Petition to list the yellow-billed loon, *Gavia adamsii*, as an endangered or threatened species under the Endangered Species Act

March 30, 2004

NOTICE OF PETITION

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Petitioners Center for Biological Diversity ("CBD"), Natural Resource Defense Council (NRDC), Pacific Environment, Trustees for Alaska (Trustees), Kaira Club, Kronotsky Nature Preserve, Taiga Rangers, Wild Nature of Sakhalin, Interregional Public Charitable Organization of Far Eastern Resource Centers (ISAR), Kamchatka Branch of Pacific Institute of Geography, and the Kamchatka League of Independent Experts (KLIE), formally request that the United States Fish and Wildlife Service ("USFWS") list the yellow-billed loon (*Gavia adamsii*) as an endangered species under the federal Endangered Species Act 16 U.S.C. §§1531-1544 (hereinafter ESA). In the alternative, petitioners request that USFWS list the yellow-billed loon as a threatened species under the ESA. The petitioner also requests that Critical Habitat be designated concurrent with the listing, as required by 16 U.S.C. 1533(b)(6)(C) and pursuant to the Administrative Procedures Act (5 U.S.C. 553). This petition is filed under 5 U.S.C.§ 553(e) and 50 CFR part 424.14. The USFWS has jurisdiction over this petition. This petition sets in motion a specific process as defined by 50 CFR part 424.14 placing definite response requirements on the USFWS and very specific time constraints upon those responses.

Petitioners:

The Center for Biological Diversity (CBD) is a non-profit environmental organization dedicated to protecting endangered species and wild places of western North America and the Pacific through science, policy, education, and environmental law. CBD submits this petition on its own behalf and on behalf of its members and staff, with an interest in protecting the yellow-billed loon and its habitat.

The Natural Resources Defense Council is a national nonprofit organization with 550,000 members and a staff of lawyers, scientist and other environmental specialists. NRDC's mission is to safeguard the earth: its people, its plants and animals, and the natural systems on which all life depends**.**

Pacific Environment is a non-profit environmental organization whose mission is to protect the living environment of the Pacific Rim. Based in San Francisco, with staff in Russia, China, and Washington D.C., Pacific Environment achieves this mission by strengthening democracy, supporting grassroots activism, empowering local communities

and redefining international policies. Pacific Environment is particularly dedicated to promoting international efforts to protect rare and endangered species and to protect biodiversity. Pacific Environment is dedicated to promoting cooperative conservation efforts across international borders.

Trustees for Alaska (Trustees) is a public interest law firm whose mission is to protect Alaska's natural resources and environment. Founded in 1974 Trustees is a full-service environmental law firm offering free counsel to local and national environmental groups, Alaska Native villages, nonprofit organizations, community groups, hunters, anglers, and others with a stake in protecting Alaska's natural heritage. In addition to litigation, Trustees' services include legal and factual research, case development, public education, general counsel and strategic advice.

Kaira Club works to protect the environment and especially marine species in the remote region of Chukotka, Russia.

Kronotsky Nature Preserve is a Russian nature preserve dedicated to protecting biological diversity on the Kamchatka Peninsula. It manages Kronotsky Nature Preserve as well as South Kamchatsky State Natural Wildlife Refuge.

The Regional Public Organization TKK “Piligrim” supports tourism, regional studies, and ecology. The organization educates children and youth as a means to support these issues. Piligrim supports protection of biodiversity in Sakhalin as well as in other regions of the globe.

Taiga Rangers is involved in protecting forests of the Russian Far East, including protected natural territories. Taiga Rangers also works to protect marine biodiversity and the seas of the Russian Far East and supports environmental education.

The Kamchatka Branch of the Pacific Institute of Geography of the Far Eastern Branch of the Russian Academy of Sciences (formerly the Kamchatka Institute of Ecology and Natural Resource Use) was created in 1991 from laboratories and institute departments of the Russian Academy of Sciences that were based in Petropavlovsk-Kamchatsky. The Institute’s goal is to study structural mechanisms for the development of terrestrial and aquatic ecosystems and to develop mechanisms and theories for sustainable natural resource use in the natural ecosystems that create the Kamchatka peninsula and the nearby portions of the northwestern part of the Pacific Ocean.

The Kamchatka League of Independent Experts (KLIE) is an environmental organization that helps to form ecological awareness to create conditions for achieving harmony between nature and humans on Kamchatka. KLIE’s programs include its program “Expert,” which is to develop public environmental impact reviews and involves promoting independent, trustworthy scientific research; a program on public participation to encourage active citizen’s activity to promote a safe environment and sustainable development; and “The Sea is Alive – We are Alive,” in which KLIE participates in the

Living Seas campaign, monitors Total Allowable Catch issues, and advocates against offshore oil and gas development in the seas of Kamchatka.

Wild Nature of Sakhalin was created in the end of 2002 with the goal of studying, conserving, and managing wilderness in Sakhalin Region in a sustainable manner. The organization focuses on the protection of trans-boundary species.

Acknowledgements:
Corrie Bosman at the Center for Biological Diversity prepared this petition. Portions of the petition are excerpted with permission of the author from: *Fair, J. 2002. Status and significance of yellow-billed loon (Gavia adamsii) populations in Alaska. Report to The Wilderness Society and Trustees for Alaska, Anchorage, AK.* For this reason, direct citation to this report is limited to circumstances where it is important for the reader to understand the source of the information. This is particularly true in situations where personal communications between Mr. Fair and others are noted. These personal communications were made in the course of interviews conducted with other biologists while collecting information and data for the Status Report.

The petitioners felt comfortable relying on this information as Mr. Fair has extensive experience working with loons. Mr. Fair has studied common loons for 26 years, directed the New Hampshire statewide loon recovery effort for 11 of those years, specialized in loon productivity and conservation, and worked as an independent consulting biologist writing loon population and productivity survey reports and management plans for hydroelectric reservoirs to satisfy federal licensing requirements. In addition, since moving to Alaska, Mr. Fair has summarized 13 years of loon data collected by Alaska Loon Watch, participated in the Alaska Loon Working Group and was a part of the 2002 and 2003 field research project that outfitted 12 yellow-billed loons with satellite transmitters to discover for the first time where the Western Arctic birds spend the winter.

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I. EXECUTIVE SUMMARY

The yellow-billed loon (*Gavia adamsii*) is the least profiled and studied of the 5 loon species occurring in Alaska and elsewhere in the world. It comprises only 3% of the Alaskan loon population index and has the lowest worldwide population of all loon species (Fair 2002). Like its closest relative, the common loon (*G. immer*), the yellow-billed loon eats primarily fish and is adapted to an aquatic existence. While often erroneously lumped with waterfowl species, the yellow-billed loon is generally longer-lived and exhibits a lower annual productivity rate. Productivity is variable due in part to a nesting phenology closely restricted by short open-water seasons on the northern breeding grounds. It is considered particularly vulnerable to changes in habitat including human disturbance and development.

The yellow-billed loon is a thinly distributed holarctic breeder on freshwater tundra wetlands. Yellow-billed loons currently breed or recently have bred in extreme northern Norway and Finland, arctic Eurasia to the Bering Sea, areas of Alaska's Seward Peninsula and arctic coastal plain, and areas of northwestern Canada west of Hudson Bay and Baffin Island. Within breeding ranges, yellow-billed loon density is low, variable, and sporadic. Yellow-billed loons over-winter predominantly on near-shore marine waters, selecting for protected embayments and archipelagos, at 50º - 61º N. Yellow-billed loons generally are thought to migrate along coastal routes next to Alaska, Canada and USSR, but evidence also suggests overland routes.

The USGS, the Alaska Region FWS, the Alaska Bureau of Land Management, and Alaska Audubon recognize the yellow-billed loon as a species of concern. As of yet, the species has no special protection or conservation plans, nor is it a candidate species for the ESA. The species is only protected under the Migratory Bird Treaty Act, which fails to provide substantial protections.

Threats to the yellow-billed loon include but are not limited to: oil and gas development, human disturbance, increased predation, small population size and low productivity, marine health, incidental by-catch from fishing, hunting, and the inadequacy of existing regulatory mechanisms.

Critical breeding habitat for this species is threatened from potential destruction, modification and fragmentation from oil, gas and other development. Oil exploration, drilling, and pipeline development could potentially affect a significant portion of a population, already small and under heavy environmental pressures. An oil spill could affect loons on nesting and brood rearing lakes and ponds, on rivers and streams, and in the marine environment. Such spills may directly injure or kill birds or indirectly impact birds by contaminating nearby tundra ponds, causing significant damage to the ponds and the birds that use them.

Given that yellow-billed loons spend approximately eight months each year exclusively in the marine environment this species may be highly vulnerable to marine contaminants

and toxics. Because this species tends to prefer near-shore areas including protected bays and archipelagos, it is more likely to come into contact with marine pollution.

Yellow-billed loons are highly vulnerable to environmental change and disturbance and exhibit a lower annual productivity rate than most waterfowl. In fact, all species of loons exhibit low productivity rates and slow re-colonization of breeding habitat, both factors which may limit population growth (or recovery).

Thus far, no state, federal, or international laws or programs are in place that are adequate to address the threats currently faced by the yellow-billed loon. Even though numerous agencies and conservation groups recognize the yellow-billed loon as a species of concern, none of these classifications provides any legal protection for the species, and no other regulatory mechanisms are in place to protect the yellow-billed loon.

The USFWS has two options for listing the yellow-billed loon under the ESA: (1) Endangered or Threatened throughout its entire range in the U.S., Canada, and Eurasia or (2) Endangered or Threatened as a Distinct Vertebrate Population Segment (DPS). Petitioners advise protection for this species is best provided by a listing of the global population as threatened or endangered under the ESA thereby protecting the yellow-billed loon throughout its entire range. Because the breeding population found in Alaska is a dynamic group that migrates and over-winters in various marine environments, and because this species is facing threats throughout its range, protection will only be truly effective if it's on a range-wide scale.

The yellow-billed loon faces a high risk of extinction because of its small population size, certain natural history characteristics, reproductive isolation, threats from industrial facilities and other pending development, and a lack of protective regulatory mechanisms. As this petition will demonstrate, the yellow-billed loon meets the listing criteria of the ESA. Petitioners recommend designating critical habitat concurrent with ESA listing. The added layer of protection provided by critical habitat will allow the FWS to designate reasonable and prudent alternatives to activities that are impeding recovery, but not necessarily causing immediate jeopardy to the continued survival of the species. This is particularly important as oil and gas development continues to expand across this species' prime U.S. breeding range.

II. INTRODUCTION

Population numbers of the yellow-billed loon are alarmingly low. Alaska's coastal plain has an estimated population of 3,000 yellow-billed loons (Fair 2002). Western Alaska has an estimated population of 650 individuals making the range-wide population in Alaska approximately 3,650 individuals (Id.).

An estimated 8,000 yellow-billed loons are speculated to occur in Canada with an additional 5,000 individuals thought to occur in Eurasia (Id.). With a global population estimated as low as 16,650 individuals, the yellow-billed loon is one of the most rare species of waterbirds that breed regularly within mainland North America (Id.).

Although more research is needed on the yellow-billed loon in its entire range, current scientific data demonstrate its low population numbers in Alaska and suggest its susceptibility worldwide. Knowledge of the species' ecology also demonstrates its vulnerability to environmental degradation and low population densities. This petition will describe in detail the natural history of the yellow-billed loon and its current population and conservation status. Petitioners will then go on to substantiate that the yellow-billed loon is eligible for listing on the ESA and merits Endangered or Threatened status with a concurrent designation of critical habitat.

III. NATURAL HISTROY

A. INTRODUCTION

Of the five loon species that nest in Alaska, the yellow-billed loon (*Gavia adamsii*) on average occupies the farthest northern breeding grounds, comprises 3% of the Alaskan loon population index (Groves et al. 1996), and represents the loon species with the lowest worldwide population and subject to the highest natural environmental stresses (Barr 1997, North 1994).

The yellow-billed loon is the most rare and the least studied of the five loon species. Like other loons, it eats primarily fish and appears to be mostly a visual predator. Adaptations for diving and prey pursuit (heavy bones, extreme posterior emergence of legs) greatly limit its terrestrial locomotion. The yellow-billed loon rarely goes ashore except to copulate, nest-build and incubate, brood, and to defecate; all these activities usually occur along the shoreline. Taking off to fly, and landing, must occur on water. Flight is fast and strong with rapid wing beats, and probably comparable to that of common loons.

The yellow-billed loon may be the most timid of all loons, reacting to human disturbance up to 1 mile distant (Earnst pers. comm. with J. Fair, Ted Swem, USFWS, pers. comm. with J. Fair), and is recognized as vulnerable to human disturbance and changes in its environment (Barr 1997, North 1994).

1. Species Description

The yellow-billed loon is a large, heavy-bodied water bird. Weights range approximately 4000 – 6000 g., and lengths 774 – 920 mm. (North 1994). Males are larger on average than females, but some overlap occurs. Feet are gray, large, powerful, and emerge far posterior. Foot placement and heavy body with nonpneumatic bones (North 1994) facilitates diving and foraging, but renders terrestrial locomotion ungainly at best.

Best distinguishing field mark of the yellow-billed loon is the shape and color (bright yellow in summer, pallid yellow or ivory in winter) of the bill. The distal culmen is less decurved than that of the common loon; remainder of the culmen is slightly recurved or nearly straight. Tomia and lower mandible are recurved (Binford and Remsen 1974). In winter, both species exhibit a gray-brown over white plumage, but are separable by faded bill colors, bill shape, and auricular patch (Palmer 1962, North 1994).

Plumage is very similar to that of common loons; males and females are similar. In summer, adults are white below and black above with extensive white spotting. Heads and necks are black with a white anterior throat band of vertical white stripes and a lower full "necklace" of vertical white stripes, and a white breast. The yellow-billed loon has fewer, broader strings in throat patch and necklace, and larger white spots on back and wings.

When hatched, chicks have very dark brown down with some white below, and become lighter by three weeks of age. By about ten weeks, juvenile plumage appears grayish-brown over white, similar to adult winter plumage. Breeding plumage likely appears at age three or older (Palmer 1962, North 1994), but breeding likely post-dates that by > 1 year (North 1994).

B. SYSTEMATICS

Order: Gaviiformes Family: Gaviidae Genus & Species: *Gavia adamsii*

The yellow-billed loon is one of five species in its genus, family, and order. It was formerly considered a subspecies of the common loon (*Gavia immer*) (Dementev and Gladkow 1967, Sjölander and Ågren 1976, Portenko 1981), but now is considered a superspecies with the common loon (AOU 1998).

1. Related Species

The yellow-billed loon is most closely related to the common loon, with which it forms a superspecies. Size, plumage, natural history, and vocalizations are similar to those of the common loon, though breeding habitat is different.

Pacific (*G. pacifica*) and arctic loons (*G. arctica*) are somewhat smaller and occupy ranges that reach further south but extend northward into the yellow-billed loon's range. Smaller yet, the red-throated loon (*G. stellata*) is most different from the other four loon species; its range also is sympatric with the yellow-billed loon but extends further south. Some calls of the Pacific and arctic loons are comparable to those of the common and yellow-billed loons; vocalizations of the red-throated loon differ markedly.

C. COMMON NAME

The yellow-billed loon is also known as the white-billed diver in Eurasia, *Tuullik* by Alaskan Inupiat (Geoff Carroll, ADF&G, pers. comm. with J. Fair), and sometimes king loon in various Alaskan villages. Its Chukchian name translates as "walrus-toothed loon" (Portenko 1981).

D. DIET

The yellow-billed loon is an obligate piscivore, known from limited anecdotal information to consume sculpins (*Myoxocephalus* sp., *Cottus scorpius*, and *Leptocottus armatus*), Pacific tomcod (*Microgadus proximus*), rock cod (*Sebastodes* sp.), Pacific sanddabs (*Citharichthys sordidus*), salmon (Salmonidae), nine-spine sticklebacks (*Pungitius pungitius*), Alaska blackfish (*Dallia pectoralis*), amphipods, isopods, gastropods, shrimps, hermit crabs, aquatic insects, spiders, and marine worms (summarized by North 1994).

E. FORAGING

On the breeding grounds, loons are probably opportunistic foragers (Barr 1997). Foraging is most common in deep, open water (North 1994) but adults foraging with chicks may utilize shallows, probing the bottom with their bills. Yellow-billed loons use visual detection of prey, often submersing bill and eyes while afloat to peer for prey. Prey is pursued underwater using primarily the feet for propulsion. Dives average 47 seconds and may involve under-ice portions of lakes in spring and fall (North 1994).

F. VOCALIZATION

Vocalizations include several calls similar to those of the common loon, though approximately ½ octave lower and often expressed more slowly (Sjölander and Ågren 1976). North (1994) described the Low Call used among close family members; the Moan; the Wail, howl-like call used to locate family members; the Tremolo (laughter) expressing surprise or alarm, and the Yodel, most complex of the calls, uttered by males for territorial proclamation. Variations occur in the more complex calls. Vocalizations are important to dispersal, nesting ecology, and survivability.

G. REPRODUCTION

Like the common loon (*G. immer*), which it closely resembles, the yellow-billed loon is believed to be primarily monogamous and to exhibit high territorial fidelity to nesting lakes. Each breeding pair protects a territory that may consist of 1 or more ponds or parts of several ponds (North 1994). The yellow-billed loon appears to be extremely vigilant against, and susceptible to, disturbance during incubation and chick rearing.

Clutch size is usually 2 eggs, average brood size 1.0-1.4 (e.g., North 1994, North and Ryan 1988, King 1979a), and only 1 brood per season is produced. Nest building begins mid-June; incubation lasts approximately 28 days (Sjölander and Ågren 1976). On the arctic coastal plain of Alaska, hatch generally occurs from July 11-28. Significant parental care is required to raise chicks. The period to fledging is unreported but > 5 weeks (North 1994). Complete juvenile molt in common loons requires 8-10 weeks (Palmer 1962) and yellow-billed loons are quite similar.

Juvenile yellow-billed loons mature in marine environments, may gain breeding plumage by their third summer, and probably require > 1 year thereafter to become breeders (North 1994).

H. RANGE AND DISTRIBUTION

1. Summer

The yellow-billed loon is a thinly distributed holarctic breeder on freshwater tundra wetlands (Barr 1997). Its breeding and coastal marine winter distributions are best described and mapped by Barr (1997), North (1994, 1993), McIntyre (1991), and North and Ryan (1986). Of these, McIntyre's (1991) map of worldwide breeding range is generally more conservative and reflective of recent literature referenced in this petition (Figure 1).

Figure 1: Worldwide breeding range of the yellow-billed loon.

Breeding grounds lie above 60º N (North 1994) although usually above 66º N (Stepanyan 1990, Kessel 1989). Yellow-billed loons currently breed or recently have bred in extreme northern Norway and Finland, arctic Eurasia to the Bering Sea, areas of Alaska's Seward Peninsula and arctic coastal plain, and areas of northwestern Canada west of Hudson Bay and Baffin Island (Barr 1997, North 1994, 1993, Knystautas 1993, Rogacheva 1992, Sibley and Monroe 1990, Kessel 1989, Godfrey 1986, North and Ryan 1986, Portenko 1981, Dementev and Gladkow 1967). Within breeding ranges, yellow-billed loon density is low, variable, and sporadic in Alaska (North and Ryan 1986), rare across the loon's breeding range, with distribution "extremely uneven" in Russia

(Knystautas 1993, Rogacheva 1992, Perfilev 1987), and rare in dispersed areas in arctic Canada, Alaska, and Eurasia (North 1994, 1993). McIntyre (1991) suspected that worldwide breeding distribution may be more restricted than recent range maps would indicate. Occasional areas of concentration have been noted, but remain impossible to predict by habitat type (Earnst 2000b, McIntyre 1991).

Figure 2: Distribution of yellow-billed loon in North America.

Derksen et al. (1981) and Lehnhausen and Quinlin (1981 in McIntyre 1991) reported habitats within the NPR-A in which yellow-billed loons were expected but did not in fact occur. Based on habitat parameters (lake size and distribution), North (1993) expected a concentration of breeding yellow-billed loons on the lakes of the Kotzebue lowlands in Selawik National Wildlife Refuge adjacent to the Seward Peninsula, and near Kivalina, but Platte (1999) reports only 2 observations of the species during 2 years of an expanded breeding pair survey for waterfowl in the area in early and mid June when most loons had arrived. Hundreds of individuals of other loon species were observed during the same survey.

Yellow-billed loon breeding distribution throughout its range is generally of low density and uneven, with a few localized areas or "pockets" of notably higher concentrations of pairs (e.g., Barr 1997, King and Brackney 1997, North 1994, McIntyre 1991, Rogacheva 1992, Stepanyan 1990, Flint et al. 1984, Sjölander and Ågren 1976). Areas of concentrations of breeding pairs have been identified in Alaska, Canada, and Russia, and while the uneven and spotty mosaic of distribution appears to be similar throughout the range of yellow-billed loons, precision of location of concentrations is known best in Alaska, where regular and more intensive waterfowl surveys and on the ground research are employed. Areas of concentration are reported in more general terms for Canada and Russia, where intensive surveys are lacking.

a. Alaska

In Alaska (Figure 2), the yellow-billed loon is a "sparse breeder" on St. Lawrence Island (North 1994, Palmer 1962). Portenko (1981) reported that the species nests and is not rare on St. Lawrence Island. On the Seward Peninsula, the yellow-billed loon was reported "fairly common" 1966-1974 (Kessel 1989) and "broadly distributed" (McIntyre 1991) in the north-central lakes region of the peninsula, and a rare breeder along coastal wetlands from Cape Prince of Wales to Cape Espenberg (Larned et al. 1992, Kessel 1989, Platte pers. comm. with J. Fair with J. Fair). Yellow-billed loons are extremely rare and irregular from Cape Espenberg north to Point Hope and in the Selawik and Noatak lowlands (Larned et al. 1992, North and Ryan 1986, Johnson et al. 1975, Platte pers. comm. with J. Fair with J. Fair). Some breeding appears to center around the wetlands south of Wainwright and north to Point Franklin (King and Brackney 1997, Larned unpubl. data, Mallek pers. comm. with J. Fair with J. Fair), but otherwise appears very scarce on coastal wetlands from Point Hope to Barrow. Most yellow-billed loon nesting in Alaska is found east of Pt. Barrow in the lake-district west of the Colville River (King and Brackney 1997, North 1994, North and Ryan 1986, Larned unpubl. data 1993-1999, Mallek pers. comm. with J. Fair), i.e., within the NPR-A.
Yellow-billed loons breed inland and close to coastal areas between Barrow and the Colville River, e.g., the Alaktak and Chipp River areas (McIntyre 1991, North and Ryan 1986, Sjölander and Ågren 1976), Singiluk (Derksen et al. 1979), near Teshekpuk Lake (North and Ryan 1986, Derksen et al. 1979), Square Lake (Derksen et al. 1981), the Killik River valley, (North and Ryan 1986), and on the Colville River Delta (Earnst 2000a, North 1994, North and Ryan 1986, etc.). In Alaska, concentrations of breeding pairs in recent years were found only on the Colville River Delta (Earnst 2000b, North 1994, 1983) and within NPR-A, south and west of Teshekpuk Lake and east of Atqasak

in the Meade River and Ikpikpuk River areas (Larned et al. 1999, King and Brackney 1997, Larned and Balogh 1997, Larned unpubl. data, Mallek pers. comm. with J. Fair).

No nesting has been reported within 110 km. of the Arctic Ocean between the Colville and Canning Rivers (North and Ryan 1986). The Arctic Refuge is virtually devoid of nesting yellow-billed loons. None are known to nest on the coastal plain of the Arctic Refuge (Garner and Reynolds 1986, Moitoret et al. 1985, Spindler et al. 1984, Garner 1982). There apparently are no reports of breeding on inland foothill lakes in the Arctic Refuge, although Garner (1982) originally listed the yellow-billed loon as a rare breeder on the inner coastal plain of the Arctic Refuge. Sage (1971) and McIntyre (1991) found yellow-billed loon occupation and assumed breeding on 2 lakes in the Sagavanirktok-Atigun River area including 1 pair in the Ribdon River valley, both adjacent to the western apex of the refuge.

The Colville River Delta yellow-billed loon population has been surveyed and intensively studied on the ground 1983-1984 (North 1986), 1989 (North 1993, McIntyre 1991), 1992-1999 (Johnson et al. 1999, 1998, 1997, 1996, Smith et al. 1994, 1993) and 1995-1999 (Earnst 2000a, 1998, pers. comm. with J. Fair). Maximum numbers of yellow-billed loons found there were low: 26 pairs in 1989 (McIntyre 1991) and 23 nests in 1998 (Johnson et al. 1998). Earnst (pers. comm. with J. Fair) reported 70 nests over five years on 30 different territories there in 1995-1999. North reported a minimum of 34 pairs and an estimated total of 46 pairs (North 1993).

Concentrations in NPR-A were mapped during FWS breeding waterfowl aerial surveys. King and Brackney (unpubl. data via Mallek pers. comm. with J. Fair) found several very small areas with >1 yellow-billed loons sq. km., primarily in a strip southwest from Smith Bay to the southern edge of the plain, and secondarily due south from the west end of Teshekpuk Lake. BLM (1998) used FWS (King's and Brackney's) data to show 7 small areas of > 0.57 yellow-billed loons/sq. km. within the NE NPR-A. Four of these 7 correspond to the secondary strip of concentrations described above. Derksen et al. (1977) observed yellow-billed loons at Teshekpuk Lake and around the Meade River area in NPR-A, but recorded no nests or broods at their study sites. Johnson et al. (1999) found only 2 yellow-billed loon nests in 1 of 4 lease blocks 7-30 km. west of Nuiqsut in the NE NPR-A (a 4.6 million-acre area comprising the northeast section of the Reserve).

b. Canada

Summer range and distribution of breeding pairs of yellow-billed loons in Canada are discussed most thoroughly by Barr (1997), though many of his literature sources are >10 years old. North's (1994) map of distribution (Figure 2) may be more meaningful in the consideration of regional breeding populations. Mainland summer range in Canada generally includes all tundra above tree line, and breeding grounds are generally a nonperimeter subset of that area. Palmer (1962) suggested that breeding pairs might be found southward to tree line, but Barr (1997) judged that the lower areas were places of casual occurrence at best.

Breeding occurs on the barren grounds east of the Mackenzie Delta (Johnson et al. 1975) and from the Bathurst Peninsula east to the Melville Peninsula and Hudson Bay and south to the Thelon River drainage and nearly to the northeast bays of Great Slave Lake. Yellow-billed loons also breed on Banks, southern and western Victoria, Prince of Wales, King William, Somerset and Boothia Islands, but only common loons breed on Baffin Island (Barr 1997, North 1994, 1993, Johnson and Herter 1989, Johnson et al. 1975).

Concentrations of yellow-billed loons in Canada during the breeding season were summarized by Barr (1997) on Banks Island, on Victoria Island in 3 specific, localized areas described in earlier literature and in particular on Prince Albert Peninsula (Cornish and Dickson 1996), the mainland south of Kent Island and east of Bathurst Inlet to the upper reaches of the Ellis River, and the west side of the Boothia Peninsula. North (1993, pers. comm. with J. Fair) believed mainland breeding grounds to be generally centered in the area of the Thelon Game Sanctuary. Based on a summary of migratory concentrations in these areas, Barr (1997) suggested mainland-breeding centers south of Amundsen and Coronation Gulfs.

No confirmed reports exist of breeding yellow-billed loons in the Yukon (Salter et al. 1980, Sinclair pers. comm. with J. Fair), on the Mackenzie Delta, or on Tuktoyaktuk Peninsula (summarized in Barr 1997).

c. Eurasia

Soviet/Russian data and reports are the most incomplete due to lack of studies, undependable international communications and unavailability of records. Summer range and actual breeding distribution are difficult to define due to the uncertain definition and timing of surveys. The preponderance of Eurasian (Palearctic) breeding yellow-billed loons occur in tundra areas, but not polar zones, above 66º N between the Yamal and Chukchi Peninsulas, including tundra but not polar islands (Barr 1997, North 1994, Knystautas 1993, Rogacheva 1992, Sibley and Monroe 1990, Flint et al. 1984, Portenko 1981). Rogacheva (1992), Stepanyan (1990), Perfilev (1987), Portenko (1981) and others indicate the numbers of yellow-billed loons are rare throughout Russian summer range, with concentrations in only a few areas, and indicate that the distribution is spotty as well.

On the Chukchi Peninsula, Portenko (1981) found yellow-billed loons breeding in some areas, but are absent or rare in the interior and along the southern coast. Pearce et al. (1998) found low numbers of yellow-billed loons along the north coast of the Chukchi Sea from the Kolyma River Delta eastward through the eastern Chukchi, but none west of the Kolyma through the Lena Delta. Portenko (1981) considered the yellow-billed loon a rare visitor to Wrangel Island (i.e., no breeding). Breeding distributions of yellow-billed loons in Russia may be much more restricted than portrayed by western biologists, e.g., McIntyre (1991: 150; Figure 1). Kondratiev (1989: 38; Figure 3), corroborated by data from Pearce et al. (1998) and Hodges and Eldridge (1996, 1995, 1994), for example, indicates a dramatically smaller distribution on the Chukchi Peninsula than does McIntyre (1991).

Eurasian concentrations are reported only on the Chukchi and Taimyr Peninsulas of Russia (Knystautas 1993, Kondratiev 1989, Flint et al. 1984). Rogacheva (1992) reported the species rare throughout the Taimyr area, its total number low, and breeding confined to the peninsular area of the much larger Krasnoyarsk Territory. North (1994) referred to the incidence of yellow-billed loon breeding in the 2 areas as "common," likely in reference to much lower densities elsewhere, and not common in reference to waterfowl densities.

Figure 3: Distribution of the yellow-billed loon in the Soviet Far East.

Very small numbers of yellow-billed loons have been reported to breed in extreme northern Finland, the Varanger Fjord area of Norway, and the adjacent Kola Peninsula of Russia, and on Kolguyev Island and the southern island of Novaya Zemlya (North 1994, Sibley and Monroe 1990, North and Ryan 1986).

2. Wintering Range

Yellow-billed loons overwinter predominantly on nearshore marine waters, selecting for protected embayments and archipelagos, at 50º - 61º North from Puget Sound to Kodiak Island to and irregularly south to Baja California, and off Norway and from the Kamchatka Peninsula south to northern Japan, Korea and China (North 1994, Barr 1997). Immatures of 1-3 years are believed to live year-round in wintering areas.

3. Migration

Yellow-billed loons generally are thought to migrate along the coasts of Alaska, Canada, and USSR (Barr 1997, Godfrey 1986, North and Ryan 1986, Palmer 1962). Evidence also suggests an overland route through Anaktuvuk Pass (Irving 1960), and Godfrey (1986) and Palmer (1962) suggested overland routes to central Canada. Recent work by Kamchatka ornithologists, has demonstrated that the yellow-billed loon migrates along the marine shores of Kamchatka (Artyukhin pers. comm.). North (1994, 1993) postulated that yellow-billed loons wintering in Alaskan waters migrate overland directly to Canadian breeding grounds, and that Alaskan and arctic Canadian breeding populations winter off the coasts of Japan and Siberia. This hypothesis is discussed in more detail in the section of this petition discussing ecological discreteness. Barr (1997) questioned the likelihood of an overland Canadian route because numerous migration studies and surveys in the area have failed to find large numbers of yellow-billed loons, but noted that there is "increasing evidence of alternative migration routes and complex relationships between Nearctic and Palearctic populations."

Yellow-billed loons migrate into the North Slope area of Alaska from mid to late May, and generally leave late August-mid September, although there are records of loons remaining into late October (Sage 1971).

I. HABITAT DESCRIPTION AND REQUIREMENTS

The habitat requirements of the yellow-billed loon are complex because this species utilizes different habitat for breeding, migration, and wintering. Each of these three habitats requires three elements to sustain yellow-billed loon populations: (1) ample forage, (2) minimal human disturbance, and (3) an open-water environment low in toxins. The yellow-billed loon is in jeopardy because there are no mechanisms in place to ensure these habitat requirements are maintained.

1. Breeding habitat

Yellow-billed loons breed at 62-74º N latitude on deeper, clear-water, low-rimmed lakes >8 ha. with steady warm-season water levels, abundant food supply (fishery) and sufficiently long open-water seasons for incubation and fledging of young. Breeding lakes occur in low-lying treeless tundra regions, often near lowland-upland transitions, or

on large river deltas with untapped lakes (North 1994, McIntyre 1991, Sibley and Monroe 1990, Perfilev 1987, Derksen et al. 1977, Sjölander and Ågren 1976). Yellow-billed loons are generally replaced by common loons at tree-line (Barr 1994). However, 1 reference (Vorobev 1963 in Perfilev 1987) mentions very few nesting records from forest tundra zones in northeastern Siberia.

Yellow-billed loon breeding lakes are coastal in some places and inland in others. Throughout the summer range, breeding lakes are reported variable in density, spotted in concentration, "extremely uneven," sporadic, and dispersed (e.g. North 1993, Rogacheva 1992, North and Ryan 1986). Barr (1997) described the distribution of Canadian concentrations of prime breeding habitat as "limited and patchy with other suitable breeding lakes widely scattered." For breeding purposes, lake selection by yellow-billed loons may be a function of specific landscape and ecological relationships as yet not recognized (Earnst 2000b). Therefore, breeding distribution and relative abundance are currently not predictable by habitat type, however years of survey data in the area provide information regarding areas on Alaska's north slope used by the yellow-billed loon.

Nesting lakes must contain enough forage for adults and chicks, and be large enough to provide sufficient runway for these heavy-bodied birds to take-off. They must exhibit a thawed margin by late May or early June large enough for take-off and landing on open water and with sufficient passage to the ice-covered lake to permit foraging. And they must have some portion of shoreline or peninsulas or islands of gentle slope to permit nesting and on-shore brooding. Nesting and brooding often take place in leeward, protected areas. Sheltered, vegetated areas of nesting lakes are often used as protected areas for chicks during disturbance (Barr 1997, North 1994).

Water level must remain stable throughout nest inception and incubation. Drawdown during the nesting/brooding season, or refill after winter drawdown, may reduce nesting success (Fair 2002). Ice roads created for modern oil exploration and development on average require 1.0 to 1.5 million gallons per mile of road, over tens of miles distance (USDOI 1998). In the central Arctic oil fields, the industry is permitted to withdraw up to 15% of the under-ice volume of water in individual water bodies (lakes, ponds, lagoons etc).

Nesting lakes are > 8 ha. and breeding territories may include > 1 smaller lake. Territories do not overlap, but appear clustered throughout the distribution, raising questions of social interactions or physiographic requirements within the reproductive ecology (Fair 2002).

Breeding habitat for yellow-billed loons is widely dispersed and patchily distributed with restrictive characteristics. This environment includes nesting and brood-rearing lakes that are large enough to allow birds to land and take-off and which have an ample supply of clear water and small fish upon which adults forage and feed their chicks. Waterbodies that support over-wintering fish tend to be connected to small channels and other waterbodies. The smallest brood-rearing waterbody documented for this species is 17 ha (North 1994). Nesting and brooding generally occur along gently sloping shoreline

with some vegetative shelter available for hiding during disturbance. In one study examining the location of 20 yellow-billed loon nests, 35% were found on islands, 45% on lakeshores including peninsulas, and 20% on hummocks surrounded by shallow water (North and Ryan 1989). While it is difficult to determine exactly where this species will nest, it appears "deep open water with islands" is preferred over other waterbodies relative to their availability (Johnson et al. 2000).

2. Migration

Migration habitat for NPR-A nesting yellow-billed loons appears to be between arctic tundra nesting grounds and near-shore marine waters in the Yellow Sea adjacent to China (Schmutz, unpubl. data). Stopovers occur along the way, presumably including feeding, as the loons pass around Point Hope, Alaska; along the Chukchi Peninsula; near St. Lawrence Island; past or across the Kamchatka Peninsula; and across northern Japan and North Korea. Yellow-billed loons overwintering off southern Alaska may migrate overland to central Canadian breeding grounds (North 1994). Requirements of marine migratory habitats appear to be ample forage and lack of disturbance, significant mortality factors, and toxins.

3. Winter

Not much is known about winter habitat for the yellow-billed loon. It is thought that yellow-billed loons spend approximately 8 months exclusively in marine environments. For this reason the health of the marine wintering areas is extremely important to the long-term survival of this species. Based on observed declines in a number of Alaska marine birds, including red-throated loons and a number of sea ducks, there likely are substantial links between avian health and the health of marine ecosystems.

It appears that yellow-billed loons winter primarily in the Gulf of Alaska, the coastline of Southeast Alaska to northern Washington, and the Pacific Coast of east Asia and Russia, occurring near shore in protected waters (bays or archipelagos) from 50-61 degrees N (North 1994). Based on recent work by Schmutz (2004) it is likely that those wintering in the Gulf of Alaska are not Alaska NPR-A breeders. Further, because USFWS spring waterfowl surveys across the Yukon- Kuskokwim Delta virtually never see yellow-billed loons migrating through, it is unlikely the birds wintering in Alaska's Gulf are Arctic Alaska breeders (W. Larned, FWS pilot-biologist, pers. comm. with J. Fair).

IV. CONSERVATION STATUS

A. DESIGNATED POPULATION STATUS

In Alaska, the yellow-billed loon has been listed as a "species at risk" by the U.S. Geological Survey, Biological Research Division (USGS/BRD), Alaska Region. Because of its restricted range, small population size, specific habitat requirements, and threats to its breeding habitat, the yellow-billed loon is currently listed as a "Species of

Conservation Concern" with the USFWS Alaska Region (Earnst 2000b, Pierson, Schmutz, Wohl pers. comms. with J. Fair, USFWS 2002). At a recent USFWS sponsored candidate species workshop (May 2003), this species was also recognized as one of five bird species of special concern that should be considered for candidate status in Alaska. Both lists are intra-agency funding priority lists only and offer no protection for the birds or their habitat.

Alaska Audubon (2002) identified the yellow-billed loon as a species of "High Concern" on the National Audubon Society's Alaska Watch-List, a list of vulnerable or declining bird species.

On the Colville River Delta, Smith et al. (1993) selected the yellow-billed loon, due to its rarity, as 1 of 4 avian species for intensive survey and monitoring. North (1986) recommended protecting an area of the Colville River Delta from oil development due to the importance and sensitivity of the yellow-billed loon and later (North 1994) suggested that the species be formally recommended for state listing as a Species of Special Concern.

In Canada, Barr (1997) recommended, based on an extensive literature review, the formal status of "Vulnerable" due to low yellow-billed loon population levels, limited breeding habitat, and the species' inability to adapt to rapid environmental change, human disturbance, or the destruction of breeding habitat. For unreported reasons, the COSEWIC subsequently reduced Barr's assessment to the status of "Not At Risk."

The yellow-billed loon is included in the Red Data Book of the Russian Federation (2001) and in the Red Data Book of the North of the Far East of Russia (1998) due to lack of protection efforts, extreme rarity, and low productivity with frequent loss of fledglings during freeze-up (Kondratiev 1989). The species also is listed under category III (rare, in small populations not currently facing extinction but at risk due to restricted range and low numbers) in the Red Book of the Yakutian Republic (Perfilev 1987), which includes the large arctic coastal area between the 2 primary areas of yellow-billed loon breeding concentration (Flint et al. 1994, Knystautas 1993). This species is also listed in the Red Data Books of the Sakhalin Region (2000), the Primorsky Region (2002) and the Khabarovsk Region. The yellow-billed loon will also be included in the Red Data Book of Kamchatka, currently under preparation (Tokranov pers. comm.).

The yellow-billed loon was not listed in the Union of Soviet Socialist Republics (SSSR) (all of the Soviet Union) in 1978 (Promyshlen 1978), nor in the International Council for Bird Preservation (ICBP) worldwide Red Data Book (King 1981), likely due more to lack of attention and data than considered evaluations of "no risk."

B. CURRENT STATUTORY AND REGULATORY PROTECTION

In the United States and its marine coastal waters, the yellow-billed loon is protected under the Migratory Bird Treaty Act. In Alaska, it is a non-game species with protection under the Alaska Department of Fish and Game (ADF&G) regulations governing sport

hunting and the USFWS subsistence hunting regulations. As explained above, this species has no special protection in Alaska or the United States. Protection of this species in the U.S. will not be effective in the face of human development without integrated planning efforts and more agency attention.

The yellow-billed loon does not have any special conservation status in Canada. The species is protected under the Migratory Birds Convention Act, and there is a no hunting season in the regulations. However, subsistence hunting is allowed by Constitutionally defined rights of aboriginal peoples, and not specified further by regulations.

The U.S. Migratory Bird Treaty with the former Soviet Union would protect yellow-billed loons across their Asian breeding range, if it were implemented and enforced, an unlikely occurrence in the near future due to political and economic conditions in the former Soviet Union. Hunting regulations for at least some of the Soviet republics, e.g., the Yakutian Republic 1962-1981 (Perfilev 1987), restricted or completely prohibited the taking of yellow-billed loons. For the former Soviet Union, however, current reports of regulation or enforcement efforts are difficult to acquire.

IV. POPULATION STATUS

A. OVERVIEW

No worldwide or continental population trends are available (North 1994, Barr 1997). Population trends for the yellow-billed loon are difficult to determine due to lack of research and understanding of migration patterns. No adequate data exist for reliably estimating trends of the world or Canadian populations of yellow-billed loons (Barr 1997). Some apparent declines in localized yellow-billed loon populations may be the result of gross and inaccurate early estimates; apparent increases may be the result of the recent discovery of previously unrecognized breeding grounds.

B. ABUNDANCE ESTIMATES

1. Regional Population Data and changes

a. Alaska

Fair (2002) estimates that 3,650 yellow-billed loons occur in Alaska. North (1994) reported that a "significant fraction" of the global population of yellow-billed loons

summers on Alaska's North Slope. However, no scientifically accurate population estimates exist for Eurasia, Canada, or worldwide (Barr 1997, North 1994) to enable comparisons.

Most population surveys focus on breeding grounds. It may be highly important to breeding population dynamics of yellow-billed loons, and to the potential obfuscation of population declines in breeding ground survey estimates, that large "surplus" non-breeding populations of adults are reported on marine waters adjacent to areas of breeding concentrations from Barrow, Alaska, to King William Island, Canada, in summaries by Barr (1997) and North (1994). North (pers. comm. with J. Fair) also found non-paired adults adjacent to breeding territories on the Colville River Delta 1983-1984.

Most aerial waterfowl surveys do not distinguish between numbers of breeding loons (nesting pairs) and total numbers on the breeding grounds. In determining the long-term health of the population, the fraction of the total breeding-ground population of yellow-billed loons which nests is a more informative number than total breeding-ground population. Nesting frequency, percent of territorial pairs that actually nest in a given year, appears highly variable in yellow-billed loons (Field et al. 1993, North and Ryan 1988, Earnst pers. comm. with J. Fair). Therefore, it is important to recognize that total adult population estimates do not accurately reflect breeding populations.

The preponderance of yellow-billed loons breed on the arctic coastal plain (North Slope), concentrated within the NPR-A (King and Brackney 1997, Groves pers. comm. with J. Fair, etc.)

With the exception of incomplete on the ground censuses on the Colville River Delta and extremely limited aerial surveys conducted specifically for yellow-billed loons (e.g., Earnst 2000b, 1998, McIntyre 1991), population data for yellow-billed loons have been derived incidentally from aerial surveys designed and scheduled for waterfowl breeding pair counts.

Reliable yellow-billed loon population estimates for Alaska’s arctic coastal plain since 1990 range from 2,400 (Brackney and King 1992) to 4,988 in 1996 (King and Brackney 1997). King (1979b) had estimated 4,988 in 1978 as well. Estimates fell as low as 1,468 in 1987 (Mallek et al. 2002, Groves 1996), but estimates since 1997 are produced from more complete surveys, better assumptions regarding distribution, and stronger models, and are likely more accurate (King, Mallek pers. comm. with J. Fair). Higher estimates may have been biased due to weaker interpretations of breeding distribution (McIntyre 1991) or were due to large confidence intervals typical for low-density species (Mallek pers. comm. with J. Fair).

FWS survey estimates for the arctic coastal plain for 1997-1999 were 3,062, 3,556, and 3,124, respectively (Mallek et al. 2002) and were considered at the time to be likely more accurate than earlier estimates (Mallek pers. comm. with J. Fair). In 2000-2002, however, FWS arctic coastal plain surveys resulted in estimates of 2,454, 1,331 and 1,948 respectively, (Mallek et al. 2002). Based on the Alaska Coastal Plain survey the yellow-

billed loon population was below its long-term mean (2,957) for the 3 years of 2000-2002 (Id.). The 2002 population was 34% below its long-term mean (Id.). The 2003 Coastal Plain survey had a population index of 3,270 yellow-billed loons (Mallek et al. 2003), slightly above the long-term mean. Because yellow-billed loons are observed in low numbers during the Coastal Plain survey, variability is expected in estimates due to high spatial variability (Id.).

Table 1: Population estimates of yellow-billed loons on the Arctic Coastal Plain, Alaska 1986-2003

YEAR	1986	1987	1988	1989	1990	1991	1992	1993	1994
# YBL	3,203	1,468	1,913	3,337	2,091	3,354	3,147	2,578	3,429

YEAR	1995	1996	1997	1998	1999	2000	2001	2002	2003
# YBL	4,282	4,988	3,062	3,556	3,124	2,454	1,331	1,948	3,270

(Data from Mallek 2004)

It should be noted that the USFWS also conducts a coastal plain eider survey each year that attempt to counts yellow-billed loons (Larned 2002). However, because the eider surveys provide less areal coverage than the Arctic Coastal Plain (ACP) survey, and because they occur slightly earlier in the season (before some yellow-billed loons initiate nesting) than the ACP survey, they are less reliable for estimating yellow-billed loon populations. For this reason, the best estimate available for the current population of breeding yellow-billed loons on the breeding grounds of the arctic coastal plain may be Mallek's et al. (2002) 1986- 2001 mean of 2,957 loons. A more conservative estimate would include annual data since greater accuracy was believed achieved: a 1997-2001 mean of 2,705.

b. Canada

Canada has a speculated population of roughly 8,000 yellow-billed loons (Fair 2002). One recent reference estimated a mean population of 950 adult yellow-billed loons on

northwestern Victoria Island north of Prince Albert Sound and west to 110º W; half of the population was on Prince Albert Peninsula (Cornish and Dickson 1996). Dickson (pers. comm. with J. Fair in Barr 1997) estimated a population of 1,431 for all of western Victoria Island, including 3 known concentration areas.

Anecdotal evidence suggests decline. Bent (1919) reported the yellow-billed loon as a numerous breeder in Liverpool and Franklin Bays (Northwest Territories), where Palmer (1962) found them scarce. Snyder (1957 in Barr 1997) reported the species breeding on the Mackenzie Delta, where Godfrey (1986) reported no breeding. Barr (1997) and North (1994) cited older references reporting yellow-billed loons to be abundant on Victoria Island, and during 1992-1994 surveys, Cornish and Dickson (1996) found densities up to 0.035/sq. km. there, apparently reflecting continued "abundance" at least in some areas of the island. However, McLaren and Alliston (1981 in Barr 1997) found the yellow-billed loon to be the most common loon on Victoria Island, while a decade later Cornish and Dickson (1996) found the Pacific loon *(G. pacific*a) most common on the island and the yellow-billed loon only 10-24% of loons identified to species.

c. Eurasia

Few sources offer population estimates for Eurasia. The International Waterfowl and Wetlands Research Bureau (IWWRB) accepts a yellow-billed loon population of <10,000 in the Western Palearctic, and Barr (1997) suggested that there may be <10,000 in all Eurasia. However, previous attempts to extrapolate densities from concentration areas to the entire Russian range have led to unreasonably high total population size estimates (Fair 2002). Based on Kondratiev (1989) estimation of 2,000 individuals on the Chukchi Peninsula and the Taymyr Peninsula (Rogacheva 1992) and another 1,000 throughout the remainder of the range in Russia, the estimated population of Yellow-billed loons in Russia is 5,000 individuals (Fair 2002).

Numbers in Norway and Finland appear low enough to comprise an insignificant percentage of the world population.

In Russia, Kretchman et al. (1991) reported a significant reduction of yellow-billed loons on the breeding grounds June 1977-July 1983, but the decline was very localized. Barr (pers. comm. with J. Fair) speculates that yellow-billed loons are suffering declines in Russia due to oil spills and unenforced environmental protection there. (More than 10 million metric tons of oil, equivalent to 300 Exxon Valdez oil spills, are "lost" there annually [Barr 1997].) Brazil (1991) reported the yellow-billed loon to be a rare winter visitor to the northern Japan coast, though the loon had once been "common" near Hokkaido in the springtime.

In contrast to the above results, McIntyre (1991) reported 27% more lakes (total n=51) with pairs of yellow-billed loons near Alaktak in 1989 than Sjölander and Ågren had found in 1972.

2. Worldwide Population Estimates

Reported densities for yellow-billed loons are geographically incomplete, vary highly in areal context, are often the product of waterfowl surveys conducted on schedules appropriate to waterfowl but not yellow-billed loon phenology, and are often only estimates themselves, with large standard errors. The yellow-billed loon's clumped distribution is additionally problematic to standard statistical survey estimates. These compounding errors led Barr (1997) and North (1994) to conclude that no worldwide estimates of yellow-billed loon populations are available. Reliable population and density data are too scant throughout the yellow-billed loon's summer range, with the exception of Alaskan populations and a few other surveys, to make a scientifically acceptable estimation. North (1993) stated that "population estimates [for yellow-billed loons] are only guesswork", and except for recent estimates derived from FWS surveys in Alaska and by the CWS for western Victoria Island in Canada, North's statement remains true.

However, given the speculative estimates above, the best worldwide population estimate is 16,650 individuals (Fair 2002). This estimate is based on an Alaskan population of 3,650 individuals, a Canadian population of roughly 8,000 and Eurasia population of 5,000 (Id.).

V. THE YELLOW-BILLED LOON IS A LISTABLE ENTITY UNDER THE ESA

The USFWS has two options for listing the yellow-billed loon under the ESA:

1) Endangered or Threatened throughout its entire range in the U.S., Canada, and Eurasia
2) Endangered or Threatened as a Distinct Vertebrate Population Segment (DPS) in the United States

This petition is submitted for the worldwide population of the yellow-billed loon, however, if the Fish & Wildlife Service finds that listing of the Canadian and Russian population is not warranted, this petition should be treated, in the alternative, as a petition for the U.S. population of the yellow-billed loon as a DPS.

The ESA provides for the listing of all species that warrant the protections afforded by the Act. "Species" is defined under the ESA to include any "subspecies of fish or wildlife or plants, and any distinct population segment of any species of vertebrate fish or wildlife, which interbreeds when mature." 16 U.S.C. § 1532(16) (1994), as amended by Pub. L. No. 95-632, 92 Stat. 3751 (1978). ESA protection was extended to distinct population segments because the management and protection of populations is critical to the preservation of species.

Congress recognized that the DPS policy marked a "significant shift" away from previous federal statutes that protected only species facing "worldwide extinction," H.R. Rep. No. 93-412, at 10 (1973). Congress also recognized the importance a broader definition of endangered species would afford in terms of protection for U.S. populations of species that have portions of or their principal range abroad (See H.R. Rep. No. 412, at 10). Furthermore, as one court summarized, the legislative history behind protecting a DPS reflects a consistent policy decision: "that the United States should not wait until an entire species faces global extinction before affording a domestic population segment of a species protected status." Southwest Ctr. For Biological Diversity v. Babbitt, 926 F. Supp. 920, 924 (D. Ariz. 1996).

The USFWS has extended the DPS policy in several situations similar to that of the yellow-billed loon. For example, the Fish and Wildlife Service listed bald eagles in the lower 48 states, even though they are not reproductively isolated or genetically different from eagles in Canada or Alaska. 43 Fed. Reg. 6, 23 (1978). Similarly, in listing grizzly bears, the Service focused solely on grizzly populations in the coterminous United States, making no effort to assess declines in Canada or Alaska. 40 Fed. Reg. 31,734 (1975). The gray wolf, Canada lynx, woodland caribou, desert bighorn and bull trout listings adhered to this same pattern. A similar finding was also made in the final listing determination for the Alaska breeding population of the Steller's eider.

The ESA does not define the term "distinct population segment" nor does the scientific literature. In the "Policy Regarding the Recognition of Distinct Vertebrate Population Segments under the Endangered Species Act," the FWS defined "distinct population segment" for purposes of listing under the ESA. 61 Fed. Reg. 4721. Under the policy, three elements are to be considered sequentially in determining the status of a potential DPS: (1) the discreteness of the population relative to the rest of the species; (2) the significance of the population segment to the species; and (3) the population segment's conservation status in relation to the Act's standards for listing. (Id.) The Alaska breeding population of the yellow-billed loon clearly qualifies as a "distinct population segment" ("DPS") under the ESA as demonstrated below.

A. DISCRETENESS

A population will be considered discrete if it satisfies ***one*** of the following criteria: (1) it is markedly separated from other populations of the same taxon as a consequence of physical, physiological, ecological, or behavioral factors, ***or*** (2) it is delimited by international governmental boundaries within which differences in control of exploitation, management of habitat, conservation status, or regulatory mechanisms exist that are significant in light of section 4(a)(1)(D) of the Act. (Id.) (Emphasis added).

Population discreteness for the Alaska breeding population of the yellow-billed loon based on the first criteria is difficult to determine with the available data and research. To date, no genetic studies have been done to quantify discreteness of various breeding concentrations across Alaska, Canada, and Russia. Although it is unclear whether

Alaska populations of yellow-billed loon are physically discrete, they are clearly discrete based on the second international boundary criteria. This criteria was established by Congress to recognize populations that might be negatively affected by international inconsistencies in conservation policy (USFWS 1996).

In regards to the listing of U.S. Atlantic salmon populations a district court recently reasoned that "[t]he use of international boundaries to delineate distinct population segments is consistent with congressional intent that we should not allow the United States population of an animal to go extinct merely because it is more abundant elsewhere." State of Maine v. Norton, 257 F. Supp.2nd 357, 2003 at 26 (D. Maine Apr. 24, 2003).

This reasoning has been applied in other situations as well. The Fish and Wildlife, for example, recently determined that the lynx (*Lynx canadensis*) in the United States is discrete from lynx in Canada because of the international boundary standard, stating:

"Canada has no overarching forest practices legislation, such as the United States National Forest Management Act, governing management of national lands and/or providing for consideration of wildlife habitat requirements. Additionally, in Canada, lynx harvest regulations, such as length of season and quotas, vary, being regulated by individual provinces or, in some cases, individual trapping districts. Therefore, we conclude that the contiguous United States population of the lynx is discrete based on the international boundary between Canada and the contiguous United States due to differences in management of lynx and lynx habitat." 65 Fed. Reg. 16060 (2002).

While the Service's findings above relate to a forest dependant species, this same reasoning applies to the yellow-billed loon. In the USFWS's recent determination to list the Alaska breeding population of Steller's eiders as a DPS it found the population discrete because it is "physically separated from Asia nesting populations by hundreds of kilometers across the Bering and Chukchi seas." 62 Fed. Reg. 31752 (1997). Further, the FWS concluded that the population was discrete because "the Alaska breeding population of Steller's eiders is delimited by international boundaries. Within these international boundaries differences in conservation status exist"(Id.).

Numerous differences in management exist between the US and the other countries in which the range of the yellow-billed loon extends. Canada and the US are more similar in their management than either is to Eurasia, but they have some marked differences. In the US, policy tends to develop through legislation and litigation. In contrast, Canadian policy has traditionally allowed agencies to develop their own policies through enabling legislation. In Canada provinces have constitutional responsibility over natural resources and predominantly control public land. In comparison most public land is the US is owned by the federal government not the states (this is certainly the case in Alaska where the yellow-billed loon occurs).

Where legislation does exist to protect endangered species, the US and Canadian laws are markedly different. For example, Canada recently enacted the Species at Risk Act

(SARA), modeled after the ESA in the United States. The SARA at this time differs significantly from the ESA in that it only applies to Canadian federal lands, not private lands. The Act has also been heavily criticized for its emphasis on voluntary incentives, rather than enforceable requirements to protect species. The SARA also leaves habitat protection up to government's discretion, a tool little employed for fear of upsetting the provinces. Therefore, despite the passage of this national legislation, species issues will for the most part continue to be addressed at the provincial level. Other significant differences in management between the US and Canada include Canada's being a party to the Convention on Biodiversity, but the US is not; and that subsistence hunting is allowed by constitutionally defined rights of aboriginal peoples in Canada and not specified further by regulations.

Neither Canada nor Eurasia has recognized the vulnerability of the yellow-billed loon and neither has laws or regulations in place to protect this species or its habitat. Further, since the Russian or Canadian population of yellow-billed loons could be affected at any time by human activities beyond the control of US regulatory authority, it is appropriate that, at a minimum, the Alaska breeding population be found discrete. Further differences in the regulatory mechanisms available to protect this species throughout its range are discussed in section VI-D of this petition.

B. SIGNIFICANCE[1]

The definition of significance includes, but is not limited to, the following factors:

> 1. Persistence of the discrete population segment in an ecological setting unusual or unique for the taxon,
>
> 2. Evidence that loss of the discrete population segment would result in a significant gap in the range of a taxon,
>
> 3. Evidence that the discrete population segment represents the only surviving natural occurrence of a taxon that may be more abundant elsewhere as an introduced population outside its historic range, or
>
> 4. Evidence that the discrete population segment differs markedly from other populations of the species in its genetic characteristics. (61 Fed. Reg. 4722.)

[1] It should be noted that petitioners believe that once a population is deemed discrete, it is duplicative to then determine if the population is significant because "distinct" and "discrete" are synonyms. The words are used interchangeably in dictionary definitions, see Webster's New Collegiate Dictionary (1997), and neither word contains a "significance" component. Because "discrete" is synonymous with "distinct," once FWS determines that a "discrete" population is at risk of extinction, it has a non-discretionary duty to list the species as endangered.

The Alaskan yellow-billed loon population is significant ecologically, culturally, and as an environmental indicator, and extirpation of this population would clearly result in a gap in this species' range.

1. Ecological significance

Undeniably, more research is needed to determine the distinctness of yellow-billed loon populations. However, it is believed that yellow-billed loon populations may be separated based on differences in breeding, migration and wintering range.

North (1994, 1993) postulated that yellow-billed loons wintering in Alaskan waters migrate overland directly to Canadian breeding grounds, and that Alaskan and arctic Canadian breeding populations winter off the coasts of Japan and Siberia. Key evidence for trans-Pacific and overland hypotheses is the extremely low number of migrants reported for both (1) the coastal route between southern Alaskan wintering areas and the Seward Peninsula (North 1993, Larned pers. comm. with J. Fair), and (2) the coastal route east along the Beaufort Sea coast.

Johnson and Richardson (1981) reported the total number of yellow-billed loons migrating along the Beaufort Sea coast as 52-109. Hawkins (1987) and Salter et al. (1980) reported 52 and 47, respectively, migrating eastward along the Yukon coast in 1975. In June 1992 and 1993, however, Alexander et al. (1995) observed hundreds (> 600 in 1992) of yellow-billed loons in open waters from Herschel to Victoria Islands, particularly in the Lambert Channel polynya. During similar surveys from 1986-1987, <5 yellow-billed loons were seen, suggesting variable migration routes or, more likely, some phenological influence. Barry (1976 in North 1994) reported an unsubstantiated estimate of 4,500 in spring migration past Cape Dalhousie, further suggesting variable or offshore routes, possibly following spring open-water leads (Barr 1997).

The postulation for the trans-Pacific and overland hypotheses also seems to be supported by recent movements of 12 loons in 2 different areas of Alaska's NPR-A. The birds were fitted with satellite transmitters and were tracked migrating along the east Asian coastline as far as China's coastline along the Yellow Sea. While this research is inconclusive, it does offer evidence that yellow-billed loons in Alaska are likely ecologically distinct from those in central Canada and those that winter off southern Alaska.

2. The loss of the U.S. population would result in a significant gap in the taxon's range

The DPS Policy does not define what constitutes a "gap" for the purposes of the second significance factor. *See* 61 Fed. Reg. at 4725. The FWS has applied the term in a variety of ESA listing situations to include loss of both peripheral populations as well as "bridge" populations. The yellow-billed loon population in Alaska falls into this later "bridge" category and is in many ways analogous to the ESA listing decision regarding the Peninsular bighorn sheep in the United States. In that situation, the FWS recognized should the sheep population in the United Sates go extinct that populations in Mexico

would be separated from all other bighorn sheep. *See* 63 Fed. Reg. at 13,136. Since Alaska constitutes the middle-ground between the populations of yellow-billed loons in Eurasia and in Canada it fills a similar important link for the global survival of this species.

Approximately 22% of the worldwide breeding population of yellow-billed loons are thought to breed in Alaska. The loss of this population would significantly reduce the geographic size of the yellow-billed loons' range. One of the main threats to the yellow-billed loon is the degradation, fragmentation, and loss of habitat. The loss of habitat in Alaska would represent a significant gap in the critical breeding and wintering marine habitat for the species worldwide. Because the current global population of the yellow-billed loon is small, any loss of habitat, particularly high-quality habitat consistently used by this species, may result in harm at the global population level.

The FWS has recognized that reduction in geographic range size can constitute a significant gap in the taxon's range in a variety of cases. For example, reducing the western yellow-billed cuckoos current range by more than 20 percent was found to constitute a significant gap. See 66 Fed. Reg 38,611, 38,622 (2001). FWS also deemed the loss of a salamander population to be significant in part because it would result in "the curtailment of the range of the species as a whole". See 65 Fed. Reg. at 57,244. Lastly, loss of the northern population of the bog turtle, that occurs in seven states and represents over 50 percent of the species' range, was deemed significant as it would result in a "significant void in the range and distribution of the species." See 62 Fed. Reg. 59,605, 59,609 (1997).

Loss of the U.S. breeding population of yellow-billed loons would also be significant because it would reduce the historical range of this taxon. The FWS has found a significant gap in a taxon's range to exist on this ground in other situations including the decision to list the western sage grouse and the western yellow-billed cuckoos. See 66 Fed. Reg. at 22,992 (2001); 66 Fed. Reg. at 38,622.

Lastly, because the U.S. breeding population of yellow-billed loons constitutes nearly one-quarter of the estimated global population, loss of the population would represent a significant reduction in the worldwide population of the species. Despite the uncertainty regarding the ecological distinctiveness of this species, it is very clear that the loss of the U.S. population would result in a significant gap in the taxon's range.

3. Environmental indicator

The yellow-billed loon is extremely sensitive to disturbance and vulnerable to toxic contamination and therefore is significant in terms of monitoring environmental change. Given adequate baseline data and continued monitoring, the yellow-billed loon has the potential to serve as an environmental barometer or bio-indicator of environmental changes, effects from development, toxin exposure, contaminant accumulation in the arctic, and cumulative effects on its breeding range (Evers pers. comm. with J. Fair), just as the common loon has become such a barometer across North America (e.g., Evers et al. 1998, 1996).

4. Cultural and National significance

Alaska is the only location in the United States where the yellow-billed loon breeds. The FWS has recognized this reasoning appropriate in looking at the significance prong of the DPS Policy. For example, in determining if loss of the Alaska breeding population of Steller's eider was significant the USFWS reasoned that it was in part because "Alaska is the only portion of the species' breeding range over which the United States government can exercise its authority to provide for the conservation of the species during nesting." 62 Fed. Reg. 31752. If the viability of the yellow-billed loon is at risk, the importance of providing for the conservation of the species in Alaska will increase. As the FWS stated in the context of the Steller's eider listing, "by securing the survival of the Alaska breeding population, access to the species for scientists to identify the factors controlling the population and causing declines in other areas will be facilitated. Ultimately, this may be essential to the survival of the species as a whole."(Id.)

Lastly, the yellow-billed loon has been nesting in Alaska for likely tens of thousands of years. They have been, and remain, an important part of the Native heritage of Alaska and the nation. For example, feathers of the yellow-billed loon are used as a headdress in a traditional Box Dance ceremony bringing in the New Year. This ceremony is still performed in Barrow and Wainwright; and was historically performed in Atqasuk and Nuiqsut. The dance is described and photographed by Hess (1994). Future generations of Alaska Natives and others have a right to continue to enjoy these birds.

C. CONSERVATION STATUS

The final criterion for classifying a DPS is the conservation status of the species. The DPS Policy does not define the term "conservation status." *See* 61 Fed. Reg. at 4725. In general terms the FWS has construed the term "conservation status" to mean the number of individuals left in the population.

The absolute size of Alaskan and worldwide yellow-billed loon populations is cause for concern, especially since most of the Alaskan yellow-billed loon breeders are concentrated within the NPR-A between the Meade and Colville Rivers (McCaffery 1999; also See Figure 4) and are often clumped in concentrated breeding spots, marine feeding habitats, and premigratory gathering areas (Barr 1997) and therefore vulnerable to adverse impacts from catastrophic events such as oil spills.

The yellow-billed loon clearly warrants listing as threatened or endangered, as discussed throughout this petition and demonstrated in the following section.

VI. THE YELLOW-BILLED LOON IS ENDANGERED OR THREATENED UNDER THE ESA

The Service is required to determine whether a species is endangered or threatened based on *any* of the following factors: (1) the present or threatened destruction, modification, or curtailment of its habitat or range; (2) over-utilization for commercial, recreational, scientific or educational purposes; (3) disease or predation; (4) the inadequacy of existing regulatory mechanisms; or (5) other natural or manmade factors affecting its continued existence. 16 U.S.C. § 1533(a)(1) and 1533(b) (emphasis added).

All listing decisions must be made solely on the basis of the best scientific and commercial data available. 16 U.S.C. § 1533(b)(1)(A). The legislative history of this provision clearly states the intent of Congress to "ensure" that listing decisions are "based solely on biological criteria and to prevent non-biological criteria from affecting such decisions" H.R. Rep. No. 97-835, 97th Cong. 2d Sess. 19 (1982). As further stated in the legislative history, "economic considerations have no relevance to determinations regarding the status of species." Therefore, political and economic arguments may not be considered by the FWS in its determination of whether to list this species.

A. PRESENT OR THREATENED DESTRUCTION, MODIFICATION, OR CURTAILMENT OF THE YELLOW-BILLED LOON'S RANGE

Throughout its range in Alaska, Canada, and Russia, the yellow-billed loon breeds almost exclusively on lands with no special protection. Because the current global population of the yellow-billed loon is small, any loss of habitat, particularly high-quality habitat consistently used by this species, may result in harm at the population level.

1. Breeding Range

Amount of suitable breeding habitat, including lakes of appropriate size and depth, appears to be a prime-limiting factor for yellow-billed loons in North America and likely elsewhere. Breeding habitat is widely dispersed and patchily distributed and the most restricted of any loon species. It is clear that yellow-billed loons have highly particular habitat needs within their breeding range, therefore, the loss of breeding habitat may have serious consequences for the long-term viability of this species.

a. Alaska

Arctic

Crucial breeding habitat for this species is threatened from potential destruction, modification and fragmentation from oil and gas development. Cumulative impacts to wildlife have occurred from various industrial activities associated with oil and gas exploration and development on Alaska's North Slope (NRC 2003). Habitat fragmentation, the breaking apart of habitat into small patches, may impact the distribution and abundance of wildlife. As development continues to expand across Alaska's Arctic, the amount of sink habitat for this and other species will continue to

increase. Oil and gas development may result in direct habitat loss, related to the construction of roads, pads and other infrastructure. Development of roads in yellow-billed loon breeding habitat increases access for subsistence hunting, illegal poaching, and predators, which tend to follow roads or human food smells. Vegetation damage or changes due to exploration or road development may induce permafrost decay that subsequently allows breaching of lakes by rivers (North 1994). Oil and gas development also brings an increased risk of oil spills and toxic contamination.

The destruction and fragmentation in the yellow-billed loon's primary nesting area in the United States, particularly on the Arctic coastal plain, must be viewed in a cumulative manner. In looking at the cumulative impacts of such development on Alaska's wildlife, the NRC recently recognized that "[R]eproductive success rate of some bird species in the developed parts of oil fields has been reduced to the extent that it is insufficient to balance mortality." NRC at 253. The NRC suggests that it is important to distinguish "source" areas from "sink" areas when analyzing the effects of further development. "As industrial activities continue to expand, increasing numbers of sink areas are likely to be created and more and more source areas are likely to be depleted. Ecology theory and empirical data indicate that populations can decline suddenly if source areas are significantly degraded." (Id.)

Alaska's western arctic is extremely important for the Alaska breeding population of the yellow-billed loon. Figure 4 demonstrates known areas of breeding density for yellow-billed loon on the Artic coastal plain, the majority of which are located within the NPRA. As detailed below, this crucial breeding is now threatened by oil and gas development.

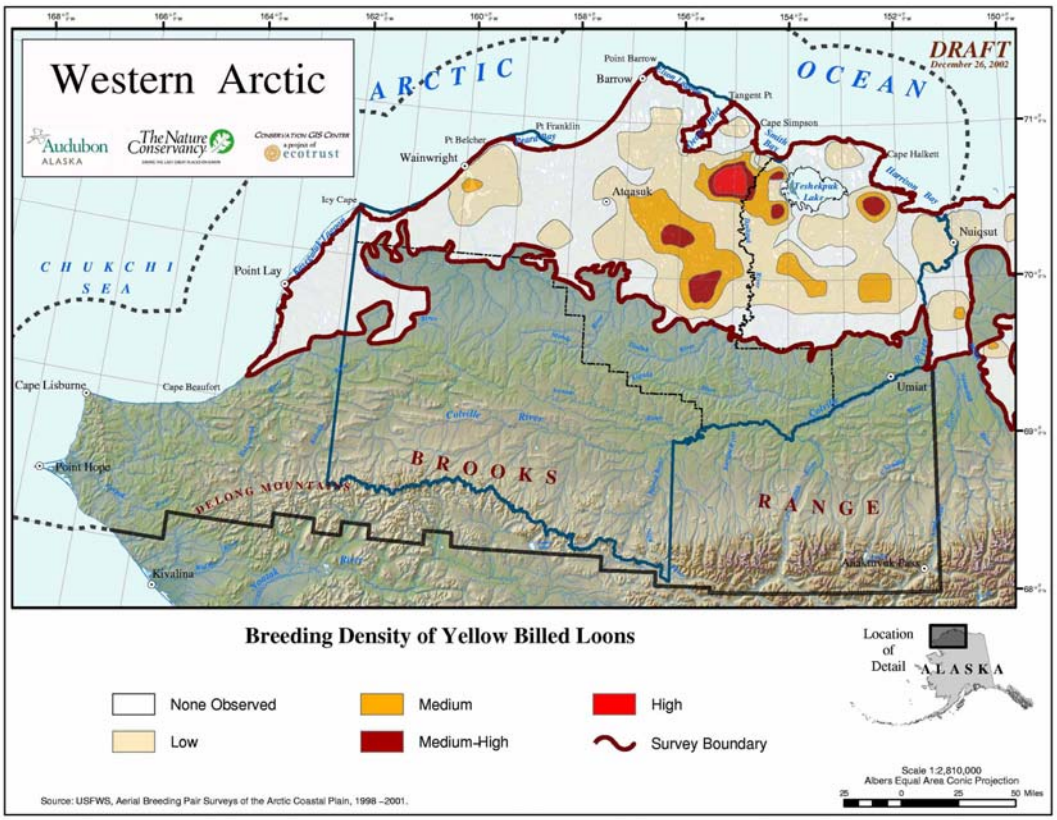

Figure 4: Breeding density of yellow-billed loons in the western Arctic (Audubon Alaska 2003).

National Petroleum Reserve Alaska-Northeast Planning Area

Approximately 80% of the Alaskan population, and 18% of the speculated world population, of yellow-billed loons are found within the National Petroleum Reserve-Alaska, primarily scattered in the area of the Meade and Ikpikpuk Rivers. In 1997, for the purposes of offering public lands for lease by private oil and gas companies, the U.S. Department of the Interior, Bureau of Land Management (BLM), created the 4.6 million acre Northeast Planning Area of the NPR-A. This area is roughly bounded by the Colville River Delta on the east, Ikpikpuk River on the west, and Colville River on the South. This planning area contains 24% of the (estimated) Alaska arctic coastal plain population, 6% of the North American population, and 4% of the worldwide population of yellow-billed loons. In 1998, BLM elected to open 87% of the 4.6 million acre Northeast Planning Area of the NPR-A to extensive oil and gas leasing. Seismic exploration continues to be allowed in the entire area. The DEIS for the Northeast Planning Area recognized 7 yellow-billed loon breeding concentration areas with surveyed densities > 0.57 birds/sq. km. All EIS alternatives allowed for development in 5 to 7 of these 7 critical areas. The preferred alternative selected by BLM protected only 1 high-density concentration area, immediately west of Teshekpuk Lake in the No Surface Activity Zone. Now even this one protected area is at risk.

In April 2003 the BLM announced it would be preparing a Supplemental Environmental Impact Statement to decide whether additional areas in the northeast planning area will be available for oil and gas leasing. Of particular concern is the 600,000 acres around Teshekpuk Lake that were placed off limits to leasing in the original EIS and the 240,000 acres that were made available for leasing but with no surface occupancy allowed. The Northeastern NPR-A planning area is perhaps the most important breeding habitat for the yellow-billed loons including the areas east and west of the Teshekpuk Lake area (North 1994; King and Brackney 1997). Scoping for development in this area began in the fall of 2003 and a final record of decision is expected at the end of 2004. The first lease sale, which may include areas around Teshepuk Lake, is expected in June 2005.

Seven lease sales have occurred in the Northeast Planning Area since 1993 and one hundred twenty nine wells have been drilled in the NPRA to date. Oil and gas lease sales held in the area in 1999 and 2002, resulted on the leasing of 193 tracts, totaling approximately 1.4 million acres and includes Conoco-Phillips' (CP) Alpine Development project. Conoco-Phillips' has plans to expand upon its current Alpine Project by developing five new satellite drilling pads, two in the Colville River Delta adjacent to the NPR-A and three in the Northeast NPR-A planning area (BLM Alpine 2004). BLM estimates that 296 yellow-billed loons occur within the Alpine Satellite Plan Area (BLM 2004). The CP project proposes placement of 20 to 30 wells on each pad and the construction of a 19-mile gravel road connecting from three NPR-A fields (Alpine West, Lookout and Spark) within the Northeast Planning Area to the Alpine field road system outside the planning area. (Id.)

BLM released a Draft EIS on the Alpine Satellite Development Plan in January 2004. The alternative favored by the applicant calls for numerous stipulations added to the Northeast NPR-A ROD to protect wildlife be violated. These include locating oil infrastructure within 500 feet of some water-bodies and constructing permanent oil facilities within the 3-mile setback from Fish Creek. Surveys in the Fish Creek drainage identified concentrations of yellow-billed loon nests in the area (Burgess et al. 2003b *in* BLM Alpine 2004). The Plan also calls for construction of 33 miles of new pipeline, power-lines, bridges and additional gravel roads. The DEIS clearly shows that yellow-billed loons have been seen nesting in areas where gravel pads and access routes would occur including around the Fish Creek area. Further, the plan includes seven bridges and five culvert batteries to be constructed over several rivers, lakes, and unnamed drainages, the largest of which would span the Nigliq Channel of the Colville River, an area where yellow-billed loons have nested (BLM Alpine 2004). Portions of the pipeline needed to transport oil, water and gas would pass through known nesting and brood-rearing yellow-billed loon habitat (BLM Alpine 2004). Based on survey data showing use of the project area by yellow-billed loons, BLM recognized that nesting yellow-billed loons could be affected by habitat loss and alteration at four of the Alpine Satellite development sites, and brooding habitat would be lost at two sites (BLM Alpine 2004). Clearly should this project be approved, important habitat for the yellow-billed loon will be further fragmented and the risk of disturbance to nesting activities increased.

An additional threat to the yellow-billed loon in this area is the proposed Alaska Department of Transportation's "Colville River Road". The road will connect the 18 mile roadless gap between the industry's spine road, which extends south and west from Prudhoe Bay, to Kuukpik Native Corporation lands just south of the Village of Nuiqsut in NPR-A. This project will involve the first bridge over the Colville River and will further fragment this area. Scoping for this project is expected to occur in the summer of 2004.

National Petroleum Reserve Alaska –Northwest Planning Area

In January 2004, the BLM signed a Record of Decision finalizing their plans for the 8.8 million acres that form the Northwestern Planning Area of the NPR-A. The ROD allows for oil and gas leasing in the entire planning area. While the ROD does defer leasing on 1.57 million acres for ten years, it offers no real or permanent protection, as these areas are available immediately for intrusive seismic surveys and leasing in the near future. The ROD does call for aerial surveys for yellow-billed loons to be conducted "for at least 3 years before authorization of construction of facilities proposed for development that are within 1 mile of a lake 25 acres or larger in size."(BLM 2004) Should yellow-billed loons be present, the ROD calls for design and location of facilities such that disturbance is minimized. Id. While it is good to see that the BLM recognizes the yellow-billed loon as a sensitive species and that oil and gas activities may harm the breeding population within the project area, the ROD offers nothing in the way of true protections for this species. Discretionary language such as "minimization" of impacts and "may" prohibit development is significantly different than prohibiting disturbance activities in these areas. Further, as revealed by the Alpine Satellite project such stipulations can be lifted if BLM so chooses.

There are three major high-density nesting concentrations areas for yellow-billed loons in the NW Planning area: one east of Dease Inlet and two in the southeast portion of the planning area. By failing to protect these important high-density nesting concentration areas, the ROD puts the yellow-bill loon and important known habitat areas at risk. Further, the ROD allows for off-road vehicle use in the entire project area, increasing the risk that nesting or brooding yellow-billed loons may be disturbed. The BLM anticipates holding the first lease sale in this area in June 2004.

National Petroleum Reserve Alaska-South Planning Area

BLM also plans on beginning a planning process in 2004 for oil and gas activity in the 9.7 million acre South planning area of the Western Arctic Reserve -- nearly all of the remaining land outside of the northeast and northwest planning areas. The Current "footprint" of the existing North Slope oil facilities and roads covers about 10,000 acres, extends across an 800 square mile region, nearly 100 miles from east to west. It continues to grow as new oil fields are developed. The effects of these existing and future facilities extend far beyond the immediate footprint of oil-field infrastructure. No provisions have been made to avoid or guide oil and gas development within particularly high-density areas or to protect the vicinity of known or suitable nesting and brood-

rearing lakes from human disturbance. While direct habitat loss and fragmentation may be great concerns to this species, of equal or perhaps greater concern is the increase of predators linked to development on the North Slope. This issue is discussed in detail below.

Arctic Ocean

The Mineral Management Service recently offered for oil and gas leasing tracts in the Beaufort Sea, and has plans to offer additional tracts in the Beaufort Sea, and perhaps Bering and Chukchi Seas, for lease in the near future. Oil spills from these tracts and other lease-related industrial activities may directly and adversely impact yellow-billed loons that use these marine waters and adjacent areas.

Seward Peninsula and the Kotzebue lowlands

An estimated 600-800 adult loons are found on Alaska's Seward Peninsula and the Kotzebue lowlands. The birds in this area are at risk from habitat fragmentation resulting from mining activity and associated infrastructure. New areas, such as the Ahklun and Kilbuck Mountains show potential for mineral extraction and may become fragmented in the future. Should these areas be developed, and associated road construction occur out to the coast, the yellow-billed loons in this area may be impacted. These mines also bring increased human activity and use of the area, which will disrupt this highly susceptible species. (See human disturbance discussion below.)

b. Canada

The yellow-billed loons' breeding grounds in Canada are also threatened from oil and gas and associated development. For example, seismic exploration has occurred on the east portion of Banks Island and future development in this area is possible. The Creswell Bay on Somerset Island (Nunavut) and Bathurst Inlet are two other areas where oil, gas and mineral development is being considered. Oil and gas development is also under consideration for many areas of Canada's coast. Currently, the Canadian government is considering construction of a gas pipeline through the Mackenzie Valley that has the potential to change the wilderness nature of much of the Northwest Territories. The Pipeline will cut an extensive corridor along almost the entire north-south length of the territory, and will lead to associated oil-and-gas activity and access to previously remote areas along the route. Barr (1997) found: "Industrial development [in Canadian yellow-billed loon breeding habitat] might be disastrous." Large numbers of Yellow-billed loons stage during the spring in open-water off the northern coast of Canada and are therefore susceptible to oil spills (Alexander et al. 1997).

c. Eurasia

Russian populations of the yellow-billed loon have been reported only on the Chukchi and Taimyr Peninsulas, however they have been spotted migrated through other portions of Russia as well. Breeding in the later appears to be confined to the Krasnoyarsk Territory, one of Russia's richest areas for natural resources. The area is rich in coal, iron, nickel, nepheline, magnesite and graphite and is one of the leading mineral-producing

regions in Russia (Mamanov 2001). About 16 percent of the coal mined in Russia, 24 percent of the lead, 70 percent of the copper, 75 percent of the cobalt, 80 percent of the nickel and nearly 100 percent of the platinum group metals, are produced in the region (Id.) Krasnoyarsk is also one of the leading gold-mining regions in Russia. (Id.) The result is that large portions of the region in the past, present and future will be developed for mining, including extremely destructive open-pit mining.

Mining operations in Russia have been recognized as potential causes of significant long-term environmental impacts as a result of poor design, improper implementation, and lack of public oversight. An investigation of the Kubaka Gold Mine in the Russian Far East revealed numerous problems including: poor disclosure of design modifications, poor baseline data for critical precipitation models, seepage and slope settlement at tailings impoundments, cyanide-contamination, and lack of effective reclamation plans well after the mine was operational (Edlund et al 1998). While this mine does not occur within the yellow-billed loons range, it is a vivid example of the fact that mining operations in Russia receive little oversight, and enforcement of environmental regulations is spotty at best. The current and continued growth of mining operations in this region may pose serious risks to the yellow-billed loon and its habitat.

Oil and gas is also a growing industry in the Krasnoyarsk region. Twenty-five oil and gas deposits have been located in the region and exploitation of a major oil province located in the south of the Evenkiya Autonomous District and in the Lower Angara River Region just recently began. (Id.) Barr (pers. comm. with J. Fair) speculates that yellow-billed loons are suffering declines in Russia due to oil spills and unenforced environmental protection there. (More than 10 million metric tons of oil, equivalent to 300 Exxon Valdez oil spills, are "lost" there annually [Barr 1997].) This risk will continue to grow as more areas are explored and developed for oil and gas. Additional plans to develop oil and gas deposits on the eastern shore of Kamchatka and in the Chukotka Region also threaten the yellow-billed loon.

It also appears that the yellow-billed loon may be killed through incidental by-catch in fishing nets in Russian waters including those around Uel'kal and other Chukotka villages. However, no documentation exists to determine the extent of the problem.

2. Non-breeders in summer months

Yellow-billed loons have regularly been documented offshore of the breeding grounds in both Canada and Alaska. Little is know about this population, but it is likely that these are non-breeding adults perhaps some adults that may have a territory on nearby land, and are making trips to the marine waters. Furthermore, most immature, and perhaps some non-breeding adults, are thought to remain on the wintering grounds during the summer. The documentation of these non-breeders, in some cases heavily concentrated, emphasizes the importance of the marine environment for this species. Of particular concern for the marine based population is the risk of an oil spill or other chemical contamination associated with near-shore or offshore oil and gas development. As

discussed in the section regarding "other natural or manmade factors affecting the yellow-billed loon" infra, this species is highly sensitive to toxics.

3. Wintering and Migration Route

To date, very little is known about the yellow-billed loons' wintering habitat or migratory pathways outside the United States. It is believed that the Central Canadian population of loons may migrate overland and winter in nearshore marine waters from Kodiak Island through Prince William Sound, and throughout Southeast Alaska and British Columbia. If the recent hypotheses regarding a yellow-billed loon overland migration route between Alaskan wintering areas and mainland Canada breeding grounds are proven true, oil spills or other catastrophes in south Alaskan marine environments, such as occurred with the T/V Exxon Valdez oil spill, could reduce Canadian populations (North 1990).

This species is know to occur irregularly southwest of Kodiak Island, along the Aleutian chain, and along the coast of Washington to Baja California. The Alaskan arctic and western Canada breeding populations are thought to travel a coastal route to winter in Asia. These Asian wintering areas are heavily used by commercial and subsistence fisheries and as oil transportation corridors. While little is know about habitat preferences or requirements of this species on its wintering grounds, it does appear that yellow-billed loons tend to occur nearshore in waters protected by bays or archipelagos, and from 50-61 degrees N (North 1994), areas where oil spills and marine pollution are more likely. Further, since yellow-billed loons spend their first three years, and thereafter approximately 8 months a year, in marine environments nearshore, the health of the marine environment is essential to the health of the species.

The risks of yellow-billed loons encountering marine pollution along the migration route and in the wintering areas are significant. For example, the world's largest energy project is an oil and gas development around the Russian Island of Sakhalin which borders Japan. The Sakhalin Project, which came on-line in 1984, is expanding into a second larger phase. The Sakhalin II projects includes the construction of two 800 km oil and gas pipelines running across Sakhalin Island, four undersea pipelines, two new oil and gas platforms in the north of Sakhalin and a liquid natural gas plant. The Sakhalin area is volatile, with tsunamis, severe ice shears and high seismic activity meaning the risk of a large oil spill is great. Oil and gas from the Sakhalin II project will be transported across the Okhotsk and Japanese Seas. Project planning efforts to date do not include the necessary precautions to prevent a catastrophic oil spill offshore of Sakhalin Island nor ensure that quick, effective response measures will be implemented in case of such spill. Based on the tracked movements of Alaska arctic breeders (Schmutz 2004) it appears that the yellow-billed loon migrates through this area and therefore may be exposed to risks associated with the Sakhalin and other similar projects.

Scientists have been raising serious concerns in recent years regarding threats to the Yellow Sea and the life that depends upon it. Approximately 600 million people (about 10% of the world's population) live in the river catchments draining into the Yellow Sea (UNDP 2000a in Barter 2002). The rapid human and industrial growth in the region has resulted in serious environmental problems for the Yellow Sea including loss of coastal

and wetland habitats, and marine degradation due to pollution from industrial, agricultural and domestic sources (Barter 2002). Major pollutants in the Yellow Sea include oil, inorganic phosphorous, inorganic nitrogen and heavy metals (Yuan *et al.* 2001; Moores *et al.* 2001 in Barter 2002). In fact, the highest heavy metal pollution levels in the world have been measured in Jinzhou Bay, an internationally important area for shorebirds in northern Liaodong Wan (ADB 2000 in Barter 2002). In some areas of the Yellow Sea more than 25% of samples taken had average oil pollution levels above the Chinese national standard of 0.05 mg L-1 maximum. (Id.) Further, long-term monitoring in China shows that seawater quality is steadily deteriorating (Yuan *et al.* 2001in Barter 2002). The Yellow Sea is also experiencing a growth in oil and gas development including the construction of four large oil fields in the Bo Hai, (which accounted for 24% of national production in 1996) (ADB 2000b) and facilities in internationally recognized important bird areas including Huang He NNR, Tianjin Municipality, Linghekou and Shuangtaizihekou NNR.

There is also great concern that the benthic fauna in the Yellow Sea is being seriously depleted from human over-harvest and decreased benthic productivity is likely due to massive pollution from many sources, declining upland river flows and sedimentation. These changes have the potential to result in ecosystem changes that may impact food sources for the yellow-billed loon and stress them as they prepare for their northern migration.

Unsustainable fishing also plagues the Yellow Sea region. For this reason the possibility of yellow-billed loons wintering in the area and getting caught in, and killed by, fishing nets is great, however no documentation exists regarding the extent of such by-catch. Clearly yellow-billed loons wintering in the Yellow Sea face numerous threats.

B. OVER-UTILIZATION FOR COMMERCIAL, RECREATIONAL, SCIENTIFIC, OR EDUCATIONAL PURPOSES

The yellow-billed loon does not appear to be impacted by over-utilization for commercial recreational, scientific or educational purposes. Some evidence exists that this species may experience nest disturbance associated with research efforts. Efforts should be made to design research to be the least intrusive and disturbing as possible. The impacts from such research appear to be minor and are not likely a threat to the continued existence of this species. Furthermore, these efforts contribute to a greater understanding of this species, which is of key importance if we hope to help in its long-term survival.

C. DISEASE OR PREDATION

One case of Aspergillosis was reported in a yellow-billed loon from California in 1975 (Remsen and Binford 1975), but disease does not appear to be a risk to this species. Yellow-billed loons are at risk from a number of nest predators, which in combination with the loons' already low fecundity has the potential to have population wide effects.

Recent evidence indicates that by increasing food sources, oil and gas and other development is resulting in increases in a number of predators that could feed on yellow-billed loon eggs and yellow-billed loons. In addition to food supplies, oil-field structures have increased the presence of some predators, such the raven, by supplying shelter and nest sites. It is unknown how many yellow-billed loons are lost to predation by avian and mammalian predators each year while on the nest, when away from nests during the breeding season, during migration and on the wintering ground. The recently completed National Science Council (2003) report regarding the cumulative impact of oil and gas development on the North Slope found the following in relation to an increase in predators on Alaska's North Slope:

Inadequate disposal of garbage has resulted in artificially high densities of gulls, ravens, and mammalian predators in the oil fields. The resulting increased predation of birds' nests and young has likely made some oil field populations dependant on immigration from more productive populations elsewhere. That is, nesting areas that might have been source habitats have become sink habitats.

Predators of yellow-billed loon nests and broods include glaucous gulls (North and Ryan 1988), parasitic jaegers (Johnson et al. 1998) and arctic foxes (*Alopex lagopus*) (Barr 1997). Egg loss was the primary factor reducing productivity on the Colville River Delta 1983-1984 (North 1986). Thirteen years later Earnst (pers. comm. with J. Fair) reported a significant decline in productivity, largely related to brood loss (chick mortality). A late thaw may have affected chick survival due to late nesting; however, changes in predator populations and their feeding strategies may also be involved.

D. THE INADEQUACY OF EXISTING REGULATORY MECHANISMS

The yellow-billed loon faces a formidable list of threats, many of which could be ameliorated or eliminated by regulatory actions. Thus far, no state, federal, or international laws or programs are in place that are adequate to address the threats currently faced by the yellow-billed loon. Although, the USGS, the USFWS, and others have recognized the yellow-billed loon as a species of concern, none of these classifications provides any legal protection for the species, and no other regulatory mechanisms are in place to protect the yellow-billed loon or its habitat.

Because the yellow-billed loon range and migrations crosses international borders, the opportunity to work with our neighboring countries to protect this species exists. For example, the Framework for Cooperation between the U.S. Department of the Interior and Environment Canada in the Protection and Recovery of Wild Species at Risk (1997) has as its primary goal "to prevent populations of wild species shared by the U.S. and Canada from becoming extinct as a consequence of human activity, through the conservation of wildlife populations and the ecosystems on which they depend" (Environment Canada et al 2001; Moe 2002). Unfortunately, the yellow-billed loon is not listed on the Framework's schedule of species and has not been recognized to date by any other agreements between the U.S. and its neighbors in Canada or Russia.

1. United Sates

a. State of Alaska

The Alaska Department of Fish and Game has not given any special protection to the yellow-billed loon, nor does it monitor the status of this species. In Alaska, the yellow-billed loon is a non-game species with protection under ADF&G regulations governing sport hunting. Rather than focusing efforts to protect this sensitive species, the State of Alaska is currently doing all it can to actively promote oil, gas, mineral and other development across the yellow-billed loons' range including expediting oil drilling through tax breaks and reduced permit requirements.

b. Federal

i. Migratory Bird Treaty Act

In 1918, the Migratory Bird Treaty Act (MBTA) (16 U.S.C. §§ 703-712, July 3, 1918) was signed, making it unlawful to hunt or kill any migratory bird or take their nest or eggs in the U.S. and Canada. The MBTA provided protection from commercial hunting of the yellow-billed loon. It is important to recognize that this Act does not provide any protection for breeding or other habitat of the yellow-billed loon in either the United States or Canada and it only extends to loons within 3 miles (4.8 km) of the coast.

ii. National Environmental Policy Act

The BLM has had many opportunities to protect important yellow-billed loon habitat, but has consistently failed to meet the task. The oil and gas development that has occurred within the yellow-billed loons' range to date has included no specific stipulations to protect this species and often ignores the sensitivity of this species in analyzing project impacts as required by the National Environmental Protection Act (NEPA).

Recent NEPA documents are inadequate and superficial in their treatment of yellow-billed loons and the potential impacts on this species. In documents such as the BLM's 1998 NE NPR-A EIS, Minerals Management Service's (MMS) Sale 144 Environmental Impact Statement and the Alpine Development Project Environmental Evaluation Document, and the Alpine Satellite Development Project, no reference is made to the species' low Alaskan and worldwide populations, low productivity and re-colonization rates, or high vulnerability to human disturbance and to the effects of development in key habitat areas. See (MMS 1996; ARCO 1997)

Although there is sizeable yellow-billed loon habitat use within NPR-A, it is rarely mentioned in the 1998 NE NPR-A EIS. The primary remarks regarding this species under Section III-B (Biological Resources) of the EIS appears largely erroneous. Section III-B-a. begins by implying that the yellow-billed loon is "in particular" 1 of 15 "fairly

common to abundant" breeding species of loons and waterfowl in the planning area. In the following paragraph, however, yellow-billed loons are reported as "uncommon breeders." Following that is an erroneous statement that the NE NPR-A (24% of the population survey area) appears more important to this species than the rest of the coastal plain because 27% of the surveyed population occurs within the former. However, Table III.B.4-3 (cited with this statement) reflects 24% of the population surveyed in the planning area. The data, taken directly from the most recent FWS surveys were the best data available.

These two errors are not so egregious standing alone, but reflect a lack of attention to and understanding of the species. No mention is made of productivity rates or their importance to evaluating the health and stability of yellow-billed loon populations (where annual adult population survey numbers may suffice for similar assessment of waterfowl populations). Were the low numbers, low productivity, and vulnerability of yellow-billed loons recognized and treated correctly in NPR-A EIS, predicted effects on this species from industrial exploration and development would have been reported, e.g., the effects of oil spills in the Colville River (North [1994] specifically described the extensive use made by yellow-billed loons of the tidal river habitat there). The Colville River Delta supports a small but important breeding concentration of yellow-billed loons, and the most studied population of the species on earth. Yet the NPR-A EIS lumps yellow-billed loons with waterfowl despite important and critical differences in population dynamics and ecological vulnerabilities that require different considerations.

Figure III.B.4-3 of the NE NPR-A EIS illustrates 7 yellow-billed loon breeding concentration areas with surveyed densities > 0.57 birds/sq. km. All EIS alternatives that included areas within NPR-A for development also included from 5 to 7 of these 7 critical areas. Yet the EIS suggests no special accommodations for this species. Had yellow-billed loons been recognized as a vulnerable species, key breeding areas would have merited identification and special protections from potential developmental activities and other human disturbances. Although a few of the sources reporting the vulnerability and desired conservation of yellow-billed loons were published after the original drafting of NPR-A EIS, most of the literature summarized within these later sources (and within this petition) were available to BLM prior to 1998.

Like the 1998 NPR-A EIS, the Beaufort Sea Planning Area Oil And Gas Lease Sale 144: Final EIS (MMS 1996) lacks information about and consideration of yellow-billed loons, and therefore reaches erroneous conclusions about effects. For example, in section IV-B-19 of the 1996 MMS EIS, predicted impacts of a coastal spill are deemed "low" for loons because "they do not congregate in flocks offshore." Yet, North (1994) reports extensive use of near shore marine habitats in the Beaufort Sea by yellow-billed loons, and states that the species is a "regular coastal migrant" in the area. Barr (1997) also discusses the importance of open-water leads in the area to yellow-billed loons migrating in the spring. Timson (1976 in Barr 1997) reported 50,000 loons (all species) funneling past Barrow during fall migration. The 1996 MMS EIS apparently overlooks > 4 months of use per annum of this area by yellow-billed loons. In another example, Figure III.B-3, illustrating "bird colonies," failed to illustrate the yellow-billed nesting concentration on

the Colville River Delta, which would potentially be affected by a spill reaching tidal zones that are used extensively by this species (North 1994).

Discussions of environmental impacts from human-caused disturbance should formally recognize the vulnerability and distinction of the yellow-billed loon as a species. Based on its high vulnerability, low numbers, low productivity, value as a high trophic level indicator species, and ecology very different than the waterfowl species with which it is so often lumped in EIS's, the yellow-billed loon certainly merits much more attention by conservation agencies, full consideration and separate discussion in NEPA documents relating to any of the species' habitat, and all resultant conservation and monitoring efforts.

Cumulative impacts (both additive and synergistic) must be assessed for this species, using geographic (ecosystem) approaches. A piecemeal approach–such as that used in the 1998 NPR-A EIS and the recent Alpine Satellite Development Project, inevitably will miss potential impacts; evaluating impacts across the Alaskan arctic coastal plain will be necessary, as will prescribing conservation measures across the species' range. Yellow-billed loon numbers are too low and widespread for a piecemeal treatment to provide effective consideration or conservation. A broad assessment, as would occur in the development of a species recovery plan under an ESA listing, would be more interpretive, provide for more effective conservation and avoidance of endangerment, and be more cost effective in the long term.

iii. Naval Petroleum Reserves Production Act

Oil and gas development is rapidly expanding across important yellow-billed loon habitat. Under the Naval Petroleum Reserves Production Act (NPRPA), the Secretary of the Interior "shall assume all responsibilities for any activities related to the protection of environmental, fish and wildlife, and historical or scenic values" (42 U.S.C. § 6503(b)). In addition, the Secretary is authorized to "promulgate such rules and regulations as he deems necessary and appropriate for the protection of such values within the reserve" (42 U.S.C. § 6503(b)). BLM attempts to comply with this requirement in large part by creating a series of conditions and restrictions that should, or might, be included on leases that are issued for oil and gas development. These discretionary restrictions are subject to political whim. Nowhere is this more apparent than in the significant weakening of stipulations designed to protect wildlife resources between the 1998 NE-NPRA plan and the recently adopted plan for the NW-NPRA. The latter is almost completely void of such stipulations and the ones in place are discretionary and unenforceable. Further, the fact that BLM is considering lifting restrictions in place under the NE-NPRA for the Alpine Satellite Project demonstrate that the stipulations offer nothing in the way of guaranteed protection. In summary, planning activities for oil and gas leasing within the NPRA have repeatedly failed to protect (either through closures or through disturbance minimizing stipulations) high-density areas or areas of known or suitable nesting and brood-rearing lakes for the yellow-billed loon.

iv. Oil Pollution Act of 1990

Requiring the use of double-hulled tankers for transport could reduce the risk of oil spills within the U.S. marine environment that is important to the yellow-billed loon. The Oil Pollution Act of 1990 (33 U.S.C. §§2701-2719) requires that single-hulled tankers be phased out of the U.S. Fleet by 2015. To date, some major oil companies, including Exxon, have yet to replace any single-hulled tankers in their fleet. An analysis of the average age of the U.S. fleet shows that an oil spill is actually more likely to occur today than in 1989. Clearly the Oil Pollution Act has as yet been inadequate to protect the yellow-billed loon from the threat of oil spills.

2. Canada

Canada has several regulatory mechanisms that could afford protection to the yellow-billed loon, however, the failure to recognize the yellow-billed loon as a sensitive or at-risk species has resulted in no special protection for this taxon. The yellow-billed loon is not protected by CITES, and the species and its habitat receive no other special legal protection in Canada.

a. Migratory Birds Convention Act

The yellow-billed loon is protected in Canada under the Migratory Birds Convention Act, but subsistence hunting is allowed by constitutionally defined rights of aboriginal peoples, and not specified further by regulations. No data is available to determine the subsistence harvest levels of this species in Canada.

Some of the yellow-billed loons' range in Canada is within Migratory Bird Sanctuaries (MBS). While MBS do protect migratory birds against physical disturbances such as hunting, many other activities are allowed within the sanctuaries that may negatively impact migratory birds and their habitat. Further, MBSs can be privately owned, provincial, territorial or federal lands and therefore receive various levels of protection and enforcement. Lastly, much of the range of this species is outside MBS's so they offer no protection to the species across its range in Canada.

b. Canadian Environmental Assessment Act

The Canadian Environmental Assessment Act, similar to the NEPA in the US, requires federal departments, agencies, and crown corporations to conduct environmental assessments for proposed projects where the federal government is the proponent. It also requires environmental assessments when the project involves federal funding, permit, or license. This Act only went into effect in 1999 and therefore is still in its infancy and not considered highly effective yet. The Act also does not apply to private or aboriginal lands of which comprise a great portion of yellow-billed loon habitat in Canada. Furthermore, the ecological needs and vulnerability of the yellow-billed loons in relation to such analyses have gone largely unnoticed.

c. Canada Wildlife Act

Another means by which Canada could help protect the yellow-billed loon is through the Canada Wildlife Act. The Act grants the Canadian Wildlife Service and Environment Canada discretionary authority to promote public cooperation in wildlife conservation and interpretation, initiate and conduct wildlife research, establish advisory committees, and coordinate and implement wildlife policies and programs in cooperation with the provinces. R.S. 1985, c. W-9, s. 3 (a-e). The Act also allows the Minister to purchase, acquire or lease any land or interests therein for the purpose of conservation. This includes land important for migratory bird habitat. (Id. at s. 9.) In theory the Act could provide protection for the yellow-billed loon. In practice however a non-game species such as the loon is not regulated under the Act unless they receive an "at risk" designation. Canada has not recognized the yellow-billed loon as "at risk" and therefore receives no protection under the Act.

d. National Accord for the Protection of Species at Risk

In 1996, the National Accord for the Protection of Species at Risk was signed. The Accord establishes a mechanism for cooperation among the various governments in Canada by committing the Ministers to develop complementary legislation, regulations, policies, and programs to ensure that endangered species are protected throughout Canada. The Accord does not have specific substantive effect (Moe 2002). Further, since the yellow-billed loon has not been recognized as an endangered species in Canada, the Accord offers no protection for this species.

e. Habitat Stewardship Program for Species at Risk

The Habitat Stewardship Program for Species at Risk began in 2000 to promote locally controlled, public-private cooperation to restore and protect significant ecosystems. "The goal of the Habitat Stewardship Program is to contribute to the recovery and protection of habitat for priority listed species at risk, and for other species of special concern" (Environment Canada 2001). The yellow-billed loon received no protection under this program, as it has not been listed as a species at risk or concern in Canada.

f. Species at Risk Act

In June 2002 the Canadian Parliament Canada passed the Species at Risk Act (SARA). The Act is modeled in part after the ESA and will begin by addressing the list of species in Schedule 1 of the Act. The yellow-billed loon is not included in this list and therefore will receive no protection under this Act in the near future. While this legislation may help to fill an existing gap in protection for fragile species and their habitat, the Canadian Bar Association and many others believe the Act is much too narrow, that it fails to protect essential habitat outside of nesting or denning areas, and it inappropriately relies on discretion and political will for the implementation of the legislation (CBA 2001).

3. Russia

The change from a centrally planned economy to a market-oriented economic system in the newly independent republics of the former USSR without adequate environmental protections, has unfortunately led to deterioration in management in relation to wildlife conservation and endangered species. Some of the problems for wildlife protection include: increasing poaching; a decline in scientific establishment to argue for wildlife protection; lack of new law structure to emerge in the independent states; and the failure of many republics to sign independently international Conventions supported under the USSR system (Braden 1996).

The U.S. Migratory Bird Treaty with the former Soviet Union would protect yellow-billed loons across their Asian breeding range, if it were implemented and enforced, an unlikely occurrence in the near future due to political and economic conditions in the former Soviet Union.

4. Asia

There is concern about impacts from potential oil spills and marine pollution to the yellow-billed loon on its wintering grounds off the coasts of Russia, Japan, North Korea, and China. It appears that the yellow-billed loons that breed in Alaska winter in these areas. Some countries in Asia are party to the MARPOL Convention to prevent marine pollution. Despite this, little to no regulations are in effect on the ground in these countries to prevent such pollution or otherwise protect the marine environment of this species. Furthermore, serious concerns exist regarding over-fishing in these areas and the huge number of birds incidentally caught during fishing activities in these waters. It is unclear how over-fishing may impact the forage fish species of yellow-billed loons or to what extent if any this species is being caught in fishing nets. However, it is clear that no regulations are in place to address these issues.

E. OTHER NATURAL OR MANMADE FACTORS AFFECTING THE YELLOW-BILLED LOON

Several natural and human induced factors are likely impacting the yellow-billed loon. The threats facing this species are particularly troublesome because of their interrelated nature. The effects of these threats are synergistic, indicating that addressing each threat independently will not be sufficient to preserve the population. Impacts of habitat modification and predation cannot be viewed without consideration of low population numbers, low productivity, extreme sensitivity to disturbance, and vulnerability to toxic contamination. Each of these factors is described in detail below, however such factors should not be viewed as exclusive of one another.

1. Small Population Size and Low Productivity

The FWS must consider the small global population of this species in and of itself. There is general agreement among conservation biologists that small population size per se constitutes an important risk of extinction because of a number of deterministic and stochastic factors of demography and population genetics. These factors include demographic stochasticity, environmental stochasticity, Allee effects, inbreeding depression, reduced genetic variability and loss of adaptive potential in gene frequencies, and fixation of new deleterious genetic mutations. All of these stochastic effects create survival risks, especially for small populations like the yellow-billed loon.

Populations reduced below a certain number of individuals through disease, habitat loss, habitat degradation, and other factors face a high probability of extinction (Franklin 1980, Gilpin and Soulé 1986, Soulé 1987). Small populations are subject to inbreeding, a loss of genetic variability, random changes in phenotype, loss of heterozygosity, and genetic drift (Primack 1993). Genetic inbreeding ultimately results in decreased fitness and survivorship (Lacy 1987). Small populations can also lose genetic variability through the loss of rare alleles and the percentage of heterozygous genes (Avise 1994).

Low populations size can produce imbalances in sex and age ratios, low fecundity, and high mortality rates. Collectively these demographics vary at random, but in small populations they have a greater chance of resulting in extinction even when survival and reproductive success are high (Gilpin and Soule 1986). In addition to demographic fluctuations, small populations can experience rapid decline in numbers and local extinction caused by variation in disease, food supply, predation, competition, and other environmental factors (Primack 1993). Isolated populations are more vulnerable to extinction caused by catastrophic events and a reduced gene flow (Noss and Cooperider 1994). The extinction risk for the yellow-billed loon is elevated by direct, indirect and cumulative impacts from current and future oil and gas development across essential breeding habitat in Alaska.

Furthermore, because Alaskan yellow-billed loon breeders are concentrated within NPR-A between Meade and Colville Rivers, and are clumped in concentrated breeding spots (see Figure 4), marine feeding habitats, and pre-migratory gathering areas, they are exceptionally vulnerable to adverse impacts from catastrophic events including major storms and oil spills. Indeed, these factors can interact in a dire feedback cycle by which a small population spirals to extinction. These factors are primary among the central principles of conservation biology, and the FWS must consider them in its decision whether to list the species.

The North American population of yellow-billed loons is speculatively estimated at 11,000 individuals (Fair 2002), making this species one of the rarest species of waterbirds that breed regularly within mainland North America. Worldwide population is estimated as low as 16,650.(Id.)

Yellow-billed loons are highly vulnerable to environmental change and disturbance and exhibit a lower annual productivity rate than most waterfowl. In fact, all species of loons exhibit low productivity rates (McIntyre 1988; North 1986) and slow re-colonization of

breeding habitat, both factors which may limit population growth (or recovery). Yellow-billed loons exhibit the highest annual variation in productivity among loons, due to the timing of spring ice-melt and late summer freeze-up in their high latitude breeding habitat. This leaves a briefer window of open water for nesting, incubation and chick fledging (believed longer than fledging periods of Pacific and red-throated loons) (Earnst 2000a), thereby rendering low productivity rates as a more significant limiting factor for this species. Nestling hatch dates for yellow-billed loons on the Colville River Delta are 5-10 days later on years with late ice-melt (Earnst unpubl. data), and appear linked to significantly lower productivity rates. Depending on their breeding range, most loon species can re-nest subsequent to 1 or more early season nest failures, but the brief open-water season in yellow-billed loon arctic breeding habitat greatly precludes successful production (fledged chicks) resulting from re-nesting.

When compared from year to year and prior to and after environmental changes, yellow-billed loon productivity, expressed as number of chicks fledged/nesting pair, may be the best and most important measure of loon population health. Declines in productivity may predate declines in recruitment and adult numbers by a decade due to longevity of individuals and territorial fidelity of breeding pairs. To date, yellow-billed loon productivity surveys have been confined to studies on the Colville River Delta. North and Ryan (1988) reported 1.29 and 0.94 chicks fledged/nesting pair there in 1983 and 1984 respectively. Low egg loss appeared to facilitate a higher productivity; loon chick mortality after hatch is generally low. Data reported by Johnson et al. (1999, 1998, 1997, 1996) suggest 0.35-1.25 juveniles (not yet fledged)/nesting pair in the Colville River Delta in 1995-1999, with all years after 1995 (the first year of the study during which not all nesting pairs were likely found) <0.65. Earnst (1998, pers. comm. with J. Fair) found 0.8-1.0 chicks fledged/nesting pair in 1995-6, but a drastic reduction to <0.2 chicks fledged/nesting pair in 1997, primarily due to brood mortality, which may be related to shorter nesting or brooding seasons caused by late ice-out or early freeze-up on breeding lakes.

Nesting frequency (percent of a population of territorial loon pairs that actually nests in a given year) is a factor of loon productivity and subsequent recruitment, and is often overlooked by general surveys. Nesting frequency may be adversely impacted by human disturbance caused by researchers, other human traffic, and development, and by loon population dynamics (e.g., newly formed common loon pairs are less likely than experienced pairs to nest [D. Evers pers. comm. with J. Fair]). Data on nesting frequency, like data on productivity, become available only through more intensive studies of loon populations; to date, data for yellow-billed loon nesting frequencies are confined to Colville River Delta studies. Smith's et al.(1994) data suggests a yellow-billed loon nesting frequency of 71% in 1993. Field's et al. (1993) data suggest levels of 42% in 1989 and 76% and 77% in 1983-4. It appears that significant variability exists in the number of loon pairs that lay eggs in any given year. This variability in nesting frequency may make this species vulnerable to factors such as season-length and anthropogenic effects.

The low reproductive potential of yellow-billed loons means that the population may have trouble recovering quickly, if at all, to disturbance. Loons as a genus are widely recognized as vulnerable and susceptible to human disturbance and development. Yellow-billed loons appear extremely sensitive and vulnerable to disturbance in the vicinity of their nests and broods (e.g., Barr 1997, North 1994, Barr, North pers. comm. with J. Fair). Yellow-billed loons may be vulnerable, as are common loons (Fair unpubl. data), to low nesting frequency rates. According to limited field evidence (e.g., Field et al. 1993), environmental or other disturbance factors may affect yellow-billed loon nesting frequency and productivity. Because yellow-billed loons exhibit high fidelity to certain nesting areas, they may continue to nest in areas near disturbances even if such nesting suffers continual failure. In other words, disturbances may not lead to different nesting choices, but may lead to productivity declines.

Human disturbance and development are also likely causes of productivity and population decline where humans encroach on yellow-billed loon nesting habitat. Potential mechanisms for human impacts include disturbance by terrestrial and air traffic (see discussion of oil and gas impacts below), nest failure due to lake or pond drawdown, toxic contamination, effects of vegetation disruption on permafrost and subsequently on breeding lakes, and intrusive research/observation techniques (Barr 1997, North 1994, Gabrielson and Lincoln 1959). Increased human disturbance of nest sites may draw incubating adults away from clutches, facilitating higher rates of egg predation. Both scenarios are reported across North America for common loons where human development or visitation occurs.

2. Oil and Gas Activity

Yellow-billed loons are extremely sensitive, more than most waterfowl species, to the multiple and cumulative effects of oil exploration and development (Barr 1997, North 1994). Oil exploration, drilling, and pipeline development could potentially affect a significant portion of a population, already small and under heavy environmental pressures. Barr (1997) explains, "the establishment of oil wells, pumping stations, pipelines, mines, roads or other development in or through breeding habitat has the potential to degrade or destroy this limited resource . . .. Also, the present balance of successful reproduction with natural predation could be destroyed by increased human disturbance during sensitive periods on the breeding range." Because the yellow-billed loon exhibits low population numbers and low productivity, any small additional (cumulative) effect on the breeding grounds may be sufficient to cause declines.

In March 2003, the National Science Council published a report assessing the cumulative impacts of 50 years of oil development on Alaska's North Slope. This report reveals that there are serious cumulative impacts caused by industrial development and that these effects are continuing to accumulate. Specifically, they reported, "reproductive success rate of some bird species in the developed parts of oil fields has been reduced to the extent that it is insufficient to balance mortality" (NRC 2003).

a. Habitat Fragmentation and Disturbance

Habitat destruction and modification in relation to oil and gas development are addressed in section VI (A) above.

b. Vulnerability to Oil Spills and other Chemical Contamination

An additional potential impact from oil and gas development is the risk of oil or chemical contamination. Yellow-billed loons are highly susceptible to oil spills on breeding grounds, wintering grounds, migration paths, and staging and feeding areas adjacent to river mouths along the Beaufort coast of Alaska (Derksen et al. 1981, North and Ryan 1986, Barr 1997) and near summer aggregates of non-breeders (Barr 1997). King and Sanger (1979) rated this species twenty-ninth most vulnerable of 176 avian species that use the northeastern Pacific, with an oil vulnerability index rating at 65 of 100. Despite attempts to control such spills, as long as oil and gas production continues on the North Slope, it is not possible to totally eliminate the risk of a major spill, nor is it possible to ensure rapid containment and clean up under all weather conditions. Potential sources of a spill include, but are not limited to, a drilling blowout, failure of diesel fuel storage tanks, and spills from barges or trucks used to transport fuel oil to exploratory and delineation rigs. An oil spill could affect loons on nesting and brood rearing lakes and ponds, on rivers and streams, and in the marine environment.

Oil spills may directly injure or kill birds or indirectly impact birds by contaminating nearby tundra ponds, causing significant damage to the ponds and the birds that use them (NSC 2003). Lethal effects are expected to result from moderate to heavy oiling of any birds contacted (BLM 2004). After contact, oil can kill birds by causing the feathers to lose their ability to insulate, which leads to hypothermia, and through toxicological effects after ingestion. Birds are particularly susceptible to oil because it coats their feathers, destroying their insulating properties that may result in hypothermia, or drowning due to loss of buoyancy. Oil may also be ingested from the preening of oiled feathers or from oil-contaminated food. For these reasons survival of oiled birds is typically poor. Further, birds that come into contact with oil may impact numerous reproductive risks. Even small amounts of oil transferred to birds' eggs by incubating adults are typically fatal to the embryos inside (Audubon Alaska 2001). Oil contaminated eggs have significantly less hatching success (BLM 1998).

Loons are among the diving bird species which may be particularly susceptible to oil spill mortality, because they spend more time resting on the water and are likely to resurface in oil when they dive for food and to escape disturbance, including oil (King and Sanger 1979). The greater risk of food contamination is at the shoreline where loons are often found. Ingestion of oil, by adults during feeding or preening may reduce reproductive success and cause pathological conditions, liver/endocrine damage, reduced nestling growth, etc (BLM 1998). Oil spills may also have long-term affects on ponds by reducing invertebrate prey and emergent vegetation, thereby reducing food availability and escape cover. (Id). Oil spills are also documented to kill fish, the primary food source of yellow-billed loons.

In its analysis for the NE NPR-A planning process, BLM estimated that 20%-35% of crude-oil spills will occur on or reach the tundra surrounding gravel pads (BLM 1988). The spills most likely to result in damage are those that enter a river or waterbody. It is these same areas, areas with high interconnectivity among waterbodies and river channels, preferred by yellow-billed loons for breeding. Furthermore, the BLM recognized that possible contamination of the Colville River and its tributaries (an area of great importance as a long-term study area for yellow-billed loons) to be one of the greatest risks associated with oil and gas development. Despite this, BLM is moving ahead with leasing in large portions of this area. (Id.)

The yellow-billed loon may also be vulnerable to oil spills in the marine environment off the breeding grounds. If an oil spill were to occur in the marine waters near an important breeding concentration or on the tundra and reach marine waters, it could have significant effects on that segment of the breeding population. Furthermore, given the very small breeding size of yellow-billed loons, the impact of coastal oil spills becomes that much greater.

The risks of oil spills in relation to development on Alaska's North Slope are not merely speculative. According to the Alaska Department of Environmental Conservation (ADEC), the Prudhoe Bay oil fields and Trans-Alaska Pipeline have caused an average of 423 spills annually on the North Slope since 1996. Between 1996 and 2002, more than 2,150 spills occurred, totaling more than 1.7 million gallons of toxic substances, most commonly diesel, crude oil, and hydraulic oil (ADEC 2002). In April 2001, a spill released more than 92,000 gallons of crude oil and salt water onto the tundra in the Kuparuk oil field. In May 2003, 1,500 gallons of crude oil and about 4,500 gallons of produced water (which flows out of the oil wells along with the crude) were spilled by a British Petroleum operation in Prudhoe Bay. Cleanup of oil spilled on Alaska's North Slope is often limited by ice and weather and can often be delayed or hindered up to 6 months. Recovery rates of spilled oil are traditionally very low even when cleanup is not hampered by weather conditions. Recovery rates of 20-25% are considered high and are often expected to be zero.

In its recent analysis for then NW NPRA, the BLM estimates 130 small crude oil spills (averaging 3bbl), 323 small spills (averaging 29 gal each) and 1 large spill (500-900bbl) will occur over the life of the project (BLM 2003). The chance of one or more spills over 500 bbl over the life of the Planning Area is 38% (BLM 2003). Of course impacts to the yellow-billed loon from such a spill would depend upon the spill location and volume, weather and other conditions that may aid in the spread of the oil, whether the species was present in the vicinity of the spill, and the time that oil persists in the environment. However, given the small population of yellow-billed loons in Alaska, one large spill that occurred at a time and location where yellow-billed loons were relatively densely populated could be devastating for the survival of the Alaska breeding population.

Because the yellow-billed loon is a long-lived piscivore, it is highly sensitive to toxins accumulated in aquatic systems (Audubon Alaska 2003). King and Sanger (1979) ranked

yellow-billed loons the highest of all loon species in an Oil Vulnerability Index (OVI) for birds using Northeastern Pacific marine habitats. Yellow-billed loons were the 29th most vulnerable of 176 species ranked, with an OVI rating of 65 (100 = max.). Coastal lagoons and tidal zones, which are used by the yellow-billed loon, are highly vulnerable to oil pollution. An oil spill (e.g., from a ruptured pipeline at a river crossing, a supply barge accident, etc) that reached coastal lagoons and nearshore marine waters could cause serious harm to this species at the population level. This species would also be potentially affected by a spill that reached tidal zones or coastal marine habitat on the wintering grounds where juveniles reside for 2-3 years before acquiring adult plumage. Oil spills on land may contaminate breeding lakes and adversely affect necessary food fish for loons; oil spills in the marine environment, such as in the Alaska Beaufort Sea and in the wintering areas in the Gulf of Alaska south to Baja or on the Asian coast, may affect marine feeding habitat, migrating loons, or summer non-breeding adults.

c. Increased predation

While the yellow-billed loon does have some natural predators, it is clear that human activities are likely to increase predation on the yellow-billed loon. Anthropogenic food sources, concomitant with new or increased human presence, attract scavenging predators and may enhance both avian and mammalian predator populations. The result is an increase of yellow-billed loon egg and chick predation. This is discussed in detail in the "predation and disease" section VI(C) supra.

d. Nest and other disturbance

Loons as a genus are widely recognized as vulnerable and susceptible to human disturbance and development. Yellow-billed loons appear extremely sensitive and vulnerable to disturbance in the vicinity of their nests and broods (e.g., Barr 1997, North 1994, Barr, North pers. comm. with J. Fair). Anthropogenic noise may provide interference and cause territorial disruption leading to reproductive failure.

Oil and gas and its associated development are often highly disruptive to birds. When disturbed by humans, adults often flee the nest, exposing the eggs to predators and risking separation from their chicks. While there is no data available regarding exact distances which human disturbance may impact yellow-billed loons, parents have been reported to leave the nest when an observer is as much as 1.6 km (1 mile) away or as visible.

One such disturbance factor resulting from oil and gas and its associated development is highly disruptive aerial traffic. Noise associated with aerial traffic may displace adults and/or broods from preferred habitats during pre-nesting, nesting, brood rearing and migration. Females may also be displaced from nests leaving eggs exposed or young susceptible to predation or bad weather. Noise disturbance may also reduce foraging efficiency and feeding time for the yellow-billed loon. Most oil and gas projects rely on fixed-wing aircraft or helicopters to support activities associated with development such as the transport of people, supplies, and equipment for fieldwork. Surveyors, hydrologists, and biologists all often perform their work via aerial surveys and air access

is often used for construction and maintenance activities. Light helicopters are commonly used, and medium helicopters and fixed-wing planes are occasionally used. Helicopters normally fly low and slow and are often used year-round during oil production operations. Fixed-wing aircraft usually fly higher and faster. Almost all aircraft activity occurs in the summer months when loons are most likely to be impacted.

In the planning analysis for the Northeastern planning area of the NPR-A, it was recognized that many flights would occur over waterfowl habitat areas in the lake areas to the north, west, and east of Teshekpuk Lake. This area has some of the highest recorded yellow-billed loon densities in the western Arctic (USDOI 1998). The frequency of these flights is often underestimated, and promises to mitigate impacts to birds are often broken. For example, in developing the Alpine project the industry made claims that flights would be restricted during a 6 week nesting period and that only 13 flights a month were expected during both construction and production (Miller 2003; Arco 1997). In reality, between June 1 and July 15, 2000, 1,980 airplane and helicopter take-offs and landings occurred at Alpine – an average of 44 per day during the bird-nesting season (Johnson et al 2001). Substantial aircraft traffic has also resulted from the planning and development of the Northstar offshore oil project. During the initial construction and installation of the production buildings period, BP planned up to 4,960 one-way flights between Deadhorse and the Northstar Island during construction (US Army Corps. 1999; See also Miller 2003). More than 2,200 flight trips were planned between April and August, the time most likely to disrupt birds that are nesting, brood-rearing and molting. An additional 2,300 one-way flights were planned for the Northstar project from late August to November, which also overlaps with the fall migratory staging period.

The construction of roads and access routes for oil and gas and other development may also result in noise disturbance from vehicular traffic and increase access routes for all-terrain vehicles to remote areas of the tundra. While behavioral response of yellow-billed loons to aircraft and other noise is anecdotal to date, they are thought to be highly vulnerable to disturbance. Given the extremely low populations of yellow-billed loon it is likely that increased disturbances associated with oil and gas development may be impacting this species.

Lastly, eggs are also exposed to greater threat of predation when industrial water withdrawals occur at nesting lakes during the incubation period. This water depletion or drawdown requires adults to make longer change-overs due to the struggle across land, between water and the nest. The result is an increase period when the nest is unprotected. Water Depletion is discussed in detail infra.

e. Water Depletion

Oil and gas development may also indirectly impact the yellow-billed loon through water depletion or drawdown. Modern oil exploration and development techniques make extensive use in winter of ice roads, drilling pads and airstrips. These roads melt during the summer, supposedly leaving little trace. Ice roads may compact lake ice, and increase lake ice depth, and thus delay melt (BLM 1998a). Since the yellow-billed loon needs

sufficient open water for landing and taking off, such roads may indirectly impact this species. On average, ice roads require 1.0 to 1.5 million gallons per mile of road, over tens of miles distance (USDOI 1998). In the central Arctic oil fields, the industry is permitted to draw down up to 15% of the under-ice volume of water in individual water bodies (lakes, ponds, lagoons etc). This 15% limit is intended to conserve fish, but its scientific basis is uncertain. Winter extraction of water or ice from arctic waters could change the chemistry of those waters (USDOI 1998). For example, pumping water from a freezing lake would remove the more saline and more alkaline water from under the lake ice. During snowmelt, less saline, less alkaline runoff water replaces removed waters (Id.). The DEIS for the NW- NPRA estimates 424 million gallons of water will be needed, taken from 130 lakes, each winter under the Alternative A, the alternative recently adopted in the ROD (BLM 2003).

Water drawdown during the nesting/brooding season, or water refill after winter drawdown, may reduce nesting success. Water depletion may cause nests to be stranded away from water resulting in nest abandonment or predation during incubation. Due to shoreline nesting requirements, water level must remain stable throughout yellow-billed loons' nest inception and incubation. Water-level fluctuation during nesting period may cause nest failure, either flooding the nest or stranding adults from it. Further, flooding due to blocked or inadequately maintained drainage may result in flooded nests. Winter drawdowns might conceivably cause later spring refills, flooding nests after normal phenological initiation. Any drawdown that lengthens the time for nesting changeovers would open the eggs to greater potential of predation.

The yellow-billed loon establishes breeding territories before the Arctic is free of snow and ice. Ice roads, water withdrawals, and gravel pads and roads could affect water levels on nesting lakes. Even a slight decrease in water levels could make yellow-billed loon shoreline nesting habitat unusable for nesting.

3. Marine Pollution and Structure Changes

The yellow-billed loon is at risk from oil spills or other chemical contamination on its breeding grounds, and in their wintering habitat as well. Given that yellow-billed loons spend approximately eight months each year exclusively in marine environments, this species may be highly vulnerable to marine contaminants and toxics. Because this species tends to prefer near-shore areas including protected bays and archipelagos, it is more likely to come into contact with marine pollution. Furthermore, this species, like other loons is susceptible to contaminants because of its top position in the food chain. There is growing concern regarding a general pattern of decline among northern-breeding diving ducks and other marine birds (including the Red-throated loon). While these declines are poorly understood, contaminants or a change in the structure of marine communities are suspected. The health of the marine ecosystem may have substantial effects on population health of this and other marine dependant species. These changes may be small, but may have long-term cumulative impacts on this species. Furthermore, while it is possible that such changes may be impacting the yellow-billed loon, it is likely

that the effects on adult health and mortality would not yet be detected by current population survey efforts.

4. Incidental by-catch from Fishing

In general loons are known to be susceptible to by-catch, entanglement and accidental drowning, in near-shore gillnets. In Alaska, most commercial near-shore gillnet fishing occurs between April and September (peaking in June and July). During this time, most yellow-billed loons are on the breeding grounds in northern Alaska, but many immatures (on the wintering grounds) and some non-breeding adults remain in the marine environment. It is possible that some yellow-billed loons may be taken during this time as well as during the winter commercial gillnet season in Alaska or eastern Asia. No information is available at this time to assess whether this species is indeed being caught in gillnets and how extensive the problem may be. Alaska's commercial longline, pot, and trawl fisheries occur from September to April on the wintering grounds of the Yellow-billed loon. Because these fisheries occur offshore, they are unlikely to result in a take of Yellow-billed loons.

Subsistence fishing occurs simultaneously with the yellow-billed loons' breeding season on the Alaska's North Slope, making it a potential cause for concern. Some areas near large rivers (such as the Meade River and Colville River) where yellow-billed loons frequently fish, potentially overlap subsistence fishing spots. Neither the ADF&G, nor the USFWS, currently monitors by-catch from subsistence fisheries and therefore no information exists to determine if this is a problem. It also appears that incidental by-catch from fishing is a potentially serious problem in Russia and Eurasia as well.

5. Hunting

In 1918 the Migratory Bird Treaty Act (MBTA) (16 U.S.C. §§ 703-712, July 3, 1918) was signed, making it unlawful to hunt or kill any migratory bird or take their nest or eggs in the U.S. and Canada. The MBTA provided protection from commercial hunting of the yellow-billed loon. However, harvest of migratory birds by indigenous inhabitants for subsistence purposes is still legal in Alaska and Canada. While there was historically a technical closure on the spring subsistence season in Alaska, the policy was openly not enforced and subsistence hunting continued over the years.

In 2003 the USFWS in conjunction with the Alaska Migratory Bird Co-Management Council adopted regulations that legalized the spring/summer subsistence hunt in Alaska for 2003. In its rulemaking, the USFWS specifically recognized that the yellow-billed loon was a species of special concern because of its relative low abundance and limited distribution. (See 68 Fed. Reg. 43024 [2003]). However, the final 2003 rule did not specifically list the yellow-billed loon as closed or open to subsistence harvest. (Id.) Species that are not specifically listed as open to harvest are technically closed, however the USFWS maintains that it has prosecutorial discretion on whether or not it will enforce the closure of these species. In the past USFWS has used this discretion and chosen to

only enforce the closure on species specifically listed as closed to subsistence take. Because the yellow-billed loon has not been given a high priority in FWS enforcement policy, illegal subsistence harvest will likely continue to be tolerated. The proposed rules regulating the 2004 spring/summer subsistence harvest make no specific mention of the yellow-billed loon and therefore leave them in this uncertain state. 69 Fed. Reg 1686 (2004).

Limited data are available through the USFWS Subsistence Migratory Harvest Surveys regarding the take of birds and or their eggs for subsistence use. The majority of birds harvested for subsistence purposes are taken in the spring followed by the fall. The number of yellow-billed loons taken by geographic region varies greatly. It does not appear that yellow-billed loons are specifically targeted for subsistence needs, however a lack of accurate data makes the situation difficult to assess.

An average of 207 yellow-billed loons per year were reported taken in Alaska as part of the subsistence harvest from 1987 through 2000, but loon species identification is in question, North Slope harvests are poorly monitored, and therefore numbers are considered highly inaccurate (Georgette, Wentworth pers. comms. with J. Fair). Projected sample survey data indicate nearly 200 yellow-billed loons harvested on St. Lawrence Island, where nesting and migrating yellow-billed loons occur, though the projections may be in question (Joel Schmutz, USGS, pers. comm. with J. Fair).

Eggs of the yellow-billed loon are generally not collected. Between 1995 and 2000, only 18 eggs were reported taken on average annually for this species in all areas surveyed. Fourteen of these were taken from the Yukon-Kuskokwim Delta, and 4 from the Togiak National Wildlife Refuge (USFWS 2003). During this same time, a total of 157 birds were taken on average each year from all areas for which information was available. The geographic areas with the highest harvest levels again were the Yukon-Kuskokwim Delta (74) and the Togiak National Wildlife Refuge (43) (Id.). It must be kept in mind that this data is likely inaccurate. For example, the reports of large harvests of this species from the Yukon-Kuskokwim Delta and Togiak National Wildlife Refuge are particularly troublesome because Yellow-billed loons do not breed in these areas and are thought to be relatively uncommon migrants. Prior to 2002-03, the survey forms used were black and white perhaps making it difficult to distinguish this species from other more common loon species perhaps resulting in under or overreporting. New color forms will hopefully improve accuracy of this data. The problem is further compounded by the lack of a known Yup'ik name for this species. Lastly, most subsistence harvest of this species is likely to occur on Alaska's North Slope, where the species is more common during summer months, but little harvest data is available for the North Slope villages. Due to the difficulty with the species identification forms and the limited harvest surveys available for Alaska's North Slope, it is impossible to determine the impact, if any, subsistence harvest may be having on Alaska's population of Yellow-billed loons at this time.

The yellow-billed loon is protected in Canada under the MBTA and there is no hunting season in the regulations. This species is hunted for subsistence throughout its range by

Native hunters, allowed by constitutionally defined rights of aboriginal peoples, and may be a regular source of food in a few regions (reviewed in Barr 1997).

The U.S. Migratory Bird Treaty with the former Soviet Union would protect yellow-billed loons across their Asian breeding range, if it were implemented and enforced, an unlikely occurrence in the near future due to political and economic conditions in the former Soviet Union. Hunting regulations for at least some of the Soviet republics, e.g., the Yakutian Republic 1962-1981 (Perfilev 1987), restricted or completely prohibited the taking of yellow-billed loons. For the former Soviet Union, however, current reports of regulation or enforcement efforts are difficult to acquire.

VII. CRITICAL HABITAT SHOULD BE DESIGNATED FOR THE YELLOW-BILLED LOON

The Secretary shall designate critical habitat concurrent with determination that a species in endangered or threatened as required by the ESA (16 U.S.C. 1533(a)(3A))

Critical habitat is defined by Section 3 of the ESA as:

> (i) the specific areas within the geographical area occupied by the species, at the time it is listed in accordance with the provisions of section 1533 of this title, on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection; and (ii) specific areas outside the geographical area occupied by the species at the time it is listed in accordance with the provisions of section 1533 of this title, upon a determination by the Secretary that such areas are essential for the conservation of the species. 16 U.S.C. §1532(5).

The designation and protection of critical habitat is one of the primary ways to achieve the fundamental purpose of the ESA, "to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved," (16 U.S.C. §1531(b)). In adding the critical habitat provision to the ESA, Congress clearly saw that species-based conservation efforts must be augmented with habitat-based measures:

"It is the Committee's view that classifying a species as endangered or threatened is only the first step in insuring its survival. Of equal or more importance is the determination of the habitat necessary for that species' continued existence . . . If the protection of endangered and threatened species depends in large measure on the preservation of the species' habitat, then the ultimate effectiveness of the Endangered Species Act will depend on the designation of critical habitat." (House Committee on Merchant Marine and Fisheries, H.R. Rep. No. 887, 94th Cong. 2nd Sess. At 3 (1976))

The yellow-billed loon will benefit from the designation of critical habitat in all of the ways described above. The added layer of protection provided by critical habitat will

allow the FWS to designate reasonable and prudent alternatives to activities that are impeding recovery but not necessarily causing immediate jeopardy to the continued survival of the species. This is particularly important as oil and gas activity continues to expand across this species breeding range. For these reasons we request critical habitat designation concurrent with species listing.

VIII. CONCLUSION

A species must be listed as endangered under the ESA if it "is in danger of extinction throughout all or a significant portion of its range," 16 U.S.C. § 1532(6) (emphasis added), and as threatened if it is "likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range." 16 U.S.C. § 1532(20) (emphasis added). A species may also be listed on the ESA as a DPS if it is determined discreet and significant.

As outlined in detail above, the yellow-billed loon clearly meets the criteria for listing as threatened or endangered under the ESA. Petitioners strongly believe that protection for this species is best provided by listing of the global population as threatened or endangered under the ESA. Should the Service decide that listing of the global population is not warranted, it is clear that listing of the Alaska breeding population is warranted. Yellow-billed loons that breed in Alaska are the only breeding population within the jurisdiction of the United States. As a result of their low numbers and restricted breeding range, and the imminent industrial development within their core habitat areas in NPR-A, the Alaska breeding population is at risk from natural and human-caused factors. Major storms, oil-spills and other catastrophic events as well as predation, inhibited reproductive success and disturbance could severely deplete yellow-billed loon numbers in the United States and lead to extirpation of this population. Such extirpation would clearly result in a significant gap in the species range

Population numbers for the yellow-billed loon are dangerously low and therefore extremely vulnerable to any additional negative effects including those from industrial development. An estimated 3,650 birds occur on the Alaskan breeding grounds (Fair 2002). The North American population of yellow-billed loons is estimated at 11,650 individuals, and the worldwide population is estimated as low as 16,650. (Id.) It is clear that several factors acting cumulatively including the restricted range, small population size, low productivity, specific habitat requirements and high vulnerability, combined with the multitude of looming threats facing this species' breeding and wintering habitat, put the future of this species' viability at risk.

Substantial scientific information has been presented to warrant the petition and prove the endangered or threatened status of the yellow-billed loon. ESA listing of the yellow-billed loon along with designation of critical habitat is essential to ensure the future survival of the species.

PROCESSING OF THIS PETITION

This petition is submitted under the provisions of the ESA, 16 U.S.C. §§1531 et seq., 50 C.F.R. 424.14, and the APA, 5 U.S.C. §533. As a petition to list a species as endangered or threatened, FWS is bound to process this petition within a predetermined time frame as defined by CFR 424.14(b) to the maximum extent practicable. The regulations require FWS to make a finding within 90 days of receipt of this petition as to whether a finding of 'endangered' or 'threatened' may be warranted. The finding shall be promptly published in the Federal Register. 50 CFR 424.14(b)(1). Within 12 months of receiving this petition, FWS is required to find that this petition is not warranted, is warranted, or warranted but precluded, and shall promptly publish notice of such intention in the Federal Register. 50 CFR 424.14(b)(3). The Center for Biological Diversity et al. fully expects this petition will be carefully considered and that FWS will comply with these mandatory deadlines.

IV. SIGNATURES

Respectfully submitted this 30th day of March, 2004.

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On behalf of:

Natural Resource Defense Council
Pacific Environment
Trustees for Alaska
Interregional Public Charitable Organization of Far Eastern Resource Centers "ISAR"
Kaira Club
Kronotsky Nature Preserve
Taiga Rangers
Kamchatka Branch of Pacific Institute of Geography-(Far East Department of Russian Academy of Sciences)
Kamchatka League of Independent Experts
Wild Nature of Sakhalin

X. BIBLIOGRAPHY OF LITERATURE CITED

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