a very small population remains. Estimates of the breeding and total populations are difficult to make due to the secretive nature of the murrelet's nesting colonies which are difficult to access, and their scattered and pelagic distribution at sea (PSG 2002).

Eighty percent of the world Xantus's murrelet population breeds at four locations: Santa Barbara Island, Islas Los Coronados, San Benito Island, and Guadalupe Island (CDFG 2002). Xantus's murrelets have experienced a population decline of 30 to 72 percent from 1977 to the mid-1990s on Santa Barbara Island, and the population has since declined to 30 percent or less of the mid-1990s estimate (Wolf et al. 2000). Nest site monitoring work on the Xantus's murrelet population of Santa Barbara Island revealed a decline in nest site occupancy rates since 1985 (Wolf et al. 2000; CDFG 2002). Santa Barbara Island supports 60 percent of the Xantus's murrelet nesting population in California, with 2,500 to 2,800 breeding birds (CDFG 2002). The distribution of the southern Xantus's murrelet subspecies appears to have been greatly reduced by extirpations on Natividad, San Roque, and Asuncion islands, leaving breeding populations only on the San Benitos Islands and Guadalupe Island (Keitt 2000).

Declining occupancy rates at nesting sites on Santa Barbara Island, coupled with low productivity have decreased the likelihood of survival of the Xantus's murrelet (CDFG 2002; PSG 2002). Average Xantus's murrelet productivity on Santa Barbara Island between 1983 and 1995 was 0.813 hatchlings per pair. Craveri's murrelets average 1 to 1.5 hatchlings per pair and

Ancient murrelets average 1.44 to 1.69 chicks per pair each year (Gaston and Jones 1998). If the trend of an annual 2.5-5.3 percent decline continues, numbers at this colony may reach a level at which the likelihood of survival is decreased and would eventually lead to the colony's extirpation (Sydeman et al. 1998). The extirpation of such a large breeding colony would increase the probability that the Xantus's murrelet would become extinct (PSG 2002).

Similarly, the population on Anacapa Island has been declining. A 56 percent decline of Xantus's murrelet nesting success was documented in the sea caves of Anacapa Island (McChesney et al. 2000). The main source for decline is rat predation (see predation section below).

Table 1: Most recent population estimations for the Xantus's murrelet on breeding islands

Island	Population estimate	Year	Subspecies
Santa Barbara[4]	7000	2001	*scrippsi*
Anacapa[5]	200-400	2002	*scrippsi*
Santa Cruz[1]	100-300	1995-1996	*scrippsi*
San Miguel[1]	50-300	1995-1996	*scrippsi*
Santa Catalina[1]	25-75	1995-1996	*scrippsi*
San Clemente[1]	10-50	1995-1996	*scrippsi*
Guadalupe–Islote Negro[3]	800 (300 non-breeding)	1968	subspecies not specified
Guadalupe–Islote Afuera[3]	4000 (1000 non-breeding)	1968	subspecies not specified
Los Coronados (3 islands)[2]	2-253 calls, 6 nests/ 500-1500(Norte), 1000-2000(Medio & Sur)	1999	subspecies not specified
Todos Santos[2]	0-56 calls, 0 nests (1 carcass found in 1996) /50-250	1999	subspecies not specified
San Martín[2]	0-10 calls, 0 nests/ 50-250	1999	subspecies not specified
San Gerónimo[2]	5 nests (most in town), 0-86 calls/ 100-500	1999	subspecies not specified
San Benitos (E, W, middle)[2]	17 nests, 0-82 calls 250-1000(E & W), 25-200 (middle)	1999	*hypoleucus* and *scrippsi*

scrippsi: Synthliboramphus hypoleucus scrippsi
hypoleucus: Synthliboramphus hypoleucus hypoleucus

[1] Carter et al. 1996
[2] Keitt 2000; Population estimates thought to be high (B. Keitt, pers. comm. 2003)

[3] Delong 1968
[4] CINP 2000
[5] Whitworth et al. 2002 *in* Darrell Whitworth, U.S. Geological Survey, pers. comm. 2003

THREATS
A. The present or threatened destruction, modification, or curtailment of its habitat or range.

Introduced Species
Introduced species have caused habitat degradation which has led to increased competition for suitable nesting sites, a decrease in such sites, and an increase in predation of Xantus's murrelet colonies on Anacapa Island, Santa Barbara Island, and at nearly all Mexican islands (Everett and Anderson 1991; Drost and Lewis 1995; McChesney and Tershy 1998; McChesney et al. 2000; Keitt 2000). Habitat modification as a result of livestock grazing, farming, and burning threatens the survival of the Xantus's murrelet. Sheep (*Ovis aries*), European rabbits (Leporidae), pigs (*Sus scrofa*), cattle (*Bos* sp.), and goats (*Capra hirca*) have heavily grazed native vegetation which has resulted in a loss of vegetative diversity (McChesney and Tershy 1998). Loss of shrub cover results in loss of suitable nesting sites (Ingram and Jory Carter 1997). Vegetated nest sites offer protection from heat and predators (Carter et al. 1992). Xantus's murrelets may expend excess energy attempting to find suitable alternative nest sites such as crevice sites, which are limited in number. It is possible that displaced birds may not breed at all (Carter et al. 1992). In addition to causing vegetative loss, rabbits may also compete for burrow and crevice nest sites (Moors and Atkinson 1984; McChesney and Tershy 1998).

Efforts have been undertaken on many islands to remove nonnative species. European hares were removed from East Anacapa Island sometime after 1965 (McChesney and Tershy 1998). The National Park Service and the U.S. Fish and Wildlife Service (Service) initiated a rabbit control program to rid Santa Barbara Island of European hares in 1954. The rabbit population on Santa Barbara Island was fully eradicated as a result of an accidental fire in 1959 (McChesney and Tershy 1998). Rabbits were removed from the Todos Santos Islands in 1998 (McChesney and Tershy 1998). Today, goats remain in large numbers on Guadalupe Island (McChesney and Tershy 1998). A few burros remain on Islas Los Coronados, the San Benitos Islands, and the Todos Santos Islands (Keitt 2000). Sheep and goats were removed from Natividad Island in 1997 (Keitt 2000). In 1998, the Island Conservation and Ecology Group removed large numbers of feral rabbits from West and Middle San Benitos Islands (Keitt 2000).

Although the nonnative herbivores have been absent from Santa Barbara Island since the late 1950s (Sumner 1958), their presence facilitated the introduction of nonnative grasses, which continue to exist and spread on the island. The conversion of native habitat to nonnative grassland that has occurred on Santa Barbara Island poses a threat to the population of Xantus's murrelet due to the fact that the island is only 1 square mile (2.6 square kilometers) in size and holds the majority of the nesting population in California. Introduction of nonnative grasses has modified the habitat. Such habitat modification is thought to have increased the endemic deer mouse (*Peromyscus maniculatus elusus*) population, a native predator of Xantus's murrelet eggs (Murray et al. 1983). In addition to the indirect effects caused by nonnative species, Xantus's murrelets can suffer direct impacts from crushing of burrows and young by grazing animals.

Human Disturbance

CINP is visited by many people each year. Approximately 30,000 people travel to the islands and waters, and an additional 60,000 people enter park waters without accessing land (CINP home page 2002). Increased human access heightens the risk of introduction of nonnative species and predators. Kayaking through sea caves could disrupt the Xantus's murrelets attempting to nest. However, the National Park Service has been working to reduce this threat by meeting with kayak guides to designate which caves should be avoided due to the presence of the Xantus's murrelet, educate them on what roosting habitat for the Xantus's murrelet looks like, and what distances should be maintained along cliff walls (Kate Faulkner, National Park Service, pers. comm. 2003). Some kayak guides have been educated by biologists and park rangers to stay away from caves where the birds are seen flying in with fish, which indicates the presence of a nest (Weiss 2002). According to the kayak guides, dry caves such as those occupied by the Xantus's murrelet generally do not attract people who kayak. They prefer wet caves which are defined as those that have water flowing in and out of them (K. Faulkner, pers. comm. 2003).

Fishing villages

Fishing villages on nesting islands in Mexico are another source of human disturbance, although effects to the Xantus's murrelet are not known (PSG 2002). Increased recreation and human disturbance heightens the risk of introducing species that can be fierce predators of the Xantus's murrelet such as rats and cats. San Benitos Islands, Todos Santos Islands, San Martin Island, San Gerònimo Island, and Natividad Island have fishing villages or camps (Keitt 2000).

Chronic oil pollution

Oil spills pose a potential threat to the survival of the Xantus's murrelet. Two of three major marine shipping traffic lanes in southern California are within 15.5 mi (25.0 km) of most U.S. Xantus's murrelet colonies, including the Santa Barbara Island population. The third marine shipping traffic lane occurs within 15.5 mi (25.0 km) of the largest Mexican Xantus's murrelet colony at Islas Los Coronados (Carter et al. in press). Some of the 35 offshore oil platforms are between 7.4 to 18.6 mi (12 to 30 km) from most U.S. Xantus's murrelet colonies and occur near foraging habitat (PSG 2002). An estimated 95 percent of the Southern California Bight population gathers on Santa Barbara Island during breeding season (Sydeman et al. 1998). An oil spill could lead to the extirpation of the U.S. breeding population or even extinction of the Xantus's murrelet, due to its limited distribution and tendency to aggregate during the breeding season (Drost and Lewis 1995; Carter et al. in press). Oil spills have been documented from offshore platforms, pipelines, tankers, and other military and commercial shipping (Anderson et al. 1993; Carter and Kuletz 1995; Carter et al. in press). Oil spills also result from unloading and loading cargo from onshore and offshore facilities, cleaning of tanks at sea, and bile pumping (Carter and Kuletz 1995).

There have been 347 oil spills in excess of 10,000 gallons (37, 850 liters) between 1960 and 1997 in California (Oil Spill Intelligence Report 1997). Oil spills between 1996 and 2002 in California have most commonly impacted Alcids (Oiled Wildlife Care Network, unpubl. data *in* PSG 2002). Xantus's murrelets are vulnerable to oil spills during the breeding and non-breeding season, both within and outside of California. Effects to small seabirds resulting from oil spills include death, reduction in numbers of breeding birds, reductions in breeding range, reduced breeding success, and the sublethal effects of oiling for birds that survived initial oil contamination, whether or not they have received rehabilitation (Carter and Kuletz 1995). Oil kills birds by direct contact through ingestion or coating of feathers, or indirectly through a decreased reproductive output (American Trader Trustee Council 2001). A few dead oiled

Xantus's murrelets have been reported on beaches in central California (Carter et al. in press). Dead or dying Xantus's murrelets are difficult to recover due to low onshore transport, prevailing winds and currents, and the fact that the oiled carcasses sink or are often scavenged (American Trader Trustee Council 2001; PSG 2002). The American Trader Trustee Council (2001) reported that "four out of five small bodied birds (i.e. the size of murrelets) were removed in a few hours by common ravens."

Winter oil spills and mystery spills (spills where the source of the oil is unclear) create the risk of oil contamination and mortality throughout the year. Because the California bight includes seismically active areas, there is an increased risk of oil spills (PSG 2002). Oil spills adversely affect fish populations (Carter and Kuletz 1995), which results in further limiting prey for the Xantus's murrelet and other seabirds.

Since 1977, offshore oil and gas activities have increased. Currently, there are 23 oil and gas platforms producing from 43 leases in Federal outer continental shelf waters offshore California. Companies have submitted requests for suspensions and schedules of activities for exploration and development of the remaining 36 undeveloped leases. Offshore oil drilling in California is expected to continue to decline slightly, due to a moratorium preventing the leasing of new drilling sites for at least ten years (Mark Pierson, Mineral Management Service, pers. comm. 2003). If all the activities proposed for the undeveloped units are pursued and approved by local, State, and Federal agencies, a number of activities are expected to occur during the next decade or so, diminishing the physical presence of the offshore oil industry (Service 2002). However, current production levels could be sustained for some time to come (Service 2002).

B. <u>Overutilization for commercial, recreational, scientific, or educational purposes</u>.
Not known to be a threat to this species.

C. Disease or predation.

Disease

Disease is not a known threat to this species. Parasites have been recovered from the digestive tract of adults including a cestode *Tetrabothrius* sp. and two nematodes, *Contracaecum* sp. and *Seuratia* sp. (Drost and Lewis 1995). However, nothing is known regarding the effects of these parasites. No ectoparasites, nest parasites, or commensals have been reported for the species (Drost and Lewis 1995).

Predation

Predation by nonnative predators is a source of decline for Xantus's murrelets. Seabird declines and extirpations have been caused by nonnative predators such as rats (*Rattus* sp.) and feral cats (*Felis catus*) (Moors and Atkinson 1984; Everett and Anderson 1991; Bertram 1995; Seto and Conant 1996; McChesney and Tershy 1998; Gaston and Jones 1998; Keitt 2000; Seto et al. 2001). Small seabirds are especially threatened by such predation due to their low annual productivity, small size, and lack of effective anti-predator behavior (Moors and Atkinson 1984).

Rats, cats, and dogs (*Canis familiarus*) are present on islands where Xantus's murrelets are known to breed. Rats and cats are thought to have been brought over to Baja California with seasonal or permanent fishing encampments (McChesney and Tershy 1998). It is believed that cats were left on the islands and became feral. Dogs occur on nine of the Northwestern Baja California Islands and have become feral on Guadalupe and Cedros Islands (McChesney and Tershy 1998). Dogs were documented in 1999 on the San Benitos Islands, Natividad Island, San Gerònimo Island, and Guadalupe Island (Keitt 2000). Dogs may prey on Xantus's murrelets directly as well as destroy burrows and nesting sites. As of 2001, rats were recorded to be on all of the Channel Islands except Santa Barbara Island (Whitworth and Carter 2002). Rats were found on San Miguel in the 1980s (McChesney and Tershy1998) and were present on Anacapa Island between the mid-1800s and early 1900s (McChesney and Tershy 1998).

Introduced rats prey primarily on Xantus's murrelet eggs and chicks, but are capable of killing adults (Moors and Atkinson 1984; McChesney and Tershy 1998). Rats have been reported to attack unattended as well as incubated eggs (Seto and Conant 1996). One report documented how rats efficiently killed ancient murrelets by attacking and wounding the nape region (Betram 1995).

More rat-predated eggs and adults were found in 2001 than in previous years on Anacapa Island and its sea caves (Whitworth and Carter 2002). Most, if not all, of the Xantus's murrelet eggs on Anacapa appeared to be rat-predated (Harry Carter, U.S. Geological Survey, pers. comm. 2003). Rat predation is inferred by inspecting egg fragments and the nesting site; large bite marks (as opposed to small bite marks, indicative of mice) and the presence of rat feces are typical signs of rat predation (H. Carter, pers. comm 2003). Xantus's murrelets have low reproductive rates and high nest site fidelity, making it difficult to see increases in nesting effort and reproductive success on Anacapa.

The use of rodenticides has resulted in the successful removal of rats from over 30 islands worldwide, which ranged in size from 24.7 to 8,154 acres (10 to 3,300 hectares (American Trader Trustee Council 2001). Rats were eradicated in 1994 from San Roque Island, Mexico,

and reports of rats from other Mexican islands (such as Todos Santos and San Martín Islands) may have been the endemic woodrat (*Neotoma* sp.), which poses little threat to Xantus's murrelets as it is a vegetarian species (McChesney and Tershy 1998).

As a part of the American Trader Oil Spill Restoration Plan, rat eradication efforts are being implemented on Anacapa Island (American Trader Trustee Council 2001). It is thought that, with the removal of the rats, the population of Xantus's murrelets will increase on Anacapa Island. Efforts to remove the rats in 2001 and 2002 appear to have been successful. Biologists will continue to monitor the absence/presence of rats, as well as nesting success of Xantus's murrelets at Anacapa Island, in order to determine the success of the eradication effort. Even if successful, it may take ten years to detect an increase in Xantus's murrelet numbers, given their nest site fidelity and their low reproductive rates (CDFG 2002). Radar-monitoring data collected so far in the early 2003 breeding season have shown increases in the numbers of Xantus's murrelets returning to the island; these numbers are some of the highest counts for the species ever recorded at the island (Hamer Environmental L.P. 2003).

Feral cats have been introduced onto several islands and are predators of Xantus's murrelets. By 1989-1990, Islas Los Coronados' colony of Xantus's murrelets was reduced to 10 percent of its potential due to cat predation (R. L. Pitman, National Marine Fisheries Service, in litt.). Cats have appeared to extirpate breeding colonies of Xantus's murrelets off Baja California (Drost and Lewis 1995). Cats were thought to be responsible for the low numbers and near extirpation of Xantus's murrelets on Santa Barbara Island in the late 1800s and early 1900s (Philbrick 1972). Several islands have initiated cat removal programs such as Natividad Island, Cerdros, San Roque, and Asunción islands (McChesney and Tershy 1998).

In 1998, cats were known to have occurred on 19 Mexican and U.S. islands and were still on at least 10 of the California Islands at that time (McChesney and Tershy 1998). Nesting populations of Xantus's murrelets have been extirpated by introduced cats on Islas San Todos Santos, Isla San Martín, and Isla San Gerónimo (Jehl and Bond 1975), as well as the main island of Isla Guadalupe (Green and Arnold 1939 *in* Drost and Lewis 1995). Guadalupe Island harbors cats but they are not known to occur on any offshore islets where most of the island seabirds now occur (McChesney and Tershy 1998). Cats occurred on the San Benitos islands but have not been present on these islands since 1992 (McChesney and Tershy 1998). Cats have also been removed from North Coronado Island, Isla San Gerónimo, Cedros, San Roque, Asunciòn and Natividad islands (McChesney and Tershy 1998; Keitt 2000). The National Park Service worked to remove all cats from Santa Barbara Island, with the last cat removed in 1978 (Murray et al. 1983). Cats were introduced on Anacapa Island in the 1930s, and the last cat died in 1975 or 1976 (Anderson et al. 1989 in McChesney and Tershy 1998).

Native predators are another limiting factor to Xantus's murrelet populations. Predator population levels have possibly increased as a result of ecosystem changes (i.e. plant communities). The increase in nonnative grasses is believed to have increased the endemic deer mouse population, a native predator of Xantus's murrelet eggs (Murray et al. 1983; Drost and Lewis 1995). During a 10-year study on Santa Barbara Island, deer mice consumed 42 percent of Xantus's murrelet eggs (Drost and Lewis 1995). Other native predators include barn owls (*Tyto alba*), western gulls (*Larus occidentalis*), island spotted skunks (*Spilogale gracilis amphiala*) and peregrine falcons (*Falco peregrinus*) (Murray et al. 1983; Drost and Lewis 1995; McChesney and Tershy 1998). The number of Xantus's murrelets killed by barn owls on Santa

Barbara Island has been found to depend on the availability of other prey such as deer mice (Drost and Lewis 1995). Western gulls occasionally take Xantus's murrelet chicks, mainly during the time that the chicks leave land and join their families at sea. Peregrine falcons may become an increasing threat due to their successful colonization of the Channel Islands. They had previously experienced a severe decline in the 1960s due to effects from DDT (Musitelli 2000). Now peregrine falcons are recolonizing islands along the west coast (Drost and Lewis 1995; CDFG 2002) and have the potential to prey upon small seabirds such as the Xantus's murrelet. Skunks are known to feed on bird eggs as well as chicks. The island fox (*Urocyon littoralis*) is another native predator, known to eat bird eggs. This predator is thought to limit the Xantus's murrelets' distribution (Sowls et al. 1980; Drost and Lewis 1995) in the United States, as Xantus's murrelets only breed in substantial numbers on islands without island fox populations (Anacapa and Santa Barbara).

D. <u>The inadequacy of existing regulatory mechanisms</u>.
The CDFG has made a finding to list the Xantus's murrelet as a threatened species under the California Endangered Species Act. The Commission will go through the regulatory process to complete the listing (CDFG 2004). At this time, the Xantus's murrelet is protected by State candidacy incidental take regulations. While in the State candidacy period, incidental take of Xantus's murrelets is lawful provided that it is a result of activities covered under the terms and conditions as specified in the Section 749.2 added to Title 14 of the California Code of Regulations (CDFG 2003).

The Xantus's murrelet is protected under the Migratory Bird Treaty Act of 1918 (MBTA). The MBTA protects migratory birds and their parts (including eggs, nests, and feathers). However, the MBTA provides no protection for the habitat of birds. Protections offered to the Xantus's murrelet by the MBTA have not been sufficient to arrest or reverse the decline on the species.

Under the World Conservation Union (IUCN), the Xantus's murrelet is listed as "near threatened" and is considering to uplist it as "vulnerable" (Sydeman and Nur 2000). The Xantus's murrelet is listed as threatened in Mexico under *Norma Oficial Mexcana* NOM-Ecol-059 (Keitt 2000).

The Service listed the Xantus's murrelet as a Category 2 candidate in November 1994 (59 FR 58983). A category 2 candidate refers to species for which the Service has information to indicate that proposing to list as threatened or endangered is appropriate, but for which persuasive data on the biological vulnerability and threat are not currently available to support a proposed rules. However, the Xantus's murrelet lost its candidate status when the category 2 designation was dropped in 1996 (61 FR 7596).

The Xantus's murrelet is included in the North American Commission for Environmental Cooperation. One of the Commission's initiatives is to conserve biodiversity across shared ecosystems by identifying priority species for conservation, recovery objectives, and potential collaborative actions. Recovery objectives and conservation actions for the Xantus's murrelet have yet to be defined (CDFG 2002).

Currently, the creation of Marine Protected Areas (MPAs) within the Channel Islands is being considered. The creation of MPAs would result in "no take" zones which would prohibit all or select fishery activities (CDFG 2002). The creation of MPAs around the Channel Islands would

potentially reduce threats to the Xantus's murrelet from human disturbance, artificial light pollution, and possibly fishery bycatch (CDFG 2002).

E. Other natural or manmade factors affecting its continued existence.

Artificial light pollution

Many nocturnal birds are attracted to the lights of commercial fishing vessels (Cherel et al. 1996). Xantus's murrelets and other seabirds become exhausted from continual attraction and fluttering near lights or collide with lighted vessels, the impact resulting in injury or death (Herbert 1970; Bower 2000). There have been several occurrences where lighted vessels along coastlines have created problems involving numerous seabirds colliding with vessels (Dick and Donaldson 1978). Several bird species have been caught due to such light attraction coupled with disorientation (Whitworth et al. 1997; Carter et al. in press). Chicks have been documented to separate from their parents due to vessel lights, often resulting in death as chicks are dependent on parents for survival (Gaston and Jones 1998).

A specific concern involves the high wattage lights used on squid boats (about 30,000 watts per boat) to attract squid to the surface. These boats operate in shallow waters close to Xantus's murrelet breeding colonies in the California Channel Islands (PSG 2002). Other vessels often fish simultaneously within the same area. As reported in the Pacific Seabird Group petition (2002), Channel Island Park staff have noticed increased predation on Xantus's murrelets by western gulls and barn owls as a result of lighting, particularly from squid boats, near breeding colonies. Gull activity and predation increases with lighted conditions (Keitt 1998). One report documents heavier predation of seabirds by western gulls on moonlit nights than on dark nights (Nelson 1989).

In addition to squid boats, another specific concern involves ChevronTexaco Corporation's recent proposal to build a liquefied natural gas receiving and regasification terminal approximately a third of a mile from Islas Los Coronados, Mexico. The proposed terminal would be a fixed 980-foot (299-meter) long concrete island with two regasification plants, storage tanks, a heliport and a dock that would receive about four LNG tankers each week. Approximately 1,200 employees would live and work aboard the structure (Lindquist 2003). Lighting and shipping activities associated with this proposed structure could disrupt courtship and breeding activities, and spills associated with liquefied natural gas receiving activities could contaminate Xantus's murrelets and the nearshore waters.

On moonlit nights, many nocturnal seabirds display highly reduced activity levels, which is thought to be due to increased predation levels (Manuwal 1974; Watanuki 1986; Nelson 1989; Ainley et al. 1990; Jones et al. 1990; Keitt 1998). On lit nights, there is a decrease in incubation and chick departures to sea. The CDFG (2002) reports that "it is reasonable to expect that successive nights of high artificial light levels on and around breeding colonies would disrupt the normal nesting activities of Xantus's murrelets, which could result in nest abandonment, increased mortality of eggs and/or chicks, and increased predation rates of adults that do not return during lighted conditions."

A 4-year study looking at night lighting in regards to moon phases and its effects on storm petrels indicated that light-induced mortality occurred during every month of the year, but clear

seasonal patterns linked with the breeding phenology of each species were apparent (Corre et al. 2002). Fledglings have a high rate of light-induced mortality (Corre et al. 2002).

The California Fish and Game Commission created measures requiring light shields and a limit of 30,000 watts per boat, made effective on May 31, 2000. The resulting affects or benefits are unknown (PSG 2002).

Prey decline

The reduction of Xantus's murrelet populations could be due to prey decline. Xantus's murrelets feed on larval and juvenile fish such as northern anchovies (*Engraulis mordax*) and rockfish (*Sebastes* sp.), zooplankton and sand lance/sandeels (*Ammodytes* sp.), and larval Pacific sauries (*Cololabis saira*) (del Hoyo et al. 1996; CDFG 2002). Declines in zooplankton and anchovies have been documented (Whitworth et al. 2000). Eggs are in greater danger of predation as parents leave the nest for longer periods of time to forage for scarce food supplies (CDFG 2002). Declines in prey may result in lowered reproductive success of seabirds (Sydeman et al. 1998, 2001). Food shortage has been directly related to a delay in reproduction for the Xantus's murrelet population on Santa Barbara Island (Hunt and Butler *in* Sydeman et al. 1998). Also, food shortage has been indirectly related to greater intervals between egg-laying and alteration in timing of incubation exchanges (Hunt et al. 1979 *in* Sydeman et al. 1998). Changes in oceanographic conditions such as large shifts in temperatures may affect Xantus's murrelet food supply (Roth and Sydeman 2000). More information on the subject of prey decline is needed.

Military activities

Weapons testing and training exercises routinely occur in the Sea Test Range off southern California, and operations on Naval Base San Clemente Island overlap with the Xantus's murrelets' foraging grounds (CDFG 2002). These activities are likely to be sources of disturbance for Xantus's murrelets using these areas. However, we have no direct information on the effects of these disturbances; more information on this subject is needed. The Department of the Navy's Integrated Natural Resources Management Plan for San Clemente Island will take into consideration possible effects to the Xantus's murrelet (CDFG 2002). As with all human activity, military personnel and activities increase the threat of introducing nonnative predators to Xantus's murrelet colonies. A Mexican Navy outpost is located on the Southern Isla Los Coronados and an active Navy garrison exists on Guadalupe Island (Keitt 2000).

Bycatch in fisheries

Threats to the Xantus' murrelet's survival include mortality via bycatch in fisheries (Drost and Lewis 1995; Carter et al. in press). In British Columbia, Xantus's murrelets have been reported as bycatch in various set and drift gill-nets (CDFG 2002; PSG 2002). No Xantus's murrelets have been documented as bycatch in California, but no observer program exists for these fisheries (CDFG 2002). Bycatch may have minor effects on Xantus's murrelet populations but combined with other factors, resulting impacts would add to their decline as a whole (CDFG 2002; PSG 2002). More information on this subject is needed.

BRIEF SUMMARY OF REASONS FOR REMOVAL OR LISTING PRIORITY CHANGE:

FOR PETITIONED SPECIES:

a. Is listing warranted? Yes

b. To date, has publication of a proposal to list been precluded by other higher priority listing actions? Yes
c. Is a proposal to list the species as threatened or endangered in preparation? No
d. If the answer to c. above is no, provide an explanation of why the action is precluded.

The Service received a petition to list Xantu's murrelet in April 2002 to list this species under the Endangered Species Act (Pacific Seabird Group 2002). We considered the petition in this assessment and incorporated information from the petition where appropriate. Since publication of the 2002 CNOR, the publication of a proposed rule to list this species has been precluded by other higher priority listing actions, and based on work scheduled we expect that will remain the case for the remainder of Fiscal Year 2004. Almost the entire national listing budget has been consumed by work on various listing actions taken to comply with court orders and court-approved settlement agreements, emergency listing, and essential litigation-related, administrative, and program management functions. We will continue to monitor the status of Xantu's murrelet as new information becomes available. This review will determine if a change in status is warranted, including the need to make prompt use of emergency listing procedures.

LAND OWNERSHIP (Estimate proportion Federal/state/local government/private, identify non-private owners):

Table 2: Land Ownership of Islands with known or historical Xantus's murrelet populations.

Island	**Ownership**
Santa Barbara	National Park Service
Anacapa	National Park Service
Santa Cruz	National Park Service
Santa Rosa	National Park Service
San Miguel	Owned by the Department of the Navy; managed by the National Parks Service
San Nicolas	Department of the Navy
San Clemente	Department of the Navy
Santa Catalina	Privately owned
Guadalupe	Mexican Government (Vizcaino Biosphere Reserve)
Los Coronados	Mexican Government (National Protected Areas Office)
Todos Santos	Mexican Government (National Protected Areas Office)
Cedros	Mexican Government (National Protected Areas Office)
Natividad	Mexican Government (Vizcaino Biosphere Reserve)

San Roque	Mexican Government (Vizcaino Biosphere Reserve) Vizcaino Biosphere Reserve
Asunción	Mexican Government (Vizcaino Biosphere Reserve)
The San Benitos	Mexican Government

PRELISTING (Describe status of conservation agreements or other conservation activities):

Channel Island National Park personnel, the USGS Biological Resources Division, University of California-Irvine, and Point Reyes Bird Observatory monitor the Santa Barbara Island population of Xantus's murrelets annually in early March (CINP Staff 2002).

The Pacific Seabird Group (PSG) formed the Xantus's murrelet technical committee, a group of biologists and resource managers, to synthesize available data on this species and to evaluate existing potential threats. The committee has met annually since 1992. PSG petitioned the Service to list the species as threatened under the U.S. Endangered Species Act (PSG 2002).

Listed as "vulnerable" by the World Conservation Union (IUCN; Hilton-Taylor 2000); a Species of Special Concern by the California Department of Fish and Game; a Migratory Nongame Bird of Management Concern by the Service; and a Conservation Priority Species by the Marine Species of Common Conservation Concern Initiative, North American Commission for Environmental Cooperation (CDFG 2002).

The California Fish and Game Commission has made a finding to list the Xantus's Murrelet as a threatened species under the California Endangered Species Act. The Commission must now go through the regulatory process to add it to the Threatened Species List. Until it is listed by the State, the Xantus's murrelet will be protected by candidacy incidental take regulations (CDFG 2004). These regulations and State protection includes both subspecies of the Xantus's murrelet: *S. h. scrippsi* and *S. h. hypoleucus*.

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LISTING PRIORITY (place * after number)

THREAT

Magnitude	Immediacy	Taxonomy	Priority
High	Imminent	Monotypic genus	1
		Species	2
		Subspecies/population	3
	Non-imminent	Monotypic genus	4
		Species	5*
		Subspecies/population	6
Moderate to Low	Imminent	Monotypic genus	7
		Species	8
		Subspecies/population	9
	Non-imminent	Monotypic genus	10
		Species	11
		Subspecies/population	12

Rationale for listing priority number:

Magnitude: Xantus's murrelet populations in the United States and Mexico have declined due to a wide variety of threats. Taken in sum, these threats have resulted in substantial declines of the largest known breeding populations and extirpations on three of the Mexican islands. Data from the largest breeding population in the United States indicated a dramatic decline (up to 70 percent); data from other islands are scarce but the documentation of known threats can be used to infer similar declines.

Imminence: Although the decline in Xantus's murrelet populations has been substantial, the largest threats are being addressed, and, to some degree, ameliorated in the United States. The efforts to remove rats on Anacapa Island should benefit the species. Although predation is a large contributor to the current low population numbers of the Xantus's murrelet, it does not pose as imminent a threat as it once did. As discussed in the threats section, cats and rats have been removed from many of the islands where they once occurred. Anacapa Island implemented a rat eradication program in 2001 which seems to have been successful in removing the nonnative predator of the Xantus's murrelet. Rats were eradicated in 1994 from San Roque Island (McChesney and Tershy 1998).

The Service has been working with the State, National Park Service, and NOAA-Fisheries to address the threats of light pollution and human disturbance. The CDFG

implemented regulations to require shielding and limit wattage of lights used by boats conducting nighttime fishing activities address this threat. Although these regulations do not remove the negative effects of this activity, they likely have resulted in somewhat of a reduction of the impacts.

Oil pollution poses a potential threat to the survival of the Xantus's murrelet population, but is not immediately responsible for the species' current low numbers. The offshore oil industry is expected to decline over the next decade. However, the threat of oil spills remains.

Native predators of Xantus's murrelets such as deer mice and various raptors do not typically threaten the species' survival unless other sources of threat weaken the population. However, due to the multiple threats which affect the Xantus's murrelet and reduce its numbers, the effects of native predation can further exacerbate the decline of the species.

1APPROVAL/CONCURRENCE: Lead Regions must obtain written concurrence from all other Regions within the range of the species before recommending changes to the candidate list, including listing priority changes; the Regional Director must approve all such recommendations. The Director must concur on all additions of species to the candidate list, annual retentions of candidates, removal of candidates, and listing priority changes.

Approve: Kenneth McDermond March 11, 2004
Acting Manager, Date
California/Nevada Operations
Fish and Wildlife Service

Concur: Steve Williams April 5, 2004
Director, Fish and Wildlife Service Date

Do not concur:_____
Director, Fish and Wildlife Service Date

Director's Remarks: _____

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Date of annual review:_____

Conducted by:_____

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Comments:_____
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(Rev. 8/02)