

THE ALASKA LOON WORKING GROUP

PROJECT DIRECTORY

A description of current loon and grebe monitoring, research, and education projects

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Compiled by

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Region 7, Migratory Bird Management
Nongame Migratory Bird Branch

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INTRODUCTION

The Alaska Loon Working Group is a collection of biologists, managers, and enthusiasts interested in working together to elevate the status of loons in Alaska. The Working Group was first convened in December 1997 and has met annually (see Appendix for minutes of the 1997, 1998, and 1999 meetings). The goals of the Alaska Loon Working Group are to:

- Facilitate exchange of information among biologists, managers, and the public
- Identify conservation and management issues faced by Alaska's loons
- Review and identify gaps in knowledge of loon distribution, status, and ecology
- Facilitate collaborative projects among agencies and others.

The Project Directory of the Alaska Loon Working Group provides a brief summary of ongoing, recently completed, and planned projects on loons and grebes throughout the state. Its purpose is to facilitate communication among project contacts and with the general public. The Project Directory includes a Bibliography of Loons in Alaska (see Appendix B) which lists over 100 references, both published and unpublished, on loons and grebe ecology or distribution in Alaska or northern Canada and Russia.

The Project Directory consists of summaries of 24 projects; 20 focus on research and monitoring and 4 focus on education and public outreach. Table 1 is an overview of parameters estimated in the research and monitoring projects, and Figure 1 illustrates the geographic distribution of those projects. Most studies (13/20) provide an estimate of relative abundance and distribution across part or all of the species' breeding grounds in Alaska. Several studies (7/20) also provide some measure of productivity, usually number of broods per pair or unit area during late summer. A few studies (n = 5) investigate one or more components of reproductive success (clutch size, nesting success, and brood-rearing success), 5 investigate adult survival and/or contaminant exposure, and 5 investigate wintering distribution and trends. One of the latter studies (Project 16) investigates the potential impact of the *Exxon Valdez* Oil Spill on loons wintering in the Prince William Sound. In addition to the parameters listed in Table 1, various measures of habitat associations can be derived from most studies, and habitat selection at the within-territory and landscape scales is a focus of 2 projects (Project 11 and 13). In general, more projects provide information on the more abundant Pacific, Red-throated, and Common Loons (n = 11, 10, and 9, respectively) than on the less abundant Yellow-billed Loon (n = 5). In addition, Red-necked and/or Horned Grebe distribution and abundance is addressed in 10 projects (Projects 1, 2, 3, 5, 6, 10, 14, 15, 16, and 17); including one on the effects of human disturbance on distribution and reproductive success (Project 5), and four on wintering distribution (Projects 14-17).

A summary of our current state of knowledge on the status of Alaska's loon populations is provided in *The Status of Loons in Alaska -- A Preliminary Needs Assessment* by Brian McCaffery (reprinted here on pages vi-xi). The document highlights gaps in our knowledge and identifies conservation and management issues important to Alaska loons. Every project summarized in this Directory addresses one or more of the identified gaps in knowledge. It is our hope that background provided by the *Preliminary Needs Assessment*, data provided by ongoing and future projects, and further initiatives of the Alaska Loon Working Group will provide the synergy necessary to address the conservation issues that face Alaska loons.

Table 1. Parameters estimated in research and monitoring projects on Yellow-billed (Y), Pacific (P), Red-throated (R), and Common Loons (C) reviewed in the Project Directory. Project Numbers refer to page number of project's summary (see Table of Contents).

Region	Site	Proj. No.	Abundance/ Distribution	Components of Repro. Success ^a	Productivity	Adult Survival	Contaminant Exposure	Wintering Distribution
STATEWIDE		1	P,R,C					
		2	Y,P,R,C					
		20					Y,P,R,C	
SOUTH-CENTRAL	Mat-Su/Anch./Kenai	3	P,R,C		P,R,C			
	Mat-Su Valley	4	P	P	P			
	Mat-Su Valley	5	C	C	C			
	Mat-Su Valley/Kenai	18				R,C	R,C	
	SE Alaska/Kodiak	15,17						Y,P,R,C
	Prince William Sound	16					Y,P,R,C	Y,P,R,C
	Wintering Sites	14						Y,P,R,C
WESTERN	Natl. Guard Sites	6	P,R,C					
	Yukon-Kusk. Delta	7	P,R	P,R				
	Yukon-Kusk. Delta	8	R	R	R	R	R	R
INTERIOR/ NORTH SLOPE	Yukon Flats NWR	9	P C					
	Tetlin NWR	10,19	P		P	P	P	
	Colville River Delta	11	Y,P,R	Y,P,R	Y,P,R			
	Colville River Delta	12	Y		Y			
	Natl. Petroleum Res.	13	Y					

^a Projects listed in this column measure all components of reproductive success (i.e., clutch size, nesting success, and brood-rearing success) except Project 7 which measures only clutch size. Projects under Productivity give a final measure of productivity such as number of young per successful pair in late summer.

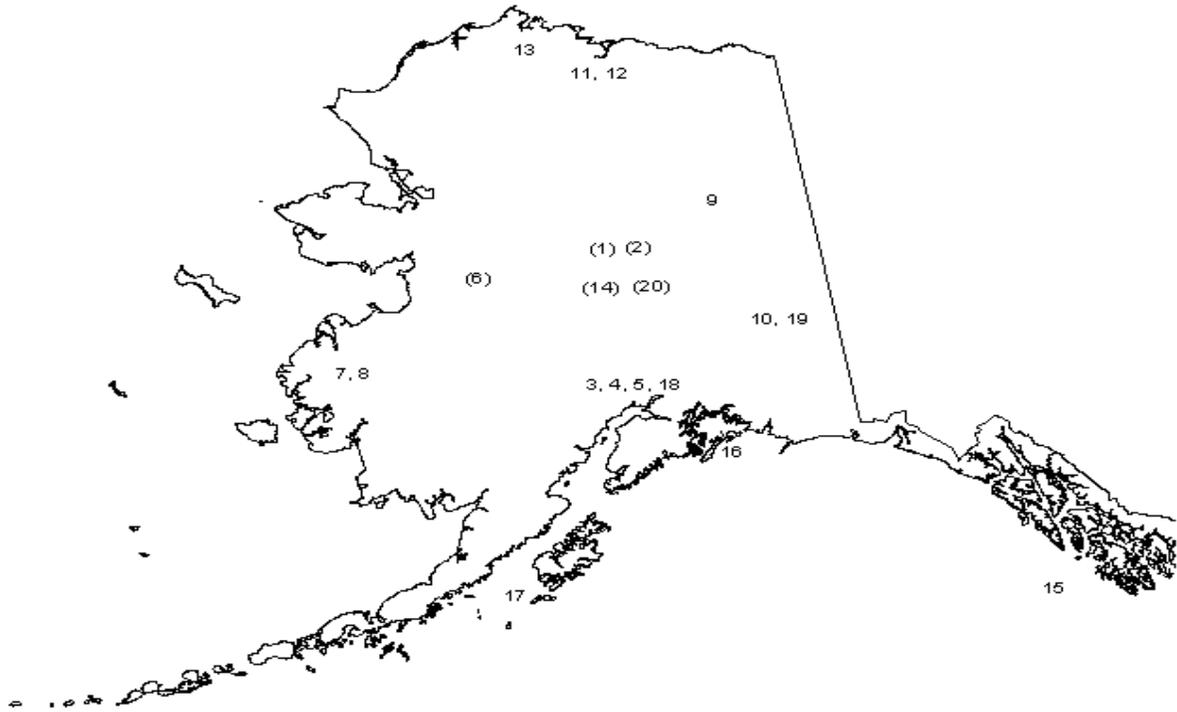


Figure 1. Loon research and monitoring projects in Alaska. Numbers refer to Project Numbers given in the Table of Contents; numbers in parentheses refer to projects that cover a large portion of the state.

The Status of Loons in Alaska — A Preliminary Needs Assessment

Prepared under the auspices of the Alaska Loon Working Group
March 1998

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Red-throated, Arctic, Pacific, Common, and Yellow-billed Loons nest in Alaska, and all but the Arctic Loon are regular and common breeders in at least some regions of the state. In fact, the number and diversity of loons in Alaska may be unmatched anywhere in the world. Because of their evocative calls and association with wilderness, loons generate a romantic mystique that extends interest in their welfare beyond that of conservation biologists. Despite this widespread appeal and their potential importance as indicators of environmental health, the status of loons in Alaska is not well understood. Information is fragmentary, relatively limited, and has not been widely disseminated.

To improve this situation, and in response to documented declines in some Alaskan loon populations, the Alaska Loon Working Group held its first meeting on 5 December 1997. Convened by Brad Andres (U. S. Fish and Wildlife Service, Migratory Bird Management, Alaska) and Dave Evers (BioDiversity, Inc., Freeport, Maine), the meeting attracted more than 25 loon biologists and enthusiasts that represented a wide range of interests, including federal and state governments, non-government organizations, consulting firms, industry, and private citizens. For the first time, information and insights about Alaska's loons were shared in a common forum. Investigators presented data on Alaska loon populations, and the conservation implications of their findings were discussed by the group. The Working Group decided to first produce a Preliminary Needs Assessment to review population status and information needs, and to later produce a Final Needs Assessment that would critically scrutinize available data, identify threats, and suggest research priorities.

This report represents the first phase of the Working Group's needs assessment. We briefly summarize current knowledge about the status of Alaska's loon populations, highlight major data gaps, and identify loon conservation and management issues. The conclusions about population trends presented here rely heavily on the work of pilot-biologists and observers who have flown aerial surveys for Migratory Bird Management, U. S. Fish and Wildlife Service. The

contribution of these individuals, both past and present, cannot be overestimated. Without their foresight, dedication, and skill, we would have no quantitative basis for addressing loon conservation in Alaska. In the following species accounts, significant trends are based on simple linear regressions with a significance level of 5%, unless otherwise specified.

Red-throated Loon (*Gavia stellata*)

Red-throated Loons breed throughout the state (Armstrong 1995), and are most common in the tundra regions of western and northern Alaska (Gabrielson and Lincoln 1959). Populations appear to be stable on the North Slope (King and Brackney 1997) and in Alaska's boreal forest regions (Groves et al. 1996). The population inhabiting the western tundra, however, has declined significantly over the last 20 years. The decline, which is broadly distributed from Bristol Bay to Kotzebue Sound, is significant when all western tundra strata are pooled, and in each of the four individual strata in that region (Groves et al. 1996).

In the absence of additional data, it is difficult to generate hypotheses that explain the negative population trend. The decline of Red-throated Loons in Alaska has paralleled that of Oldsquaw — stable on the North Slope (King and Brackney 1997) and declining dramatically in western Alaska (Conant and Groves 1997). Whether declines in these two populations share a common cause is unclear.

Arctic Loon (*Gavia arctica*)

Formerly considered conspecific, Arctic and Pacific Loons were recognized as separate species in 1985 (American Ornithologists' Union 1985); they are distinguished by a suite of subtle structural and plumage characteristics (Birch and Lee 1997). Arctic Loons in Alaska are extremely rare, locally distributed, and comprise only a tiny fraction of the species' global population. The species breeds regularly from northern Europe to northeast Siberia (American Ornithologists' Union 1983) but is only a locally rare breeder on Alaska's western Seward Peninsula (Kessel 1989). Arctic Loons are casual spring migrants and summer visitants at other coastal locations on the peninsula (Kessel 1989), and they may be a very rare, but regular, spring migrant past Gambell on St. Lawrence Island (Dunn and Rose 1992). Because Alaska's Arctic Loons are at the very fringe of the species' range, they are not discussed further in this document.

Pacific Loon (*Gavia pacifica*)

Pacific Loons breed in all regions of Alaska except the southeast (Armstrong 1995). Aerial survey data reveal no significant negative trends anywhere in the state (Groves et al. 1996, King and Brackney 1997). This overall picture of stability is contradicted, however, by several site-specific breeding studies. On Tetlin National Wildlife Refuge, in the eastern interior, there was an apparent decline in both overall Pacific Loon numbers and productivity from 1989 to 1995 (T. J. Doyle, U. S. Fish Wildl. Serv., pers. commun.). Similarly, the number of nests and

the number of juveniles fledged seem to be declining in the Matanuska-Susitna Valley (Fair 1998). The most dramatic apparent decline has occurred along the coastal fringe of the Yukon-Kuskokwim Delta, where, from 1989 to 1997, the number of loon nests discovered by ground crews has declined at an annual rate of 21%, based on log-linear regression (Bowman et al. 1997). These data from the Yukon-Kuskokwim Delta, however, are not supported by aerial surveys conducted in the same area over the same interval, which indicate modest increases in Pacific Loon numbers (R. Platte, U. S. Fish Wildl. Serv., pers. commun.).

The discrepancy between the aerial survey data and the local declines based on ground work is not easily explained. With long-lived birds such as loons, the proportion of birds breeding and/or their breeding success could decrease for many years without a corresponding decrease in overall population size. Whether or not breeding success is declining in Pacific Loons in Alaska remains to be determined. Our inability to draw even tentative conclusions about the status of Pacific Loons highlights the limits of our understanding of loon population dynamics.

Common Loon (*Gavia immer*)

Common Loons breed throughout the state but are relatively less common in tundra habitats than their smaller congeners (Armstrong 1995, Gabrielson and Lincoln 1959). Overall, Common Loon populations appear to be stable across Alaska. There is no significant trend either statewide or in the boreal forest strata (Groves et al. 1996). In the tundra strata (which support 40% of the state's Common Loons), however, there is evidence for a slight decline ($P < 0.1$) over the last 20 years (Groves et al. 1996).

There is concern about the susceptibility of Common Loons to human development and recreational disturbance in south-central Alaska, particularly since the area in and immediately adjacent to the survey stratum supporting the greatest number of boreal forest loons (Kenai-Susitna) also supports most of Alaska's human population.

Yellow-billed Loon (*Gavia adamsii*)

In Alaska, Yellow-billed Loons breed only from the Seward Peninsula north, with most pairs nesting north of the Arctic Circle (North 1994). The bulk of the state's population (and a significant fraction of the species' global population) occurs on the arctic coastal plain (North 1994). Aerial surveys on the arctic coastal plain documented a slight, but significant, population increase between 1986-1997 (King and Brackney 1997). Numbers detected on surveys flown specifically for eiders in the same area between 1992-1997, however, remained relatively stable (Larned and Balogh 1997).

Trend data notwithstanding, the absolute size of the Yellow-billed Loon population is cause for concern. At most, only several thousand of these rare birds nest in Alaska (North 1994), and most are concentrated in a fairly limited zone within the National Petroleum Reserve -

Alaska (NPR-A) between the Meade and Colville rivers (Brackney and King 1995). Dense concentrations of Yellow-billed Loons south of Teshekpuk Lake are within an area that is currently being considered for oil and gas leasing under at least three of five leasing alternatives (Bureau of Land Management 1997). The potential effects of oil development, habitat loss, and increased disturbance on this species are unknown. Yellow-billed Loons on the arctic coastal plain may also be vulnerable to subsistence hunters and incidental mortality from entanglement in gill nets.

General Conclusions

There is cause for concern about Alaska's breeding loons. Each of the three widely-distributed species has suffered either local or regional declines over the last two decades, and the fourth species (Yellow-billed Loon) is vulnerable due to its small population size and limited geographic range. With the exception of aerial survey data, our knowledge about Alaska's loons is relatively shallow and fragmentary. Few site-specific studies of breeding biology have been undertaken, and it is unclear to what extent results can be extrapolated across the species' ranges. Our understanding of loon distribution and ecology away from the breeding grounds is even poorer. Several major gaps common to all four species include information on:

- 1) demographic parameters (e.g., productivity, survival, age of first breeding),
- 2) wintering distribution, including concentration areas and timing of use,
- 3) use of the marine environment during breeding and non-breeding seasons,
- 4) anthropogenic effects on loon survival and productivity (e.g., recreation, research, energy development, subsistence, incidental take in gill nets, and exposure to contaminants),
- 5) detailed survey data on species that are rare (e.g., Yellow-billed Loon) or that occur in areas presently or potentially exposed to high levels of human disturbance (e.g., Matanuska-Susitna Valley, NPR-A),
- 6) data on habitat use, availability, and quality in relation to loon abundance and productivity,
- 7) relationships between loon population trends and the status of fish stocks in both the breeding and wintering areas,
- 8) patterns of recolonization after population declines or extirpation, and
- 9) data on population trends in Canada, especially for Yellow-billed Loons, that would enable us to interpret Alaska data in a rangewide context.

Improving our understanding of loon biology, however, is only part of the loon conservation equation. Any successful conservation effort should include public education; the potential for using loons in an Alaskan education program is enormous. The diversity, abundance, and aesthetic appeal of loons in Alaska provide a unique educational opportunity to promote the conservation of loons, wetlands, and wildlife in general. The Anchorage Audubon Society holds a very popular Loon Festival each year and the North American Loon Fund has published posters and booklets that highlight Alaska's loons. Both programs are important steps in building public support for loon conservation.

Elsewhere in North America, active conservation efforts have been required to maintain or restore loon populations suffering from anthropogenically-caused declines in reproductive success. A number of specific management techniques have been developed and successfully implemented (Warheit et al. 1997, McIntyre 1995). Although active restoration is not needed for most loon populations in Alaska, these efforts have demonstrated that, with enough information, active loon management can be both practical and effective.

Encouraged by successes elsewhere, the Alaska Loon Working Group recognizes the need to synthesize and distribute information about Alaska's loons. At the same time, the Working Group wants to promote the collection of additional data necessary for devising constructive management strategies. To these ends, the Alaska Loon Working Group is currently compiling a loon project directory, has instituted an e-mail list to improve communication among members, and will be producing a detailed needs assessment later in 1998. We look forward to increased collaboration with our Canadian colleagues, and we encourage them, particularly those involved in aerial waterfowl surveys, to record loon observations as a standard part of their survey protocols. We hope that these preliminary steps will help educators, managers, biologists, and other concerned citizens to more effectively promote loon conservation in Alaska.

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DISTRIBUTION, ABUNDANCE, AND TRENDS

LARGE-SCALE AERIAL SURVEYS

ALASKA-YUKON WATERFOWL BREEDING POPULATION SURVEY

Bruce Conant and Debbie Groves

Major breeding populations of ducks and other highly visible waterbirds in Alaska are surveyed annually to estimate population sizes and monitor population trends. The Alaska-Yukon Waterfowl Breeding Population Survey is conducted from mid-May to mid-June each year using strip-transect sampling from aircraft. The survey covers most of the major waterfowl summer habitats in Alaska. (Exceptions include the Pacific coastal habitats from the Aleutians to the southeast panhandle and the Arctic Coastal Plain.) Although the survey was designed primarily for ducks, other highly visible waterbirds such as loons and grebes are counted. Loons are identified to species except for Arctic Loons (*Gavia arctica*), which are lumped with Pacific Loons (*G. pacifica*). Grebes are not identified to species. The survey samples 1% (2,269 km²) of the survey area (206,682 km²) each year.

Years: 1971-1999; ongoing

Relevant Publications:

Conant, B. and D.J. Groves. 1997. Alaska-Yukon waterfowl breeding population survey, May 15 to June 14, 1997. Unpubl. Rep., U.S. Fish Wildl. Serv., Juneau, AK. 29pp.

Groves, D.J., B. Conant, R.J. King, J.I. Hodges, and J.G. King. 1996. Status and trends of loon populations summering in Alaska, 1971-1993. Condor 98:189-195.

Hodges, J.I., J.G. King, B. Conant, and H.A. Hanson. 1996. Aerial surveys of waterbirds in Alaska 1957-94: population trends and observer variability. National Biological Service Information and Technology Report 4. 24pp.

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AERIAL SURVEYS FOR DISTRIBUTION AND ABUNDANCE OF LOONS AND GREBES IN ALASKA

Bob Platte

Systematic aerial strip transects of 400m width have been flown on each of these areas during the years indicated to estimate the abundance of waterfowl including loons and grebes. Additionally, individual locations of all observations have been stored in a GIS database. Relative density maps for many species have been generated. Trends have been calculated for areas with ≥ 5 years of data. Data have been gathered in the following locations and years:

1989-1999 Yukon Delta
1986-1999 North Slope Breeding Pair Survey (flown by Rod King)
1992-1999 North Slope Eider Survey (flown by Bill Larned)
1989-1992 Yukon Flats
1993-1994 Bristol Bay
1994-1995 Innoko
1992-1993 West Coast of Alaska
1996-1997 Koyukuk
1996-1997 Selawik
1997 Kanuti

Relevant Publications:

Annual reports available from U.S. Fish and Wildlife Service, Migratory Bird Management, Waterfowl Management Branch, Anchorage.

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ABUNDANCE, TRENDS, AND BREEDING ECOLOGY
SOUTHCENTRAL ALASKA

ALASKA LOON WATCH

Nancy Tankersley Fair and Jeff Fair

Alaska Loon Watch is a loon monitoring program focused on southcentral Alaska, where 65% of Alaska's human population lives. Common, Pacific and Red-throated Loons breed on the numerous lakes and ponds of the Kenai Peninsula, Anchorage, and Matanuska-Susitna Valley. Anchorage is the largest city in North America to still have nesting loons. Concern about human and loon conflicts has led to related research and education efforts.

Up to 200 lakes have been monitored each year since 1985. The Alaska Department of Fish and Game coordinated the program from 1985-1996, using staff and up to 200 volunteers. In 1997 and 1998, the Valley Center for the Environment contracted for the volunteer management. A summary of Loon Watch information from 1985-1997 was compiled by Jeff Fair in 1997 and funded by Anchorage Audubon Society and the Matanuska-Susitna Valley Borough. Initial research in 1997 and 1998 by Jeff Fair on causes of apparent Pacific Loon declines, has been funded by Anchorage Audubon and North American Loon Fund. Loon Watch information includes names of lakes surveyed, dates observed, observer, number of adult and juvenile loons seen, species of loons, nesting attempts, nest location, and estimated chick survivorship. Some causes of nest failure or chick loss are recorded. Red-necked Grebes were also recorded in 1987, 1988, and 1989 on some lakes.

Years: 1985-1999; ongoing

Relevant Publications:

Fair, J. 1998. The status of loons in Anchorage and the lower Matanuska-Susitna Valley - A summary report of Alaska Loon Watch, 1985-1997. Unpubl. Rep. to Anchorage Audubon Society, the Matanuska-Susitna Borough, and Alaska Dept. Fish and Game. 40 pp.

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INVESTIGATIONS IN THE DECLINE IN POPULATION AND PRODUCTIVITY OF PACIFIC LOONS IN THE MATANUSKA-SUSITNA VALLEY OF ALASKA

Jeff Fair

Volunteer survey data from the Alaska Loon Watch Program during 1985-1997 indicated a marked reduction in nesting pairs and chick production of Pacific Loons in the Matanuska-Susitna Valley. The project described here utilizes a selected sample of water bodies and more intensive observations to confirm apparent declines and to investigate causes of declines and which points in the production cycle causative agents affect (e.g., adults not returning, pairs nesting but failing to hatch eggs, chick mortality, etc.).

Relevant Publications:

Fair, J. 1998. The status of loons in Anchorage and the lower Matanuska-Susitna Valley - A summary report of Alaska Loon Watch, 1985-1997. Unpubl. Rep. to Anchorage Audubon Society, the Matanuska-Susitna Borough, and Alaska Dept. Fish and Game. 40 pp.

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**EFFECTS OF HUMAN DISTURBANCE ON BREEDING SUCCESS OF
COMMON LOONS IN THE MATANUSKA-SUSITNA RIVER VALLEY
OF SOUTHCENTRAL ALASKA**

Tamara Mills

This research is designed to develop a better understanding of how human disturbance is related to loon and grebe breeding success and what potential threats may exist within this relationship. Specific objectives are: 1) to determine the current population and pair distribution of the Common Loon, and to compare these findings to studies from 1987, 2) to determine lake occupancy and productivity of the Common Loon and Red-necked Grebe in relation to the type and degree of human disturbance, 3) to examine current management techniques and develop recommendations to conserve the existing Common Loon and Red-necked Grebe populations.

Using a combination of aerial and on-water surveys, lake occupancy and productivity of loons and grebes will be assessed. The type and amount of human disturbance will also be documented. In addition, 156 lakes surveyed for loons in 1987 will be revisited in 1999 to ascertain any temporal changes in the population.

Years: 1998-1999; ongoing

Relevant Publications:

Fair, J.S. 1997. The status of loons in Anchorage and the lower Matanuska-Susitna Valley - A summary report of Alaska Loon Watch, 1985-1997. Unpubl. Rep. to Anchorage Audubon Society and Matanuska-Susitna Borough. 40 pp.

Riske, M. E. 1976. Environmental and human impacts upon grebes breeding in central Alberta. Ph.d. thesis. Calgary, Alberta.

Ruggles, A.K. 1991. Habitat selection by Common Loons (*Gavia immer*) in the Matanuska-Susitna Valley, Alaska. MS thesis. Univ. Alaska, Fairbanks.

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ABUNDANCE, TRENDS, AND BREEDING ECOLOGY
WESTERN ALASKA

BREEDING BIRD INVENTORIES OF ALASKA ARMY NATIONAL GUARD TRAINING AREAS

Brad Andres

Two-person crews collect standardized checklist data on 44 Alaska Army National Guard Training Areas in Western and Southwestern Alaska. Each training area is visited once, for four days, during the peak of the breeding season (10 June - 15 July). Observers record the breeding status (observed, possible, probable or confirmed breeders) of all species encountered in a training area. Breeding status designations follow recommendations of the North American Ornithological Atlas Committee. Categorical abundance of each species found in an area is assessed (rare, uncommon, fairly common, common, abundant). Observers attempt to survey all major habitats found in the training areas. Observers record the amount of effort expended in the area (person-hours) and delineate surveyed areas on topographic maps.

Percentage of sites where each species was found; n=44 sites

RTLO	45%
PALO	79%
ARLO	7%
COLO	32%
HOGR	16%
RNGR	68%

Years: 1995-1998

Relevant Publications:

Andres, B. A., D. L. Brann, and B.T. Browne. 1998. Inventory of Breeding Birds on Local Training Areas of the Alaska Army National Guard. Unpubl. Rep., U. S. Fish Wildl. Serv., Anchorage, AK. 104pp.

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YUKON DELTA NEST PLOTS

Tim Bowman

Nesting populations of waterfowl and loons are surveyed annually in the central Yukon Kuskokwim Delta. Plots are randomly selected throughout the Delta and are searched completely by 1-2 people. We record data on species, nest site, nest status, number of eggs, and stage of incubation. We encounter up to 50 total loon nests (Red-throated and Pacific) per year. Information is used to estimate size of the nesting population in the central coastal Yukon Delta.

Years: 1986-1999

Relevant Publications:

Bowman, T., R. Stehn, M. Wege, G. Walters. 1997. Population size and production of geese and eiders nesting on the Yukon-Kuskokwim Delta, Alaska in 1997. Unpubl. Rep., U.S. Fish Wildl. Serv, Office of Migratory Birds, Waterfowl Management, Anchorage, AK.

[Other annual field reports available from U.S. Fish and Wildlife Service, Migratory Bird Management, Waterfowl Management Branch, Anchorage]

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REPRODUCTIVE DEMOGRAPHICS, USE OF MARINE HABITATS, AND EXPOSURE TO CONTAMINANTS OF RED-THROATED LOONS BREEDING IN ALASKA

Joel A. Schmutz

I was recently awarded a small, one-year set of funds for the above-named project by the national headquarters of the Biological Resources Division - U.S. Geological Survey. There are 3 principal objectives for this project. First, my field crew and I will estimate nesting and chick-rearing success on the Yukon-Kuskokwim Delta (YKD). We will locate as many nesting Red-throated Loons as possible; the efficiency of our nest-searching efforts will be aided by several existing waterfowl research camps and aerial surveys. Once located, we will revisit the nesting or brood-rearing loons periodically. From these data, we can calculate daily survival rates for the nesting and brood-rearing periods and thus directly compare these demographic characteristics to those for loons from another study on the North Slope of Alaska.

A second objective is to capture as many loons as feasible, obtain blood samples, and run tests for exposure to contaminants - specifically heavy metals and organo-chlorines. Elevated contaminant levels have been documented in other waterbirds nesting on the YKD and has thus caused concern for Red-throated Loons. We intend to also sample another geographic area to provide a comparison to levels found on the YKD. We will thus capture Red-throated Loons on the Copper River Delta and similarly obtain blood samples and test for contaminants. In sum, we have budgeted for 25 screens for heavy metals and 12 for organo-chlorines.

A third objective is document use of marine habitats and the links between breeding and wintering areas. We will do this by placing satellite transmitters on a small number of the loons we capture for contaminants sampling (5 in each of the 2 geographic areas). We will use a subcutaneous transmitter, similar to that recently used on Common Loons. The timing of this particular objective may have to be delayed 1 year. The manufacturer of the satellite transmitters is presently unsure if they can produce the transmitters in time for deployment in 1999 (an unfortunate consequence of how long it takes the USGS-BRD national office to allocate funding - 6 months into the fiscal year). If so, we will purchase the satellite transmitters this year and deploy them in 2000. Because I won't have this same set of funds dedicated to Red-throated Loons in 2000, we anticipate that other on-going projects on the YKD and Copper River Delta will be able to provide the logistical and personnel costs of deploying these transmitters.

A final, tertiary objective is that I am currently discussing with the manager of the Yukon Delta National Wildlife Refuge about what methods to most effectively interview residents for documentation of loon bycatch. There is concern that subsistence fish nests capture and drown many loons.

Years: 1999 - ongoing

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ABUNDANCE, TRENDS, AND BREEDING ECOLOGY
INTERIOR AND NORTH SLOPE OF ALASKA

LOON ESTIMATION SURVEY ON THE YUKON FLATS

Mark Bertram and Mike Vivion

Surveys have indicated the Yukon Flats is an important breeding area for Pacific Loons (*Gavia pacifica*) and Common Loons (*G. immer*). Loons have been surveyed during waterfowl breeding pair surveys conducted by the Division of Migratory Birds since 1953 and the Yukon Flats Refuge since 1984. A comprehensive loon specific survey was conducted in 1988 and 1999. The results of the 1988 are referenced below. The 1999 survey estimated densities of Pacific and Common Loons at 0.80/km² (+/-0.33 at 0.90 CI) and 0.05/km² (+/-0.20 at 0.90 CI), respectively. The population estimate for the Yukon Flats Production Area was about 14,000 Pacific Loons, 1,000 Common Loons, and 1,000 unidentified loons. These results should be interpreted with caution due to high variance associated with the estimate. This survey is conducted annually in early June.

Years:

Breeding pair survey (Div. Migratory Birds) 1953 - ongoing annually
Breeding pair survey (Yukon Flats Refuge) 1984-1989, 1994, 1996
Loon Population Estimation Survey of Yukon Flats, 1988, 1999 - ongoing annually

Relevant Publications:

Bertram, M.R. and M.T. Vivion. 1999. 1999 Loon Survey in the Yukon Flats. Unpublished Rep., U.S. Fish and Wildl. Serv., Fairbanks, AK. 2pp.

Lanctot, R.B. and P.X. Quang. 1992. Density of loons in Central Alaska. Condor 94:282-286.

Quang, P.X. and R.B. Lanctot. 1991. A line transect model for aerial surveys. Biometrics 47:1089-1102.

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LOON AND GREBE POPULATION MONITORING ON THE TETLIN NATIONAL WILDLIFE REFUGE

Buddy Johnson

Loons and grebes were counted during ground-based waterfowl breeding pair and productivity surveys conducted on 11 waterbody clusters encompassing 110 waterbodies. Surveys were suspended pending standardization of waterbird surveys on Alaska refuges. Pacific Loons were the primary loon species surveyed with occasional Common Loons found breeding and incidental Red-throated Loons recorded. Both Horned and Red-necked Grebes were surveyed. Estimates of abundance, breeding effort, and productivity (number of young/successful pair; n = 10-17 pairs/year) can be determined from these data. The fairly uniform distribution of Pacific Loons and grebes result in relatively precise estimates of these parameters. The population estimate for Pacific Loons in the first 14 years of the study varied from 1,704 to 5,081 and the coefficient of variation varied from 20.7 to 27.6.

Years: 1982-1999; ongoing

Relevant Publications:

Loon and grebe status is discussed in the Refuge's Annual Narrative Reports.

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REPRODUCTIVE SUCCESS AND HABITAT USE OF YELLOW-BILLED, PACIFIC, AND RED-THROATED LOONS ON THE COLVILLE RIVER DELTA

Susan Earnst

The objective of this study is to understand the processes that affect loon productivity and habitat use across years and habitat types. All components of annual productivity (proportion of pairs nesting, clutch size, survival during incubation, survival during brood-rearing) have been monitored since 1995 by searching known breeding territories during early incubation and revisiting nests every 7-10 days through the end of August. Results to date suggest that there is substantial between-year variation in all components of productivity, that the variation is particularly pronounced in Yellow-billed Loons, and that the variation may be related to the timing of spring ice melt. Estimates of population size, changes across years, and densities by habitat type will also be calculated. Beginning in 1997, fish and invertebrate abundance were sampled in brood-rearing waterbodies and time-budget data were collected during brood-rearing. Food availability and other wetland characteristics will be related to parental feeding rate, brood success (particularly ability to raise 2 rather than 1 young), and between-year consistency in territory occupancy and breeding status. Resource selection will be investigated at the landscape and within-territory scale. Movements among brood-rearing waterbodies is fairly common in Pacific and Red-throated Loons; causes and consequences of brood movement are being investigated. In a given year, we monitor approximately 16 Yellow-billed, 50 Pacific, and 50 Red-throated Loon nests and broods.

A second objective is to obtain better habitat selection and population size data for Yellow-billed Loons across the National Petroleum Reserve (NPR). Although loons are counted on U.S. Fish and Wildlife Service Aerial Breeding Pair Surveys, until recently locations have not been plotted accurately enough to allow a detailed investigation of lake selection, and the fairly low detection rate provides only a small sample of loons each year. In each of 3 years we will intensively survey a section of the NPR between the Colville and Meade Rivers. These surveys, combined with the Ducks Unlimited Landcover Map and SAR (synthetic aperture radar) satellite data, will allow us to investigate Yellow-billed Loon choice of lakes in relation to lake size, depth, surrounding terrestrial habitat, and various metrics such as distance to coast or nearest river channel. We will also use these data to estimate total North Slope population size. The estimate may be more precise than presently available because of the higher detection rate and the ability to produce an estimate based on habitat strata.

Years: 1995-1999; ongoing

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COLVILLE WILDLIFE STUDIES

Rick Johnson

The Colville Wildlife Studies have been conducted by ABR, Inc. for ARCO, Alaska, Inc. since 1992. Three species of loons have been recorded on surveys of the delta and surrounding areas: Yellow-billed Loons, Pacific Loons, and Red-throated Loons. The primary method of survey is to use small fixed-wing aircraft flown in a lake-to-lake pattern during nesting and brood-rearing. Yellow-billed Loons have been the focal species of surveys; therefore, Pacific Loons and Red-throated Loons have been undercounted. In addition to aerial surveys, ground surveys have been conducted in different portions of the delta, but such surveys were not extensive or systematic. The main objective of the surveys was to determine abundance and distribution of Yellow-billed Loon pairs, nests, and broods, for which the aerial surveys were well-suited. Because the effort and intensity of the surveys for Yellow-billed Loons has remained consistent, the results are suitable for monitoring trends. However, such surveys are probably inadequate for judging nesting success or brood sizes. The ground surveys were intended to give site-specific information on nest and brood locations, especially near the Alpine development in the central delta. Habitat selection has been analyzed each year of study for Yellow-billed Loons during nesting and brood-rearing.

Years: 1992-1999; ongoing

Relevant Publications:

Smith, L. et al. 1992, 1993. Wildlife studies on the Colville River Delta, Alaska. Final report to ARCO, Alaska, Inc. by Alaska Biological Research, Inc, Fairbanks.

Johnson, C.B. et al. 1995, 1996, 1997. Wildlife studies on the Colville River Delta, Alaska. Final report to ARCO, Alaska, Inc. by Alaska Biological Research, Inc, Fairbanks.

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HABITAT-SPECIFIC DISTRIBUTION AND ABUNDANCE OF YELLOW-BILLED LOONS ON THE ARCTIC COASTAL PLAIN OF ALASKA

Susan L. Earnst

The yellow-billed loon (*Gavia adamsii*) is a relatively rare and patchily distributed breeder across the Arctic Coastal Plain of Alaska. Its estimated population size in Alaska is less than 3,000 individuals (Groves et al. 1996). Because of its restricted range, small population size, specific habitat requirements, and the potential for oil development throughout its U.S. range, the yellow-billed loon is a species of management concern to the U.S. Fish and Wildlife Service. Better information on yellow-billed loon distribution and population size is identified as a high priority need by the Alaska Loon Working Group. The objective of this study is to construct a habitat-based model of yellow-billed loon distribution and relative abundance. Aerial surveys were flown between the Colville and Meade Rivers, within and adjacent to the Northeast Planning Unit of the National Petroleum Reserve-Alaska (NPRO), during late incubation or early brood-rearing in 1998 and 1999. Within the 13 surveyed strips, each 3.2-km (2-mile) wide and 32 km (20 miles) long, we circled the perimeter of each lake > 17 ha, thus providing 100% coverage within the strip. Locations of yellow-billed and Pacific pairs, singles, flocks, and nests were plotted on standard 1:63,360 topographic maps. An additional 8 strips will be surveyed in 2000.

A total of >100 yellow-billed and >200 Pacific loon units (pairs, singles, flocks, or nests) were counted on the approximately 500 lakes in the 1331 km² (520 mi²) of surveyed tundra. Quantitative GIS analyses are in progress to build a predictive model of yellow-billed loon habitat use. Lake attributes, such as size, perimeter habitat, distance to nearest river, connectivity to other waterbodies, and distance to the Beaufort Sea coast will be obtained from a land-cover map of the National Petroleum Reserve. Satellite imagery, specifically, Synthetic Aperture Radar (SAR) data, will be used to classify lake depth as shallow (freezing entirely to the bottom) or deep (not freezing entirely). Distance to nearest lake occupied by a neighboring yellow-billed and Pacific loon will also be incorporated. The resulting data will be used to test hypotheses of loon habitat associations and to construct a habitat-based model of yellow-billed loon population size and distribution. The resulting estimates of population size and distribution will be compared to those based on existing U.S. Fish and Wildlife Service aerial survey data. This project is funded by the U.S. Fish and Wildlife Service, Region 7, Office of Migratory Birds, Nongame Bird Program, Anchorage, Alaska. Collaborators include Bob Platte, Bob Stehn, and Kent Wohl (USFWS, Region 7, Migratory Birds), and Martin Jeffries (Geophysical Institute, University of Alaska Fairbanks).

Years: 1998-2000

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WINTERING DISTRIBUTION, TRENDS, AND ECOLOGY

CHRISTMAS BIRD COUNTS

Brad A. Andres

The Christmas Bird Count (CBC) is sponsored by the National Audubon Society and occurs once a year during the two weeks surrounding 25 December. Counters survey a circular area that has a 15-mile diameter. Numbers of individuals are tallied for each species, and effort (party-hours) is recorded. In general, the same circle is surveyed each year. Besides natural fluctuations in populations, weather and observer effort can influence counts.

Below, I summarize information from 19 CBCs where loons and grebes have been regularly recorded. Entries are the average number recorded between 1985 and 1999. The number of years the count was conducted is also presented (n). Average counts are not adjusted in any way to account for variability in effort among years. Species codes include: Red-throated Loon (RTLO), Pacific Loon (PALO), Common Loon (COLO), Yellow-billed Loon (YBLO), unknown loon species (UNLO), Horned Grebe (HOGR), Red-necked Grebe (RNGR), Western Grebe (WEGR), and unknown grebe species (UNGR). Pied-billed Grebes have been recorded on the Ketchikan (3 times) and Kodiak(once) CBCs.

Information on the CBC can be found at: <http://birdsource.tc.cornell.edu/cbcdata/>

Count	n	RTLO	PALO	COLO	YBLO	UNLO	HOGR	RNGR	WEGR	UNGR
Adak	12	0.16667	4.75	1.66667	-	0.58333	13.0833	5.75	-	-
Craig	11	0.0909	10.9091	5.90909	-	1.54545	0.0833	16.8182	0.90909	0.0833
Cordova	2	-	120	24.5	4	14	23	43.5	-	5
Glacier Bay	11	2.90909	6.90909	29.4545	0.27273	2.18182	16.1818	6	-	-
Haines	5	-	-	0.8	0.2	0.2	3	14.6	-	-
Homer	14	1.28571	2.5	14.2143	0.28571	0.57143	15	22.3571	-	-
Cold Bay	12	0.0833	0.91667	1.25	0.66667	-	14.0833	6.41667	-	-
Juneau	15	0.73333	21.4667	3.73333	0.93333	1.06667	24.7333	8.93333	0.26667	0.0667
Ketchikan	11	1.45455	30.5455	19.5455	2.27273	12.3636	1.81818	22.4545	118	3
Kodiak	15	0.6	1.8	10.6	1.26667	1.13333	70.6667	28.7333	-	-
Mitkof Island	12	0.0833	17.75	5.25	0.33333	2	0.16667	7.16667	0.0833	-
Narrow Cape	15	2.53333	1.6	12.3333	0.46667	1.66667	57.7333	13.6	-	-
Seward	14	0.57143	2.64286	6.07143	1.85714	0.14286	21.8571	6.5	-	0.29
Sitka	15	3.53333	41.9333	38.2	1.8	16.2	10.9333	22.6667	0.2	2.8
Tenakee Springs	5	-	0.2	3	-	-	1	2.6	0.4	4
Thorne Bay	8	2.375	0.5	1.8	0.125	0.625	4.625	1	1.125	-
Unalaska	6	1	0.83333	7	0.16667	1	0.83333	9.5	0.16667	4.83333
Valdez	9	-	-	0.44444	-	-	3.66667	1	-	0.33333
Wrangell Island	7	0.57143	11.8571	21.5714	1.85714	2.71429	4.42857	15.1429	51.7143	-

DISTRIBUTION AND ABUNDANCE OF WATERBIRDS NEAR SHORE IN SOUTHEAST ALASKA

Jack Hodges and Debbie Groves

A progressive five-year aerial survey of waterbirds along the entire shoreline of southeast Alaska was started in 1997. The objective is to eventually obtain two complete surveys of the entire shoreline of southeast Alaska, one in summer and one in winter. Beginning with the north end of the area and proceeding southward, one-fifth of the total area was surveyed during each summer of 1997, 1998, and 1999, for a total of three-fifths of the entire area covered to date. The northernmost one-fifth was surveyed during the winter of 1997. Boat surveys covering approximately 35% of the air coverage were also conducted to validate and enhance the air surveys. The remainder of the survey schedule is dependent upon future funding; an additional one-fifth of the area is scheduled to be surveyed in February 2000.

The survey area extends from the high tide line out to 400 m offshore and includes all islands and islets in addition to the mainland. The survey method consists of flying a fixed-wing aircraft approximately 150 m from and parallel to the shoreline at an altitude of 30-40 m and a speed of 155 km/h. The pilot-observer and front right-seat observer each record all observed waterbirds, including loons, on their respective side of the aircraft into onboard computers. The software program used to record observations adds geographic locations to the observations, based on data from the aircraft's Global Positioning System receiver. Loons are identified to species when possible, but many of the loons that are observed in non-breeding plumage are recorded as unidentified loons.

Years: 1997-1999; ongoing

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PRINCE WILLIAM SOUND MARINE BIRD SURVEYS

David Irons, Steve Kendall, and Brian Lance

Since 1989 the U.S. Fish and Wildlife Service, in junction with the Exxon Valdez Oil Spill Trustee Council, has surveyed marine birds in Prince William Sound (PWS), Lower Cook Inlet (LCI) and southeastern Alaska (SE). Surveys were conducted in one year in SE and LCI and for 6 years in PWS including July of 1989, 1990, 1991, 1993, 1996, and 1998 and in March of 1990, 1991, 1993, 1994, 1996, and 1998; surveys will be conducted again in 2000. The objective of the surveys was to produce population estimates of all marine bird taxa in PWS. Surveys were conducted by small (25') boats along transects located 100m from land and offshore. About one half of loons were identified to species. Below are population estimates and 95% CIs for Red-throated (RTLO), Pacific (PALO), Common (COLO), Yellow-billed (YBLO), unidentified (UNLO), and total loons (TOTLO), and for Horned (HOGR), Red-necked (RNGR), unidentified (UNGR), and total grebes (TOTGR) by location (PWS data for 1998 only).

Loons

Survey	RTLO	PALO	COLO	YBLO	UNLO	TOTLO
LCI - summer	242 ± 283	595 ± 765	392 ± 266	63 ± 124	1270 ± 1207	2563 ± 1492
LCI - winter	0	44 ± 74	176 ± 148	38 ± 74	46 ± 67	304 ± 193
SE - summer	212 ± 195	1329 ± 990	1639 ± 1123	267 ± 422	1420 ± 1527	4868 ± 2169
PWS - summer	58 ± 78	50 ± 40	252 ± 220	0	498 ± 329	859 ± 406
PWS - winter	12.0 ± 15	713 ± 1048	505 ± 246	94 ± 160	431 ± 389	1754 ± 1185

Grebes

Count	HOGR	RNGR	UNGR	TOTGR
LCI - summer	0	0	0	0
LCI - winter	66 ± 43	427 ± 379	155 ± 126	648 ± 406
SE - summer	0	0	0	0
PWS - summer	0	106 ± 101	0	108 ± 101
PWS - winter	2353 ± 1044	1396 ± 763	809 ± 771	4558 ± 1530

Relevant Publications:

Irons, D.B., S.J. Kendall, W.P. Erickson, L.L. McDonald, B.K. Lance. In review. Nine years after the Exxon Valdez oil spill: effects on marine birds in Prince William Sound, Alaska. *Condor*.

Lance, B.K., D.B. Irons, S.J. Kendall, L.L. McDonald. 1999. Marine bird and sea otter population abundance of Prince William Sound, Alaska: Trends following the *T/V Exxon Valdez* Oil Spill, 1989-98. Rest. Proj. 98159 Annual Rep. 116 pp.

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WINTERING MARINE BIRD AND MAMMAL POPULATION MONITORING SURVEYS IN SELECTED BAYS OF KODIAK, ALASKA

Denny Zwiefelhofer

We have conducted shipboard surveys of all marine birds and mammals in Uyak and Uganik Bays on the western shore of Kodiak Island each February since 1980 and similar surveys in eastern and western Sitkalidak Straits from 1980-1984 and 1991-1997. The same cruise tracts were followed each year resulting in about 136 transects (Uyak-Uganik) covering 110 km² or 19 percent of the surface area of the bays, and 97 transects along the Sitkalidak Straits covering 125 km² or 15 percent of the surface area. The basis of our survey method is a short strip census of a 10-minute cruising time, with the ship moving along a straight path at a speed of 9 knots. The observer counted all birds observed forward of midship, and laterally on one side, to 300m. The forward scan was extended to the projected end of the transect in order to increase detection of ship-avoiding species. Transects were not randomly located; transects were selected to sample all areas of the bay by zigzagging across the bays from shore to shore. The length and direction of each transect were determined by the ship's speed, the 10-minute transect time, and obstacles in the water. This shore-to-shore transect method samples both nearshore and deeper water habitats within a single transect and the effects of tidal movements (up to 28 feet) are moderated by bisecting the shore with the transect.

Kodiak Archipelago winter population of seabirds and sea ducks is estimated at 1.5-2 million. Preliminary results for the western side of the study area are as follows: 1) The overall marine bird (all species combined) density in the study area varied considerably during the 18 year period but showed no relative trend. 2) Marine mammal population trends, with the exception of sea otters, were undiscernible due to low rate of occurrence. We were able, however, to track the expansion of the sea otter population into the study area. 3) Population increases were seen in Horned Grebes, Red-necked Grebes, loon species., Barrow's Goldeneye, Harlequin Ducks, Common Mergansers, and Red-breasted Mergansers. 4) Relatively stable populations or slightly downward trends were found for cormorants, Common Murres, Marbled Murrelets, White-winged Scoters, Surf Scoters, Black Scoters, and Oldsquaw. 5) Pigeon Guillemots have declined by over 50 percent over the past 18 years.

Relevant Publications:

Forsell, D.J. and P. J. Gould. 1981. Distribution and abundance of marine birds and mammals wintering in the Kodiak area of Alaska. U.S. Fish and Wildlife Service, Office of Biological Services, Washington, D.C. FWS/OBS-81/13. 81pp.

Zwiefelhofer, D. C., and D.J. Forsell. 1989. Marine bird and mammal wintering in selected bays of Kodiak Island, Alaska - A five year study. Unpubl. Rep., U.S. Fish Wildl. Serv., Kodiak National Wildlife Refuge, Kodiak, Alaska. 77 pp.

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CONTAMINANTS

BIOMONITORING OF ALASKA'S BREEDING LOON SPECIES

Dave Evers

BioDiversity Research Institute is a nonprofit research group that uses birds as ecological indicators of environmental contaminant loads. Our objective in Alaska is to use high resolution, site specific toxicology, demographic, and behavioral ecology studies to assess anthropogenic risk to all breeding loon species. Toxin exposure of mercury, cadmium, and other heavy metals are of particular concern. Our research is part of an international program investigating the cause and effects of mercury on piscivores, particularly loons. In 1995-97, toxicological analyses for Alaska samples showed low mercury levels in the Common Loon, Pacific Loon, and a small sample of Red-throated Loons. Sampling occurred in the Kenai NWR, Mat-Su Valley, and Anchorage Bowl for Common Loons, Tetlin NWR and Deadhorse area for Pacific Loons, and three Red-throated Loons were captured in the Mat-Su Valley. Much of the work hinges on capture of adult and juvenile loons through nightlighting techniques. While in-hand, loons are banded, color-marked on the legs and measured. Blood and feather samples are taken for toxicological analysis. Blood samples are also used for genetic diversity studies (using microsatellite and RFLP techniques) and to measure individual health (e.g., parasite loads, white blood cell counts, differentials). Stress hormones such as corticosterone are also measured. Marked individuals are followed over time to quantify population dynamics such as productivity, adult site and mate fidelity, annual rate of return, within and between season movements, and juvenile recruitment. Overall, 14 adults were banded in 1996 and 25 in 1997; blood and feather samples were taken from 29, 37, and 22 young or adults in 1995, 1996, and 1997, respectively. These databases have been linked with toxicological, demographic, and physiological information from across the country and Alaskan loons have generally provided a benchmark for comparison with more stressful environments in the Great Lakes and Northeast regions.

Years: 1995-1997; ongoing

Relevant Publications:

Evers, D. C. 1993. A replicable capture method for adult and juvenile Common Loons on their nesting lakes. Pp. 214-220, *In* L. Morse, S. Stockwell, and M. Pokras (eds.), Proc. from 1992 Conf. on the Loon and its Ecosystem. U.S. Fish Wildl. Serv., Concord, NH.

Evers, D. C., J. D. Kaplan, M. W. Meyer, P. S. Reaman, W. E. Braselton, A. Major, N. Burgess, and A. M. Scheuhammer. 1998. A geographic trend in mercury measured in Common Loon feathers and blood. *Environ. Toxicol. Chem.* 17(2)

Contact:

David Evers

BioDiversity, Inc., 195 Main St., Freeport, Maine 04032

BDLoon@aol.com; 207-865-3302

PACIFIC LOON BIOMONITORING ON THE TETLIN NATIONAL WILDLIFE REFUGE

Buddy Johnson

This is a cooperative project with BioDiversity, Inc.. The goal is to determine the exposure of mercury and other heavy metals in Pacific Loons relative to behavior and productivity as part of an international program investigating the cause and effects of mercury on piscivores. The Pacific Loon population on the Tetlin refuge has declined from a high of 5,081 birds in 1989 (coefficient of variation = 22.1) to a low of 1,704 in 1994 (cv = 23.3). The reasons for this decline are unknown. Loons were captured, color-marked, and blood and feather samples collected for genetic and heavy metals testing (n = 10 in 1996 and 13 in 1997). Information on the survivorship and reproductive success of color-marked Pacific Loons will be correlated with mercury body burdens, sediment mercury levels, and water chemistry.

Years: 1996-97; ongoing

Relevant Publications:

Evers, D., P. Reaman, and J. Kaplan. 1997. North American loon biomonitoring program: Alaska 1996 progress report. BioDiversity, Inc., 195 Main St., Freeport, ME 04032, 13pp.

Contact:

Buddy Johnson
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P.O. Box 779
Tok, AK 99780

Buddy_Johnson@fws.gov
(907) 883-5312

LOON MORTALITY AND NECROPSY RESULTS

Tamara Mills

Several causes of mortality in loon species have been identified through postmortem examinations and include: emaciation, trauma, microbial disease, lead poisoning, oiling, and drowning. Information regarding loon mortality in Alaska is sparse, with most deaths reported during the clean-up of the Exxon Valdez Oil Spill. Results for other regions of North America are available for reference. Persons and organizations to contact for additional information are show below.

Alaska and nationwide:

Dr. Christopher Franson or Kimberli J.G. Miller, DVM, Wildlife Disease Specialists USGS National Wildlife Health Center
6006 Schroeder Road, Madison, WI 53711
Tel: (608) 270-2400; Fax: (608) 270-2415
e-mail: chris_franson@usgs.gov and kim_miller@usgs.gov

Canada:

Neil Burgess, New Brunswick
Canadian Wildlife Service; e-mail: neil.burgess@ec.gc.ca

Dr. Pierre-Yves Daoust
Department of Pathology and Microbiology, Atlantic Veterinary College
University of Prince Edward Island, 550 University Avenue
Charlottetown, Prince Edward Island, C1A 4P3, Canada
Phone: (902) 566-0667; Fax:(902) 566-0851; E-mail: daoust@pei.ca

Great Lakes:

Dr. Tom Cooley
Rose Lake Wildlife Disease Laboratory, 8562 East Lansing, MI 48823-9454
Phone: (517) 373-9358; E-mail: cooleytm@state.mi.us

Northeast:

Dr. Mark Pokras
Director, Wildlife Clinic, Tufts University, School of Veterinary Medicine
200 Westboro Rd., N. Grafton, MA 01536-1895
Phone: (508) 839-7918; Fax: (508) 839-7930; E-mail: mark.pokras@tufts.edu

Dave Evers, BioDiversity Research Institute
195 Main St., Freeport, MA 04032, e-mail: BDLoon@aol.com

EDUCATION AND PUBLIC OUTREACH

ALASKA LOON FESTIVAL

Anchorage Audubon Society

The Alaska Loon Festival is a public outreach event originally conceived and organized by the Alaska Department of Fish and Game Wildlife Division (specifically Nancy Tankersley Fair). The Festival's primary objectives are to educate the public about the conservation of loons; celebrate the arrival of loons in Anchorage, the largest city in North America to still have nesting loons; raise funds for loon conservation; and recruit volunteers for ADF&G's Loon Watch survey.

The one day event was held in Anchorage and organized by Alaska Department of Fish and Game and the Anchorage Audubon Society in 1989-1992, 1994, 1996, and 1997. The Festival was held in Big Lake and organized by the Valley Chapter of the Alaska Center for the Environment (ACE) in 1998. The funds raised by the Loon Festival have been used in the past for education tools such as Loon Kits for schools, signs for lakes on the trail system in the Kenai National Wildlife Refuge, and more recently to help continue the Loon Watch program and the compilation of the valuable data the program produces.

Years: 1989-1992, 1994, and 1996-1999; ongoing

Contact:

George Matz
Anchorage Audubon Society
PO Box 101161
Anchorage, AK 99510

geomatz@alaska.net
(907) 345 3139

LOON EDUCATION KITS

Nancy Tankersley Fair

This kit teaches students about the five species of loons in Alaska, their adaptations to their environment and issues concerning their continued existence. The kit contains a comprehensive curriculum developed through a joint effort between professional biologists and educators. Slides, a cassette tape, videos, posters, books, and a loon costume can be found in this kit. Available from Alaska Science Center at APU, U.S. Fish & Wildlife Service-Anchorage, APLIC-Fairbanks, Alaska Dept. of Fish & Game-Fairbanks and Anchorage, Southeast Alaska Visitor Center-Ketchikan, Anchorage School District, Alaska State Museum, Kenai School District Media Center, some Mat-Su elementary schools.

Contact:

Nancy Tankersley Fair
Alaska Department of Fish & Game
333 Raspberry Road
Anchorage, AK 99518

nancy_fair@fishgame.state.ak.us
(907) 267-2149

**EDUCATIONAL RESOURCES AVAILABLE FROM THE
NORTH AMERICAN LOON FUND**

North American Loon Fund

The following resources are available:

Top 40 Questions and Answers about Loons: A conversational guide to learning about loons.

By Jeff Fair. An entertaining and educational booklet about loons written in an enjoyable format.

"Voices on The Wind" - A Resource Directory for Teaching and Learning about Loons and Lakes.

This directory is designed to help anyone interested in loons, and especially those interested in teaching about loons to find the information they need. It includes listings of books, magazine articles, technical reports, booklets, newsletters, audio and videotapes, and curriculum guides and kits that will help you learn and teach about loons. At the end of the directory you will find a listing of loon conservation organizations in North America.

Poster: "Loons - Symbols of Northern Wilderness"

A full color poster, 22 x 32 inches, depicting illustrations of all 5 species of loons and some threats to their health.

Contact:

North American Loon Fund
% Judith McIntyre
P.O. Box 554
Center Harbor, NH 03226

jmcintyre@utica.ucsu.edu
(315) 792-3088

LIVING WITH LOONS - LOONS AND PEOPLE IN SOUTHCENTRAL ALASKA

Brad Andres

A one-page, double-sided, two-color brochure that provides background on biology and conservation of loons inhabiting southcentral Alaska.

Relevant Publications:

Komarnitsky, S.J. 1998. Dividing the Waters: Lake users buzzing over noisy watercraft. The Anchorage Daily News, 9 August, 1998. A-1 & A-6-7

Fair, J.S. 1998. Silence of the Loons: Nesting pairs are shying away from Southcentral Alaska's human sprawl. Is it too late to bring them back? Anchorage Daily News, We Alaskans, 6 September, 1998. H9-14.

Contact:

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U.S. Fish and Wildlife Service
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Anchorage, AK 99503

Brad_Andres@fws.gov
(907) 786-3378

APPENDIX A:

MINUTES OF ALASKA LOON WORKING GROUP MEETINGS

1997, 1998, AND 1999

ALASKA LOON WORKING GROUP

MINUTES OF THE FIRST MEETING, DECEMBER 5, 1997

A meeting of loon biologists and enthusiasts was convened by Brad Andres (USFWS, Migratory Birds, AK) and Dave Evers (BioDiversity, Inc., Yarmouth, ME) to highlight conservation and management issues faced by Alaska's 5 loon species. The 25+ attendees from the USFWS, BLM, USFS, USGS-Biological Resource Division, Alaska Fish & Game, consulting firms, industry, and non-government organizations, expressed strong interest in forming a formal Working Group which would meet on an annual basis and work together via an email network throughout the year.

Presentations were given on loon abundance and status in western Alaska (Debbie Groves, Bruce Conant) and the North Slope (Rod King), status of Pacific Loons on Tetlin NWR (Terry Doyle), changes in populations and productivity of Common and Pacific Loons in the Mat-Su Valley and Anchorage Bowl (Jeff Fair), contaminants in Alaska's loons (Dave Evers), and loon adult and nest densities on the Yukon-Kuskokwim Delta (Brian McCaffery).

Alaska is fortunate to have a wealth of aerial survey data on loons, thanks to the foresight of Jim King and the other pilots that have been recording loons on Breeding Pair Surveys since the survey's inception. Our discussion focused on the strengths of the aerial data and types of data needed to supplement it (wintering distributions, productivity, etc.). We agreed that some form of a "needs assessment and/or conservation strategy" for loons was needed. We spent the final hour of the meeting listing potential conservation and management issues relevant to Alaska's loons. We agreed that Stage One should be a brief (2-3 page) summary of these issues. Stage Two will review data relevant to the issues and identify gaps in our knowledge. This approach allows us to quickly elevate the visibility of loons (Stage One) while giving us ample time to thoroughly review the data and consider ways to improve it (Stage Two).

Although we felt it necessary to focus primarily on loons at present, we will also champion the collection and exchange of information on grebes in Alaska. Grebes are ecologically similar to loons and can often be monitored under the same study protocols. Studies on grebes are included in the Project Directory.

The interim co-chairs are Debbie Groves (USFWS), Susan Earnst (USGS-BRD), and Dave Evers (BioDiversity, Inc). If you have any suggestions or concerns about the activities of GAVIA, please contact Susan.

Our goals and first-year objectives are summarized on the following page.

GAVIA: ALASKA LOON WORKING GROUP

A collection of biologists, managers, and enthusiasts interested in working together to elevate the status of loons, facilitate the exchange of information, and learn more about the distribution, status, and ecology of loons in Alaska.

CO-CHAIRS: Debbie Groves, Susan Earnst, and Dave Evers

GOALS

- Facilitate exchange of information among loon biologists, managers, and the public
- Identify conservation and management issues faced by Alaska's loons
- Review and identify gaps in our current knowledge of loon distribution, status, and ecology
- Facilitate collaborative projects among agencies and others

FIRST YEAR OBJECTIVES

- Form an EMAIL NETWORK and produce a MAILING LIST of loon biologists and enthusiasts. (Debbie Groves; available in January, 1998)
- Produce the LOON PROJECT DIRECTORY which provides a description of large datasets and recently completed or ongoing projects. It lists appropriate contacts and relevant publications for each. (Susan Earnst; available in January, 1988)
- Produce A NEEDS ASSESSMENT: STAGE ONE, a brief summary of conservation and management issues relevant to Alaska's loons. (Brian McCaffery; available March 1, 1988)
- Initiate A NEEDS ASSESSMENT: STAGE TWO, an in-depth review of available data, and an assessment of gaps in our knowledge. (To be written with the help of many people. Susan Earnst and Debbie Groves will coordinate the effort for Yellow-billed, Red-throated, and Pacific Loons; Dave Evers will coordinate for Common Loons.)

ALASKA LOON WORKING GROUP

MINUTES OF THE SECOND ANNUAL MEETING, DECEMBER 11, 1998

Held on Friday, 11 December 1998 in the Gordon Watson Conference Room of the U.S. Fish and Wildlife Service Regional Office, Anchorage, Alaska. A smaller group (7 individuals) met Thursday night to discuss loon issues in the Matanuska-Susitna Valley and results of this meeting are included below.

The meeting was convened by Brad Andres, Migratory Bird Management (MBM), U.S. Fish and Wildlife Service (USFWS), at 8:30 am. Thirty participants were in attendance and represented the U.S. Fish and Wildlife Service, U.S. Geological Survey - Biological Resources Division (USGS-BRD), U.S. Army, U.S. Air Force, Alaska Department of Fish and Game (ADF&G), Anchorage Audubon Society, Trustees for Alaska, University of Alaska (UA), Fairwinds Inc., and private citizens. The meeting was very positive and greatly benefitted from the wide-ranging expertise of the participants. The first part of the morning was spent reviewing specific projects. Below are topics of these presentations:

Alaska Loon/Grebe Project Directory - Susan Earnst, USGS-BRD.

Update on the distribution and abundance of loons in Alaska - Bob Platte and Bob Stehn, USFWS.

Proposal for research on Red-throated Loons on the Yukon-Kuskokwim Delta - Joel Schmutz, USGS-BRD.

Productivity and habitat use of loons on the North Slope - Susan Earnst, USGS-BRD.

Preliminary report of Alaska Loon Watch Volunteer Survey results for Anchorage and the Mat-Su Valley - Jeff Fair, Fairwinds, Inc., and Nancy Tankersley Fair, ADF&G.

Disturbance study of loons and grebes in the Mat-Su Valley - Tamara Mills, UA - Anchorage.

Investigations into the decline in population and productivity of Pacific Loons in the Mat-Su Valley of Alaska - Jeff Fair, Fairwinds, Inc.

After a short break, the group took up discussion of the Needs Assessment produced last year and assessed accomplishments made in 1998. Below are highlights of that discussion. We adjourned by 1:00 pm.

1. Alaska Loon/Grebe Project Directory

Susan Earnst recently distributed an e-mail requesting updates to the project directory for 1998. Susan will collate information during January and distribute project summaries by late February 1999. The purpose of the directory is to inform researchers, managers, NGOs, and other interested groups of the work being done on loons and grebes in Alaska. The directory

will need to be periodically updated (2-3 years?).

2. Counting loons on aerial surveys

Last year, we identified the need to encourage Canadian pilot-biologists to include enumeration of loons in their waterfowl aerial survey procedures. Bruce Conant, MBM, USFWS, agreed to generate a letter of encouragement. A draft is currently awaiting comments of the Chief of MBM in Anchorage and will be sent just prior to a nationwide aerial survey meeting in late February.

3. Yellow-billed Loon as a Species of Special Concern.

Nancy Tankersley Fair raised the question of petitioning the state to include the Yellow-billed Loon as a Species of Special Concern. Reasons for concern include relatively small population size and increasing oil development on the North Slope that might negatively affect breeding pairs. Nancy will be contacting those familiar with the species to solicit comments on the proposal.

4. Using existing data on loons

Bob Stehn proposed that MBM, under Russ Oates in Anchorage, routinely include all species of loons in their annual summaries of status and trends of waterfowl populations in Alaska.

Several other survey/data issues were discussed. Brian McCaffery suggested that helicopter-plot data collected from 1990-92 could help clarify patterns of abundance and distribution of loons on the Yukon Delta, and Donna Dewhurst added, on the Alaska Peninsula. Can MBM take the lead on this?

There was some discussion about the need to rectify numbers collected by fixed-wing with those collected on ground plots. This would entail using ground data gathered by Tim Bowman, MBM, on the Yukon Delta.

Similarly, a need was voiced to further analyze population data with respect to concordance in population trends among areas and among parameters (e.g., size and productivity). The suggestion was made to revisit Tetlin National Wildlife Refuge's trend data on loon productivity that initially differed from pair-count data (Buddy Johnson [Tetlin NWR], Susan Earnst, Jeff Fair).

5. Mat-Su valley loons

Several issues concerning loon conservation in the Matanuska-Susitna Valley were discussed Thursday night, and to a lesser extent, on Friday. Below are the main points.

a. Nancy Tankersley Fair reported that the ADF&G has funds to operate the Alaska Loon Watch this year. Despite future funding, oversight of the Loon Watch program will remain with ADF&G. In some years, outside funding (from USFWS, Anchorage Audubon, Alaska Center for the Environment [ACE]) may be necessary to meet basic operational needs. Nancy, and Jeff Fair, emphasized the importance of having someone abroad in the Valley to meet with property owners on a one-to-one basis and transmit the message of loon conservation. This would likely require additional funding. Brad Andres submitted a

Challenge Cost Share proposal that might help to meet this need.

b. Jo Christensen, Ecological Services, USFWS, commented on the need to identify loon habitat in the Valley. Work completed in the past (Ruggles' thesis and Loon Watch) might be a good starting point. Tamara Mills, in cooperation with MBM, plans further work in the Valley in 1999 that will include a fairly extensive aerial survey.

c. Research questions that will be pursued in 1999 include investigation into the cause of declines in Pacific Loons (Fair) and continuation of a study of the effects of human disturbance on loon and grebe breeding success (Mills). Both studies will include measures of lake occupancy and productivity.

d. Alaska-specific materials are needed to educate adults and school children about the conservation of loons and their wetland habitats. Doug Schamel, UA - Fairbanks, suggested that funds might be available through a UAF program that emphasizes the interaction of natural resources and community involvement. Such materials would supplement Alaska Loon Education Kits developed by ADF&G and available statewide via APLIC, ADF&G, ARLIS, Alaska State Museum, APU Science Center, and local school districts.

e. The Alaska Loon Festival, coordinated by Dori McDannold of Valley ACE, was held at Big Lake in May, 1998 and was a huge success. Plans are to hold the festival in the Valley every other year. Anchorage Audubon will likely hold some permutation of the festival in Anchorage on the off years.

6. Kenai area loon populations

Little is known about the status of populations of loons on the Kenai National Wildlife Refuge and in the surrounding area. Nancy Tankersley Fair and Elizabeth Jozwiak, Kenai NWR, proposed expanding the Alaska Loonwatch to the Kenai-Soldotna area. An on-the-ground, one-to-one public relations person would be needed to get the program started and publication of an article on loon conservation in the local newspaper was suggested. Anchorage Audubon Society has adopted the Kenai NWR and might be able to help. Other suggested partners included the Kenai Watershed group and the local UA campus. USFWS Challenge Cost Share might be an outlet for funding.

7. Incidental take of loons in set-nets

The problem of the incidental take of loons in set-net fisheries was raised. Little information exists on the magnitude of loon captures in the fishery. Kent Wohl, MBM, USFWS, agreed to contact Mike Rearden (Yukon Delta NWR), Cynthia Wentworth (MBM), National Marine Fisheries Service, and the ADF&G to incorporate loons into their data collection for subsistence and commercial harvest surveys. The ADF&G fisheries program might also have information on capture of loons in their test fisheries. Current inclusion of the North Slope in subsistence harvest surveys was questioned and is needed to understand threat of incidental take to Yellow-billed Loons.

8. Red-throated Loon proposal for the Yukon Delta

Joel Schmutz, Alaska Biological Science Center, submitted a proposal to investigate Red-throated Loons on the Yukon Delta. The proposal focused on: screening for contaminants in loon tissue (primarily lead), attaching transmitters to monitor movements, and estimating productivity and survival. Other possible lines of inquiry for Red-throated Loons that were mentioned included to: 1) examine the possibility of using ground plots to test accuracy of aerial surveys, 2) explore use of a measure of lake occupancy to detect a change in population (based on aerial survey locations), 3) investigate local bycatch in set-nets, and 4) consider a site on the North Slope as a comparison to Yukon Delta populations.

9. Wintering loon abundance and distribution

Last year, we discussed the need to synthesize information on the distribution and abundance of loons that winter in Alaskan waters. This need remained at the 1998 meeting. Nancy Tankersley Fair reminded us that she and Anne Ruggles wrote a report (ADF&G unpub. report) summarizing existing data on distribution and population size estimates for Alaska's summering and wintering loons. Jeff Fair mentioned that the North American Loon Fund was a clearinghouse for banded loon observations and might be able to provide some information. Brad Andres and Tamara Mills will initiate a literature review of loon wintering distribution during fall 1999. The focus will be initially on Alaska but may be expanded to all wintering areas of Alaska-breeding loons. Bruce Conant and Bill Larned (MBM) have some information on migration concentration sites.

10. Yellow-billed Loons

We briefly discussed information needed to better understand the biology of Yellow-billed Loons in Alaska. Principal was the need to improve the population and distribution estimates on the North Slope. Bill Larned suggested that MBM explore the potential to overlap time periods of two surveys on the North Slope to produce more precise estimates for loon species. Bob Stehn and Susan Earnst are building a habitat model to predict yellow-billed occurrence. Important predictors will likely include lake depth and size. Lastly, we know little about the distribution of Yellow-billed Loons in the Canadian arctic. This information is needed to understand the importance of Alaska to the North American population. Perhaps future aerial survey data will fill this gap.

I hope I have interpreted musings at the meeting accurately. If I have misrepresented your thoughts or comments, or have inadvertently omitted an important point, please forward refutations to me.

Submitted by Brad Andres

30 December 1998

ALASKA LOON WORKING GROUP

MINUTES OF THE THIRD ANNUAL MEETING, DECEMBER 16, 1999

Held on Thursday, 16 December 1999 in the Alaska Biological Science Center conference room of the U.S. Fish and Wildlife Service Regional Office, Anchorage, Alaska. The meeting was convened by Brad Andres, Migratory Bird Management (MBM), U.S. Fish and Wildlife Service (USFWS), at 8:30 am. Twenty participants were in attendance and represented the U.S. Fish and Wildlife Service, U.S. Geological Survey - Biological Resources Division (USGS-BRD), U.S. Army, Alaska Department of Fish and Game (ADF&G), Anchorage Audubon Society, University of Alaska (UA), and Fairwinds Inc. Several presentations were made by participants and these topics of are presented below.

Alaska Loon/Grebe Project Directory — Susan Earnst, USGS-BRD.

Distribution and abundance of loons on the North Slope — Ed Mallek, USFWS.

Productivity and habitat use of loons on the North Slope — Susan Earnst.

Southcentral loon publications — Brad Andres.

Red-throated loons on the Yukon-Kuskokwim and Copper River deltas -- reproductive success, contaminants, and satellite telemetry — Joel Schumtz, USGS-BRD.

Disturbance study of loons and grebes in the Mat-Su Valley — Tamara Mills, UAA.

Grave status of Anchorage Pacific Loons — Nancy Tankersley Fair, ADF&G.

Discussions of these presentations and other items followed.

1. Millennium Loon Count. Nancy Tankersley Fair proposed a single-day count of loons, in mid-July, for Southcentral Alaska. The idea is to muster a group of volunteers that simultaneously survey all loons on all lakes in a specified geographic region. Other areas of the state could also participate. Educational and outreach activities could be planned for later in the day. The Anchorage Audubon Society is developing a activity for Anchorage.

2. Publications. Several publications now exist to help expand information outreach for loons. Titles and contacts are printed in the project directory. Anchorage Audubon will be undertaking a direct mailing of the *Living with Loons* brochure to all

property owners that reside on loon lakes within Anchorage.

3. Northeast US Loon Working Group Report. We had a teleconference with members of the Northeast US Loon Working Group to discuss the structure and function of their working group and to get ideas for the Alaska group. They will be sending us some ideas of how we might coordinate with them on projects.

4. Alaska Loon Working Group Project Directory. Susan Earnst completed and distributed a draft of the project directory. All agreed it was a great job but believed the directory still has some gaps. We decided to fill these gaps and have a final draft by the Alaska Bird Conference at the end of February. The purpose of the directory is to inform researchers, managers, NGOs, and other interested groups of the work being done on loons and grebes in Alaska. The directory will be added to the USFWS website (Bob Platte) and will be periodically updated (about 3 years).

5. Counting Loons on Aerial Surveys. Two years ago, we identified the need to encourage pilot-biologists in other parts of the country to include enumeration of loons in their waterfowl aerial survey procedures. The response to this request was not encouraging and MBM, USFWS, will continue to press this issue.

7. Yellow-billed Loon as a Species of Concern. Offices of MBM and Northern Alaska Ecological Services are working together to compile information on the Yellow-billed Loons and prepare a status assessment. Jeff Fair and Trustees for Alaska are working on a population estimate for Yellow-billed.

8. Using existing data on loons. MBM, USFWS, is now routinely including all species of loons in their annual summaries of status and trends of waterfowl populations in Alaska. Several other survey/data issues still need work:

- a. helicopter-plot data to help clarify patterns of abundance and distribution of loons on the Yukon Delta and Alaska Peninsula.
- b. fixed-wing and ground plot comparisons.
- c. concordance of population trends among areas and among parameters (e.g., size and productivity).

9. Incidental Take of Loons in Set-nets. This problem was raised last year and needs resolution. Little information exists on the magnitude of loon captures in the fishery. Kent Wohl, MBM, USFWS, agreed to contact Mike Rearden (Yukon Delta NWR), Cynthia Wentworth (MBM), National Marine Fisheries Service, and the ADF&G to incorporate loons into their data collection for subsistence and commercial harvest surveys. The ADF&G fisheries program might also have information on capture of loons in their test fisheries. Current inclusion of the North Slope in

subsistence harvest surveys was questioned and is needed to understand threat of incidental take to yellow-billed loons.

10. Conservation of Loons in Southcentral Alaska. Last year, Anchorage Audubon was awarded a Challenge Cost Share grant by the USFWS to work toward the conservation of loons in Southcentral Alaska. In addition to the continuation of the Alaska Loonwatch Program in Anchorage and the Matanuska-Susitna Valley, numerous partners contributed to the expansion of loon education and research projects in Southcentral Alaska. Below is a brief description of these efforts. Anchorage Audubon plans more intensive work in the Anchorage area in 2000.

- a. Lynn Fuller and Martie Rozkydal designed and illustrated a brochure, *Living with Loons - Loons and people in Southcentral Alaska*. Whittington-Evans Communications printed 5,000 copies, and Anchorage Audubon members and Valley Alaska Center for the Environment began preliminary distribution.
- b. Nancy Tankersley-Fair, Alaska Department of Fish and Game, directed the manufacture of 50 *Do Not Disturb - Nesting Birds* warning signs that will be placed on loon nesting lakes.
- c. Purchased and began distribution of the brochure *Top 40 Questions and Answers about Loons* and the poster *Loons -- Symbols of Wilderness*.
- d. Tamara Mills continued her research on the effects of human disturbance on lake occupancy, hatching success, and chick survival of Common Loons breeding in the Matanuska-Susitna Valley.
- e. Nancy Tankersley-Fair and Jo Christensen, U. S. Fish and Wildlife Service, determined locations of loon nests in Southcentral Alaska for inclusion in a GIS database.

11. Kenai Area Loon Watch. In May 1999, the Kenai NWR, with the assistance of Jeff Fair, recruited volunteers for the first locally organized Loon Watch program on the Kenai Peninsula. A slide show and workshop motivated 28 local residents to volunteer to observe loons on 22 lakes on the Refuge and surrounding areas. Twenty-three Common Loons pairs and 6 Pacific Loons pairs were recorded. Funding for this initiation was provided by a USFWS Challenge Cost Share grant.

I hope I have interpreted comments at the meeting accurately. If I have misrepresented your thoughts or comments, or have inadvertently omitted an important point, please forward refutations to me.

Submitted by Brad Andres

22 February 2000

APPENDIX B:
A BIBLIOGRAHY OF LOONS IN ALASKA

BIBLIOGRAPHY OF LOONS IN ALASKA

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