

Wetlands International Diver/Loon Specialist Group Newsletter

Wetlands International Diver/Loon Specialist Group Established

The main objective of forming the Diver/Loon Specialist Group is to facilitate communication among loon researchers world wide. A special effort will be made to

- Develop an efficient communication network among loon researchers living in both the Old and New World.
- Develop a network of interested Diver/Loon researchers and managers, and maintain a mailing list with the indication of research interest on a world wide basis.
- Maintain close contact and coordinate activities with the North American Loon Fund - an established and very effective umbrella organization interested in loons in North America.
- Establish a core group of active members in Europe and Asia.

The Diver/Loon Specialist Group will continue to provide input to improve the Wetlands International world loon population estimate. (At short notice, early in 1993, population estimates of four species of loon populations were made by three contributors ready for the June 1993 Ramsar Conference). The improvement in accuracy of the world loon population estimates and the monitoring of population trends will be a major objective of the Specialist Group.

Organize workshops on loon research approximately every three year, separately in Europe and in North America, in association with the meetings of other bird or limnological organizations. In North America this will be done in close cooperation with the Research Committee of the North American Loon Fund.

The scientific workshops will be the major medium of communication among members of the Specialist Group. The Proceedings (extended Abstracts) of these Workshops will be published speedily after the meetings. The themes and topics of these workshops will be selected from the members' suggestions. The first such workshop was held in conjunction with the Annual Symposium of the North American Lake Management Society, November 1995 (see Abstracts). The second workshop will take place in conjunction with the Annual

Meeting of the American Ornithologists Union at St.Paul Minneapolis August 13-16, 1997 (see Meetings); and a Symposium to celebrate the conclusion of "Project Loon" in Sweden, will be held in Göteborg, Sweden in 1998 (see Abstracts and Meetings).

Publish an occasional "Newsletter" at least once between workshops.

The immediate objective is to build up a Specialist Group made up from active participants. To this end there is an appeal to individuals interested in the activities of the Specialist Group, to contact the Specialist Group Coordinator expressing their wish to join the Specialist Group. At the same time they should also give a brief statement of their research/management interest along with suggestions concerning the future activities of the Specialist Group.

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ITS SPECIALIST GROUPS

Wetlands International

During the International Conference on Wetlands and Development, which was held in Malaysia in October 1995, a new global alliance for wetland conservation was created. The new organization is called WETLANDS INTERNATIONAL, and is created by the integration of three existing international "wetland" organizations: the International Waterfowl and Wetlands Research Bureau (IWRB which had its operational headquarters in the UK), the Asian Wetland Bureau (AWB, with operational headquarters in Malaysia) and Wetlands for the Americas (WA, with operational headquarters in North America and Argentina).

This integration has been planned for several years, in recognition of the need for new initiatives and stronger partnerships to address the continuing loss and degradation of wetlands, worldwide. The final decisions to integrate occurred during joint governing body meetings, attended by more than 200 representatives of governmental and non-governmental organizations, as well as technical experts and observers.

Wetlands International has non-profit/charitable status and is governed by a global Board, comprising representatives of member countries, international organizations and wetland and waterbird specialists. The regional operations for Asia/Pacific, Africa/Europe/Middle East, and the Americas are governed by separate regional councils. Overall coordination is provided by a small International Coordination Unit, initially co-located with the headquarters for the Africa/Europe/Middle East region.

The catalytic work programme of Wetlands International will build on the combined activities of the founding organizations which have 14 regional or project offices on five continents and ongoing activities with local partners in more than 100 countries. The programme benefits from the input of National Delegates, Specialist Groups, partner agencies and a network of a great number of experts. Long-standing partnerships with secretariats of international conventions (notably Ramsar and Bonn) and other international organizations (particularly BirdLife International, IUCN and WWF) will be strengthened.

Wetlands International was launched on 1 January 1996 and is now fully operational.

Specialist Groups

The network of Research Groups has always been, an important and integral component of IWRB and has become even more critical to Wetlands International and its regional offices and programmes. This network of experts is essential to provide the organization with the data, technical information and scientific understanding, necessary for the conservation of wetlands and their

waterbirds.

During the XXXVI IWRB Executive Board Meeting in Malaysia, a number of important decisions were taken specifically in relation to the Research Groups. The Board adopted a Strategic Plan for Research Group Development. The Plan reviews the current structure and activities of the groups and aims to improve the link between the groups and headquarters. It also aims to better integrate the groups and Wetlands International's triennial forward planning and improve the level of support to the groups. Especially since the launch of the new organization, it will be essential for the groups to liaise more closely with the regional programmes.

Probably, the most visible decision taken at the last Board Meeting was to rename the "Research Groups" as "SPECIALIST GROUPS". This decision was taken in order to be more conform to the terminology used by IUCN for their extensive network of groups with similar functions as the IWRB Research Groups. However, this change in terminology clearly does not entail any change in the functions of the groups.

Link with the Species Survival Commission of IUCN

The waterbird Research Groups were grouped under the umbrella of one single "IUCN/SSC Waterbird Specialist Group", and IWRB was responsible for its overall coordination, in order to avoid duplication in reporting etc. for the coordinators/chairs of the groups for the various organizations. This system proved to be very useful and a close cooperation with IUCN/SSC developed. However, since the Research Groups have now been renamed as Specialist Groups, it will become too confusing to group these in another Specialist Group. Therefore, IUCN/SSC and Wetlands International have decided to replace the name "Waterbird Specialist Group" by "Waterbird Network". This makes everything much clearer, as all groups are now called Specialist Groups, and the waterbird Specialist Groups are grouped under the umbrella of the "Waterbird Network", which is coordinated by Wetlands International, in collaboration with IUCN/SSC and BirdLife International.

Contact addresses

The three regional headquarters of Wetlands International can be reached as follows:

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Janine van Vessem
Wetlands International

North American Loon Fund* Grants

North American Loon Fund (NALF) announces availability of 1998 Grants in support of management, research and educational projects directly related to the conservation of the family Gaviidae. Proposals in the range of \$500 to \$3000 (US) are the most likely to be considered for funding. High priorities include: 1). Identify and recommend non-toxic alternatives to lead for fishing tackle; 2). Identify and refine locations of important habitat areas for all loons during migration and winter and for juveniles loons during summer; 3). Obtain more information on the population dynamics of all species of loons, including the age of initial breeding, annual survival rate, longevity, and dispersal and sources of mortality; 4). Design methods of establishing populations trends for regions with significant loon populations but where trends are currently unknown.

Deadline for submission of proposal is December 15, 1997. Funding awards will be announced by March 30 1998. Please submit guideline request to North American Loon Fund, 6 Lily Pond Road, Gilford, NH 03246, USA.

*North American Loon Fund, a nonprofit conservation organization, sponsors research, management and educational programs throughout North America in an effort to check the population decline of this precious bird. The Fund also publishes scientific reports and a Newsletter. Annual individual non-voting membership is \$25.00 (US).

North American Loon Biomonitoring Program expands

The North American loon biomonitoring program is an international collaborative effort supported and organized by the research group, BioDiversity Inc. The program began in 1989 following the discovery of a time-efficient capture technique of adult Common Loons on the breeding grounds. Since then, it has expanded in scope and scale. Research topics now include behavioral studies, monitoring individuals through a variety of marking efforts, contaminants investigations, and population dynamics through observation and genetic sampling. Study sites have increased from the initial Michigan location at the Seney National Wildlife Refuge to 7 sites across the upper Great Lakes. In 1994, sampling expanded nationally including Alaska, the northern Rocky Mountains, New England, and the Canadian Maritimes. A total of 867 Common Loons have now been banded and uniquely color-marked. Most of these loons have had blood and feather samples taken to examine the extent and degree of mercury bioaccumulation. Use of these tissue samples has been incorporated into investigations of genetic and physiological studies.

Information on the loon's population ecology is extensive. The Common Loon is extremely site faithful to its nesting territory, however should a nest fail there are frequent examples of mate switching. The adjusted adult return rates are at least 80%. Some adults do not necessarily return to their nesting territory — around 12% switch territories each year. There have been 23 recoveries of banded loon and most are from the coastal waters of Florida. Quantifying the loons' behaviors through time-activity budgets is proving valuable in unlocking some of the subtle sexual and between-site differences. Over 4,000 hours have been spent making standardized observations of color-marked loons at the Seney National Wildlife Refuge, Isle Royale National Park, Ottawa National Forest, and Wisconsin's Turtle-Flambeau Flowage.

There are some concerns that contaminants, particularly mercury, are having adverse effects on the reproductive success, behavior, and survivorship of loons. The Common Loon appears to be extremely sensitive to environmental loads of methylmercury and serves as an excellent biosentinel for this heavy metal. Further toxicological investigations have prompted a number of collaborators to join this project, including behavioral ecologists, geneticists, toxicologists, physiologists, and several graduate students.

The program has recently expanded to include three additional loon species in Alaska - Pacific Loon, Red-throated Loon and Yellow-billed Loon. The same night-lighting technique is being tested on these species with promising results. Behavioral, toxicological, and population studies are being planned.

Multiagency, interdisciplinary working groups are being formed in New England, Great Lakes, and the northern Rocky Mountains.

CONTACT David Evers, Pete Reaman, Joe Kaplan, or Jim Paruk for more information on this program or participation in the working groups. You can find us at BioDiversity, Inc., 195 Main Street, Freeport, Maine 04032, Yarmouth, Maine 04096 (207-865-3302; e-mail: BDLoon@aol.com).

Abstracts

The following abstracts were presented at the 15th Annual Symposium of the North American Lake Management Society, "Aquatic Ecosystem Stewardship", Toronto, Ontario, Canada, November 6-11, 1995. The abstracts were published in the journal: Lake & Reservoir Management vol. 11 (1995).

SESSION 7: LOONS IN THE AQUATIC SYSTEM November 10

CHAIR: Dr. Joseph Kerekes. Canadian Wildlife Service, Environment Canada, 5th Floor, 45 Alderney Drive, Dartmouth, Nova Scotia, B2Y 2N6. Phone: 902-426-6356.

Session Abstract by J. KEREKES:

The session (three 1.5 hours segments) on loon research and management in aquatic systems is a joint effort of the Science Committee of the North American Loon Fund (SC,NALF) and the newly formed Loon/Diver Research Group of the International Waterfowl and Wetlands Research Bureau (L/D RG,IWRB). The session consists of 13 platform and 8 poster presentations. With the exception of one paper, a status report on the "uncommon" Yellow Billed Loon, the papers are devoted to the more familiar Common Loon. The presentations are evenly divided between field studies on loon populations (e.g. behavior, habitat preference, movements of marked birds, long-term monitoring of populations in two National Parks) and the monitoring of the body burden of toxic elements, mainly mercury, including necropsy results from loons found dead. Included are reports on the movement of color banded loons, on the results of the analysis of data obtained by volunteers and suggestions for a management strategy for loons in Ontario. Ten minutes are reserved for general discussion at the end of each of the three segments. This would allow participants to suggest ideas for the future direction and close cooperation of SC,NALF and L/D RG,IWRB.

The Uncertain Status of an Uncommon Loon: *Gavia adamsii*

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The yellow-billed loon's discontinuous, Holarctic distribution includes an extensive summer range, but suitable breeding habitat appears limited. Researchers estimate the Alaskan population at between 2800-3500 individuals, but there are insufficient data to estimate the Canadian, Palaearctic or world population.

This species is very susceptible to human disturbances, especially resource development and oil spills in breeding, staging and winter habitat. International cooperation is required to recognize, delineate and protect critical, sensitive habitat throughout its range.

Assessment of Effects of Heavy Metals on Common Loons (*Gavia immer*) Breeding in the Maritimes

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Recently in the Maritime Provinces of Canada, significant numbers of Common Loon carcasses have been found to have died of lead or mercury poisoning. The atmospheric deposition of heavy metals in southwestern New Brunswick is high, and the geology is such that acidification is also high, enhancing the release of heavy metals into the aquatic ecosystem. Capitalizing on data on breeding activities of Common Loons collected in the early 1980s by the Canadian Wildlife Service, the Lepreau Watershed area was selected as a study site for the assessment of the effects of heavy metals on Common Loons. Twenty-four lakes were surveyed to determine where the Common Loons were nesting. Among 24 lakes surveyed, loons laid 25 eggs in 14 nests on 13 lakes. In August of 1995, loons were captured and blood samples taken and tested for heavy metal levels. In addition, water and fish samples were obtained for testing from most of the 24 lakes. Based on the results of these tests, it will be determined if there is a serious problem with mercury and lead poisoning in Common Loons in the Lepreau area, and whether more study is required to determine the effects on their breeding.

Grouping Dynamics of Common Loon (*Gavia immer*) on Grafton Lake, Kejimikujik National Park (27 July - 1 October, 1993 & 20 July - 16 September, 1994)

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A man-made dam maintaining the water level of Grafton Lake in Kejimikujik National Park approximately two meters higher than would naturally occur, was due to be removed in the fall of 1994. In order to learn the effects of the reduced surface area and volume of water on the Common Loons (*Gavia immer*), a three year study of their grouping behaviour began in the summer of 1993. The main objectives of the study were to : determine total number of loons using the lake; determine territories and defense of resident loon pairs ; observe sizes and dynamics of loon groups; observe movements of loons to and from the lake, especially at night; and compare results before and after the draw-down. The lake appears to consistently support three resident pairs of loons, and one single loon. Although in 1993 one pair produced a chick, no chicks were produced in 1994. The territories were not as strongly defended in the second year, most likely due to there being no chicks to rear. The largest grouping observed was 12 adult loons on 12 August, 1994. Groupings of loons continued to be very dynamic in size and movement in the second year. It is still difficult to determine if any loons other than residents spent the night on Grafton Lake. It is suspected that loons often come from other lakes during the predawn hours.

Necropsy Findings in Loons From Eastern Canada: 1989 - 1995

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Necropsy results from more than 70 loons found dead or in moribund condition in Ontario and the Atlantic provinces over the period 1989 - 1995 are presented. Loons were examined for body condition, cause of death, significant disease conditions, parasite burdens and exposure to lead and mercury. Important causes of death included: trauma due to gunshot or collisions with boats, cars or power lines, lead poisoning due to ingestion of lead fishing sinkers, entanglement with fishing gear; ingestion of foreign bodies and infectious diseases, including Aspergillosis and enteric parasites.

Reduction of Incidental Catch of Loons by Increasing Mesh Size on Trap Net Tops

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In the past few years, under pressure from the public and state agencies to reduce incidental catch of common loons (*Gavia immer*), commercial fishermen on Lake Superior have changed mesh size on the tops of the hearts of trap nets from 11.4 x 11.4 cm to 20 x 20 cm without significantly reducing catch of fish. We hope to report that captures and drownings of loons have declined in the central Lake Superior region from current levels of about 200 per year. Extrapolation over the entire southern shoreline of Lake Superior should show similar large reductions in loon mortality. This number may be significant in view of the breeding population of common loons in Michigan, which is estimated at about 500 pairs.

Mercury Exposure in Feathers of the Common Loon (*Gavia immer*)

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The Common Loon is a high trophic level, long-lived, obligate piscivore at risk from elevated levels of anthropogenic mercury (Hg) through biomagnification. Annually, breeding loons spend at least 4.5 months on freshwater bodies and most spend a minimum of 4.5 months in marine environments during the winter. An effective technique for the capture of breeding loons now provides an opportunity to measure Hg exposure and its associated effects on survival, behavior, and reproductive success. Secondary feathers removed from 374 adult loons indicate that up to 93% of the body burden of Hg is deposited in feathers. Feather Hg levels for adult loons range from 4.0 to 36.7 ppm with a mean of 11.88 +/- 4.6 ppm. Feather Hg levels exceeding 15 ppm compose 17% of the sample set and in experiments with captive waterfowl, comparable levels of Hg were found to cause decreased reproductive success. Confounding variables associated with Hg exposure and its effects include sex, weight, age, and the mitigating impact of selenium (Se). The naturally occurring trace element Se may compensate or eliminate the toxic action of Hg and reduce its assimilation and rate of accumulation. As Hg increases, the effect of Se progressively decreases. From this study, feather Se levels range up to 8.61 ppm with a mean of 4.37 +/- 0.20 ppm (n= 382). From a sample of 62 adults, recaptured at least one year later, 47 (76%) exhibit an

increase in Hg accumulation and 15 (24%) show a decline.

"Project Loon" in Sweden

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Loons, or divers, are a source of attraction and fascination in all parts of their distribution area. This fact, in combination with an increasing concern for a low reproductive success and a complex of threat factors exposed to the two species of loons breeding in Sweden, were the main reasons for the initiative to start "Projekt LOM" (Project Loon) in Sweden in 1994.

Sweden inhabits 5,000-10,000 pairs of Arctic Loon (*Gavia arctica*), or 25-30% of the estimated European population outside Russia. With populations of similar sizes in Norway and Finland, Scandinavia is a key area for the species in Europe. The Swedish population of Red-throated Loon (*Gavia stellata*) is estimated to 1,000-1,500 pairs, or approximately 15% of the European population outside Russia.

The problems and threats to the Swedish loon populations are the same as those recognized in North America, e.g. disturbances from out-door recreation activities and reduced food supply in breeding waters affected of acid rain. In Sweden there are about 96,000 lakes larger than one hectare, 3,928 lakes larger than one sq.km and 395 larger than ten sq.km. In the late 1970s ca 25,000 lakes were acidified mainly in S Sweden. Since then more than 6,700 lakes have been limed with positive effects on the fishfauna. High levels of mercury have been found in eggs from loons breeding at lakes affected of acidification and mercury might be involved in reproduction failures. The production of young Arctic loons decreased significantly in 65 freshwater lakes in SW Sweden in 1982-1992 (Eriksson et al. 1995).

In the Swedish Red List of threatened and rare species both the Red-throated and the Arctic Loon are classified as "care-demanding". This category is used in the national Red List in addition to the IUCN criteria for species which are not endangered or vulnerable but nevertheless requires specific consideration in order to avoid a future threat.

The main aim of the Swedish loon project is to initiate and co-ordinate surveys of reproductive success of Arctic Loon and Red-throated Loon during a period of three years, 1995-97. This survey will be done on an entirely voluntarily basis and will engage about 200 persons. In 1995, data was obtained from > 170 breeding sites for Red-throated Loon, or 5-10% of the Swedish breeding population. For the Arctic Loon, data on breeding success

was obtained for about 250 pairs, or 2-5% of the national population. Both species showed in 1995 a breeding success somewhat above the average level reported during the 1980's and early 1990's.

The loon project is run by the Swedish Society for Nature Conservation and the Swedish Ornithological Society. The Swedish section of WWF, The Swedish Environmental Protection Board and local municipalities have given substantial assistance during the initial phase.

Necropsy Results and Concentrations of Mercury, Lead, Arsenic, and Selenium in Emaciated Loons From the Coast of North Carolina in 1993

J. Christian Franson¹, Thomas P. Augspurger², Kathryn A. Converse¹, Paul R. Spitzer³, and Erica A. Miller⁴¹National Wildlife Health Center, 6006 Schroeder Road, Madison, WI 53711; ²U.S. Fish and Wildlife Service, P.O. Box 33726, Raleigh, NC 27636; ³The Center for Northern Studies, Wolcott, VT 05680; ⁴Outer Banks Wildlife Shelter, 5810 Hwy 70 W, Morehead City, NC 28557 (Present address: Tri-State Bird Rescue and Research, 110 Possum Hollow Road, Newark, DE 19711)

In early 1993 an undetermined number of sick and dead common loons (*Gavia immer*) appeared along the coast of North Carolina. Birds found alive were weak, often with severe anemia and hypoproteinemia. We conducted necropsies of 30 carcasses and found most to be emaciated with an absence of fat reserves, no ingested lead sinkers or other metal, and no lesions suggestive of infectious disease. Results of bacteriology, virology, parasitology, and botulism testing were unremarkable. Feather samples and livers from 23 carcasses were analyzed for mercury and livers from 15 of these birds were analyzed for lead, arsenic, and selenium. Mercury concentrations in livers ranged from 2 to 84 ppm wet weight (geometric mean = 11 ppm), and were 20 ppm or greater in six (26%) birds. Mercury concentrations of feathers were 2 to 12 ppm dry weight. The liver lead concentrations were <0.2 ppm wet weight in all but one sample (5.8 ppm wet weight), arsenic ranged from <1 ppm to 3.7 ppm wet weight, and selenium concentrations were 4 to 16 ppm wet weight (geometric mean = 10 ppm). Liver mercury was significantly correlated with liver selenium. Mercury concentrations of 20 ppm wet weight or more in liver have been associated with toxicity in some species of birds. However, the interpretation of mercury levels in birds is complicated and the true significance of our findings is difficult to evaluate because many carcasses were frozen and/or somewhat autolyzed, preventing adequate histopathologic examination of tissues for lesions of mercury toxicity.

Behavior of Common Loons Nesting on Small Lakes With and Without Fish in Alberta, Canada

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We examined the foraging patterns and breeding success of Common Loons, *Gavia immer*, nesting on small lakes (< 100 ha) in central Alberta. Our objectives were to determine if behavioral differences exist between loons using naturally fishless lakes and loons on lakes containing only small bodied-fishes, and to relate any differences to breeding success. Three years of breeding surveys, on 20 - 41 lakes annually, suggested that although loons frequently use fishless lakes, they have a greater chance of breeding successfully on lakes with fish. To explore the behavioral mechanisms behind patterns of chick production, we conducted an intensive observational study of 4 pairs of loons nesting on fishless lakes and 4 pairs on lakes with fish. Continuous time budgets were compiled for both members, including diving patterns, feeding bouts, and care of chicks. Loons were found to alter their foraging patterns on lakes where fish were lacking and large invertebrates were the primary food source. It appears, however, that these behavioral changes may not be adequate to compensate for a lack of forage fish and to result in successful reproduction

Abundance and Distribution of Fish-eating Birds in Kejimikujik National Park, Nova Scotia (1988-1995)

Joseph Kerekes, Michael Duggan, Robert Tordon, Gabe Boros, Monique Bronkhorst. Canadian Wildlife Service, Environment Canada, 5th Floor, 45 Alderney Drive, Dartmouth, Nova Scotia, B2Y 2N6

The 7 year breeding population data obtained in 40 lakes in Kejimikujik National Park (385 km²) confirmed that the successful breeding of fish-eating birds such as Common Loon and the Common Merganser is controlled by the amount of fish available in a lake which is in turn controlled by the nutrient supply (phosphorus) in the lake. The number of territorial loon pairs remains stable (~39 pairs) while the number of chicks fledged may vary annually (mean 11.3, range 5 to 18). A large number of the non-breeding loon population spend their summer in the ocean. The relative closeness to the sea coast (~40 to 60 km in two directions) ensures that all the suitable loon territory in these lakes is soon filled when they become vacant. This may give a partial explanation of the low ratio (0.29) of loon chicks/territorial pair in Kejimikujik compared to other continental populations (>0.5) distant from the sea. Some of the annual fluctuation of breeding success may be the result of changes in water levels during the nesting period, but other less known factors (e.g. predation by Black backed Gulls) are probably at work as well. The total number of Common Merganser broods is very stable from year to year (average 13.4, range 12 to 16).

Nine years of Monitoring of Common Loon (*Gavia immer*) in La Mauricie National Park, Quebec, Canada

Denis Masse. Parks Canada. Parc National de la Mauricie.

For the past nine years, the status and breeding success of the common loon population of La Mauricie National Park (544 km²) has been monitored. Two aerial censuses are conducted annually on all lakes exceeding 3 ha (n = 76) and ground counts are also executed during the breeding season. Since 1987, the number of territorial pairs has increased (20.2 to 27 avg; 1987-90 : 91-95) but the number of breeding pairs has decreased (15.2 to 12.6 avg). The nesting success is stable (x = 68%; 50-89). The reproductive success (number of young survived to six weeks of age) has decreased (15.8 to 13.6 avg; 1987-90:91-95).

Morphometry and chemical characteristics of the lakes have been analysed to identify preferred breeding habitat and the parameters associated with the low reproductive success. The lakes used for breeding (n=27), compared to all other lakes used by loons (n=37), are large, deep, irregular shape with islands and have a low trophic level (oligotrophic) and a low alkalinity. Occasionally, small lakes are used for breeding. The reproductive success (1987 to 1994 grouped together) was significantly lower for smaller lakes (<25 ha), low pH (<5.5) and alkalinity (<2 mg/L) and higher level of human presence (>15 pers/ha).

Many actions have been taken by the park to protect this population and to reduce conflicts between visitors and loon. The water quality and fish population are being monitored in order to better understand ecosystem processes.

Bottoms Up for Loons

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Loon habitat preference is traditionally examined with respect to terrestrial features (e.g., islands, promontories, shoreline irregularities), food availability, human disturbance and water quality. Lake bottoms have not been looked at, yet loons spend much time underwater and bottom topography may be important in site choice. The bottom of the lake where I have studied the annual loon population of 10-17 pairs for the last 18 years was measured territory by territory in 1994 by depth finder with a graphic print-out and simultaneously recorded on a topographic map; 2 non-territorial sites were measured for comparison. Predictions based on prior observations to be tested in 1995 include: loons should court in shallow water, sleep over the deepest part, feed over irregular bottoms (e.g., shoals), raise young in aquatic vegetation and preen anywhere. Social gatherings should occur along slopes outside territorial waters. Results of these tests will be presented.

Volunteer Monitoring of the Effects of Acid Precipitation on Common Loon (*Gavia immer*) Reproduction in Ontario : The Ontario Lakes Loon Survey

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The Common Loon (*Gavia immer*) is a conspicuous and popular aquatic bird that inhabits large lakes (generally >20 ha on Precambrian Shield) across Canada. Because it relies on fish, it is a key bioindicator species linking acid precipitation to higher trophic levels in aquatic food chains. The Ontario Lakes Loon Survey (OLLS), a regional component of the Canadian Lakes Loon Survey volunteer monitoring program, was set up in the early 1980s to collect information on loon reproductive success, such as the number of loons nesting on a lake and the number of young they produce which survive to fledging. Between 1987 and 1994, over 5000 records (screened for completeness and accuracy) for loons nesting on more than 1000 lakes in Ontario (historically the principal region of study) were received from volunteers. Using this database, we tested whether loon breeding success exhibited spatial and temporal relationships to lake area, and pH (obtained from provincial and federal databases) in Ontario. Lake size was the dominant factor influencing loon breeding success. However, after controlling for lake size, we determined that loons were more likely to attempt nesting and were more likely to breed successfully on higher pH lakes. Continued monitoring by volunteers of loon reproduction and water chemistry on OLLS lakes will provide a reliable and cost-effective method of assessing the long-term health of large, acid-sensitive lakes in Ontario

Measuring the Effect of Mercury Exposure Common Loon Productivity in Wisconsin

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This study investigates whether elevated mercury (Hg) concentrations in fish on some northern Wisconsin lakes pose a threat to breeding common loons (*Gavia immer*). Over 390 adult loons and chicks have been captured on 80 lakes 1992-95; feathers and blood were collected for Hg analysis. Captured loons were individually marked

with color-coded plastic leg bands to allow for re-identification and capture in successive years. A significant negative linear relationship was found between chick blood Hg concentrations and lake pH ($r^2=0.51$); all chicks sampled on low pH lakes (pH<6.3) had elevated blood Hg (>2x mean chick blood Hg on neutral pH lakes). A negative linear relationship was also found between adult blood Hg and lake pH ($r^2=0.27$), however only 50% of adults exhibited elevated Hg exposure on low pH lakes (>2x mean adult blood Hg on neutral pH lakes) likely reflecting the fact that adult loons nesting on low pH lakes often forage on adjacent lakes and reserve the natal lake for chick rearing. The outcome of 233 common loon nest attempts was measured on the 80 study lakes 1992-94. Preliminary findings indicate that the number of chicks fledged/territorial pair was less on lakes pH<6.0; chick mortality was greater on these lakes. Current field research is quantifying common loon foraging success, chick provisioning rates, and rates of mercury loading in chicks to determine whether lesser productivity on acidic lakes is a function of reduced prey base or mercury toxicity.

Work of the North American Loon Fund (NALF)

Linda O'Bara, Director, North American Loon Fund, 6 Lily Pond Rd. Gilford, NH 03246
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NALF was established in 1979 to promote the preservation of loons and their lake habitats through research, public education, and the involvement of people who share their lakes with loons. We carry out this mission by: funding research on the loon family; prompting private and government organizations to take responsibility for loon research, management, and education programs; encouraging and assisting in the formation of new state, provincial, or regional organizations to carry out such programs where no appropriate or interested group now exists; providing a means of coordination and communication for groups and individuals involved in research, education, and management; educating the public through the creation and publication of recordings, audio-visual materials, books, posters, leaflets, and a Resource Directory for Teaching About Loons. NALF functions as an umbrella organization, with 14 affiliates at local, state, and provincial levels. We provide financial and technical support to grassroot groups and researchers. One of our top priorities is a grants program, through which funds are awarded for research, management, and education projects. NALF also acts as a clearinghouse and information exchange center.

Incubating and Chick Feeding Schedules of Common Loons

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I examined incubating and feeding patterns of four pairs of Common Loons (*Gavia immer*) at Seney National Wildlife Refuge in the eastern upper peninsula of Michigan. During 1993 and 1994, 114 nest exchanges were observed. Of these, 69% (n=79) occurred within one hour of 0600, 1200 or 1800. Males were on the nest at sunset at least half the time. In 75% of the cases (n=36), the bird that was on the nest at night was there the following morning. Males appear to play an equal role in incubating the eggs during the night. Sexes were remarkably consistent in their length of incubation. There was an increase in incubation length as eggs neared hatch date.

Although loon parents showed variation in chick feeding both parents are involved in feeding and caring for their young with some consistent individual and pair variations. Chick feeding began shortly after sunrise and typically continued for the next couple of hours. This was followed by a resting period of 30-60 minutes. Loons resumed moderate to steady levels of chick feeding until late afternoon and then showed increased feeding activity between 1500-1700 hours. Feeding decreased thereafter until one short final pulse of activity just before sunset. Loons were opportunistic feeders and took prey that was most readily available. Duration dives for prey items by individual loons are currently being analyzed. In addition, incubating and feeding schedule data gathered from 4 additional loon pairs at Turtle Flambeau Flowage in northern Wisconsin in 1995 are being summarized.

Local Movement Patterns of Marked Common Loons Late in the Breeding Season

Walter H. Piper, Molecular Genetics Lab, National Zoo, Smithsonian Institution, Washington, DC, 20008; **Michael W. Meyer**, Wisconsin Dept. of Natural Resources, Monona, WI; **David C. Evers**, Dept. of Fisheries & Wildlife, Univ. of Minnesota, St. Paul, MN & BioDiversity, Inc., 16 Lafayette Street, Yarmouth, Maine 04096. We studied post-breeding movements by leg-banded adult common loons in a 15km diameter study area in northern Wisconsin to learn how loons use lakes in general and to determine specifically if loons visit breeding territories to reconnoiter for potential breeding sites. The pattern of loon visitation in the study area was significantly nonrandom; loons visited lakes near their home lakes, never venturing farther afield than 4km. Most visitors were failed nesters, but pairs with chicks older than 4 weeks also visited neighboring lakes. Visits were made both to perennial breeding lakes and to lakes wherein breeding seldom occurs and suggest that loons might need more than isolated breeding lakes to sustain them during the breeding season. Records are too scanty at present to permit us to determine whether visits are in fact efforts at reconnaissance by loons seeking territories. If so, these late-season events might help explain the 15-20% rate at

which established breeders fail to return to their territories from year to year.

Toward a Management Strategy for Common Loons in Ontario

Merilyn Twiss, Department of Zoology, University of Guelph, Guelph, Ontario. N1G 2W1 and **David Hackett**, Biology and Environmental Studies, Nipissing University, North Bay, Ontario P1B 8L7

The common loon (*Gavia immer*) has been designated as Ontario's provincial bird, however, a comprehensive management strategy for this species has yet to be developed. An adequate management strategy must address all factors contributing to habitat loss, mortality and reduced reproductive success. Loon reproductive success, water level fluctuations and boating activity have been monitored on 30 central Ontario lakes having varying degrees of shoreline development. Lake parameters such as water clarity, pH and conductivity were also measured for the study lakes. Micro-scale habitat factors such as aspect, distance from water's edge, substrate and surrounding vegetation were recorded for all loon nest sites located. Using all variables measured, a habitat suitability model will be developed to predict potential lake use by loons, probable loon reproductive success, and shoreline critical to nesting loons. The model will be useful for development of land use planning policies central to a comprehensive management strategy for loons. The model will also indicate where lake stewardship programs, public education, and agreements with water regulatory agencies are required. Implementation of a loon management strategy for Ontario will only occur if the public recognises the need, and lobbies for it to become a political priority.

The Canadian Lakes Loon Survey

H.S. Vogel Canadian Centre for the Study and Preservation of Birds P.O. Box 160, Port Rowan, Ontario, Canada, N0E 1M0

The breeding range and numbers of Common Loons in North America have been reduced since the arrival of the first European settlers. Acid precipitation, shoreline development, and recreational use of lakes have been implicated as possible causes of these declines. The Ontario Lakes Loon Survey was begun in 1981 to investigate how these factors affect the presence and breeding success of Common Loons. The Survey was expanded to become the nation-wide Canadian Lakes Loon Survey (CLLS) in 1989. The CLLS relies on volunteer surveyors to report on the presence and reproductive success of loons, because volunteers provide the only cost-effective means of collecting these data over a wide geographical area. Surveyors also collect water

samples to gather water chemistry information on selected lakes. Survey staff undertake field studies to supplement the information gained from volunteers. In addition to its research and monitoring activities, the Survey provides data to researchers and the public, acts as an intermediary between researchers and concerned citizens, distributes materials promoting the preservation of loons to cottagers and other lake users, and educates and promotes a conservation ethic among Canadians.

MEETINGS

One Hundred and Fifteenth Stated Meeting of the American Ornithologist' Union, St. Paul Minneapolis August 13-16, 1997. One section – "LOONS: Old History and New Findings," will be published by the North American Loon Fund. Information: David Evers, BioDiversity, Inc., 195 Main Street, Freeport, Maine 04032 (207-865-3302; fax: 207-865-3614, e-mail: BDLoon@aol.com).

Limnology and Waterbirds, Monitoring, modeling and management. 2nd Workshop of Working Group on Aquatic Birds, Societas Internationalis Limnologiae. Mérida, Yucatán, México. November 24-27, 1997.

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Symposium to celebrate the conclusion of "Project Loon" in Sweden, (see Abstracts p. 6) will be held in Göteborg, Sweden date yet to be decided in 1988 or 1999:

"Research and Management of Loon Populations, in Sweden"

Information:

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NEW PUBLICATIONS

We welcome the notification of recently published material on loons and other diving birds that may be of interest to the group. Please include the title, abstract, and pertinent

information for citation. We encourage abstracts from hard to obtain "grey" literature as well as peer reviewed journals. Send your title (and abstract) to: joe.kerekes@ec.gc.ca

GRADUATE STUDIES

We would like to devote our next Newsletter to current or recently concluded graduate study projects. Please include the title, abstract, and pertinent information for citation. If you know of any projects that may be of interest to this group please contact the students and encourage them to submit information. Send your title (and abstract) to: joe.kerekes@ec.gc.ca

NEWS ITEMS AND ANNOUNCEMENT

COMMON LOONS have been color-banded in the Great Lakes, New England, Canadian Maritimes, Northern Rocky Mountains, and Alaska. Pacific Loons have been banded in Alaska. Over 1,200 Common Loons have unique color combinations on one or both legs. Colors used are dark blue, yellow, green, white, red, orange, blue stripe, green stripe and red stripe. If you sight a loon that is color-marked please record the color combination for each leg, the specific location, and date. Previous returns suggest the Great Lakes breeding loons winter in the panhandle area and the eastern coast of Florida and New England loons have been found on the Maine coast, but marked birds could show up anywhere. Please call if you have observed a color marked loon and send information to David Evers, BioDiversity, Inc., 195 Main Street, Freeport, Maine 04032, Freeport, Maine 04032 (207-865-3302; fax: 207-865-3614, e-mail: BDLoon@aol.com).

The Wetlands International Diver/Loon Research Group Newsletter is co-edited by Joseph Kerekes, Canadian Wildlife Service & Pete Reaman and Dave Evers of the private research group, BioDiversity, Inc. Send all correspondence or articles for submission to J. Kerekes, Canadian Wildlife Service, 5th Floor, 45 Aldemey Drive, Dartmouth, N.S., B2Y 2N6, Canada. (902) 426-6356, Fax: (902) 426-4457, e-mail: joe.kerekes@ec.gc.ca

