2004 Minutes - NORTHEAST LOON STUDY WORKGROUP
15th Meeting
The Loon Center
Moultonborough, NH

2003 POPULATION MONITORING AND MANAGEMENT COMPARISONS

State Comparisons – Harry Vogel, Loon Preservation Committee –
Populations: Based on extrapolation of subset of lakes

- ME – south of 45th parallel
  - Aerial surveys >> estimate ~4000 birds in northern ME
- MA - estimated at <100 birds
- VT
- NY
- NH

Territorial Pairs actually tracked

Evaluation of management efforts

- # Loon Nesting Rafts
- % Territorial pairs that actually use nesting rafts
- % Chicks hatched from rafts
  - VT = 60%
  - NH =
  - ME =
  - MA =

- Protection of nesting sites using signs or rope lines
- % chicks hatched in protected nest sites
- # Person days/lake
- How does management affect repro success & look at nesting attempt

Proportion of Territorial Pairs that Nest
Loon chicks hatched/nesting pair
Loon chicks survival (chicks surviving/chicks hatched)
Loon chicks surviving/territorial pair = "overall productivity"

- ~60-70% for all states except Maine
- ME = ~20%
- NY similar to other states despite less management
- Possibly indicative that management useful to maintain productivity in more developed areas

Nesting attempts/Female
Cost for migration

- Farther get from a wintering area to breed, cost of reproduction

Where to go with regional summary?

- Publication in Diver newsletter
- Annual report to state wildlife management agencies
- Peer-reviewed publication
- Important to call # estimates (with error bars?) – not statistically estimated full population

PROJECTS IN PROGRESS AND FUTURE PLANS

NY – Nina Schoch, Adirondack Cooperative Loon Program

- Review of ACLP's mercury research, satellite telemetry project, annual census, education/outreach programs

VT – Harry Vogel for Eric Hanson, Vermont Institute of Natural Sciences

- *See handout from Eric Hanson*
- Trend in breeding pop'n has been gradual increase, then did a big jump recently
- Territorial & nesting pairs all high
- More intruding loons and more chicks disappearing – possibly habitat becoming limiting?
- Statewide loon count – 205 volunteers
- Presentations
- Volunteers assist in placing nest rafts and protecting nest sites with ropes and signs
- Follows LPC protocol for raft placement (don't place until 3 successive failures)
- Legislation being discussed for regulating use and sale of lead sinkers
- Funding still an issue – Eric still seasonal
- Loons may be downlisted to threatened species
- Planning to continue banding work

NH – Harry Vogel, Loon Preservation Committee

- Discouraging raft use/placement by volunteers b/c navigation hazard, etc.
- *See handout*
- Total # adults has decreased for 3rd consecutive year, but chick survival is highest its ever been
- 27 years of monitoring
- Seeing declining trend in chick survival
- Declining but not significant trend in overall productivity
- Stable population over last 10 years
- Recovered 25 dead loons, of which 29% were due to lead toxicity at same time of high use>>indicating birds picking up tackle from use by anglers and not from reservoir of lead supply in sediments. Thus, probably due to non-compliance of anglers
- Working to get funding for research on Lake Umbagog population decline
- Loon territory ranking project
- NH passed 4 pollutant bill (S, NO, CO, and Hg) to decrease emissions

ME – Susan Gallo, Maine Audubon

- ME Audubon Loon Project has cut back
- Annual Loon Count ~1000 people involved
    - Many questions – e.g.: is info worthwhile or would it be better to invest fewer people doing more effort to get better data?
    - Volunteers not assisting financially with supporting Loon Project
        - Recommending that volunteers become ME Audubon members
- 20-year retrospective of Loon Project
- Education and management
- Living in Loon Territory brochures highly successful
- Loon carcasses collected for necropsy, but not actively
- Concerns about egg collection of potentially viable eggs by volunteers

- Potential projects - *See back of handout*
    - Possibly develop regional curriculum?
    - Discussion of loon rehab – especially hand-rearing chicks
        - Is banding released chicks to determine chick survival
        - Chicks get attacked by resident loons when placed on lakes with resident pairs
        - Concerns
            - Intensive management of loons
            - Emotional attachment
            - Change in focus of loon rescue organizations to loon rescue organizations
            - What is biological (population) value of rehabbing a few individuals – do they survive to reproduce?
            - Rehab of oil spill birds needs to be done through certified facility (e.g.: TriStates) – not legal for rehabbers to do oiled spilled animals under regular rehab license b/c of toxicity of oil

ME – Lucas Savoy, BioDiversity Research Institute

- Egg collection in ME dependent upon where have not collected before
    - Still collecting eggs in other states
- *See handout*
- Chick survival low at 49% and overall productivity = 21% - extremely low in comparison to other states – may not be representative of all of ME, but seems to be
    - Predation seems to be a big factor
        - Working with FPL to set up nest cameras to identify predators
        - Bald eagles predating chicks?

MA – Lucas Savoy, BioDiversity Research Institute and Rose Miconi, MA Aquatic Conservation Society

- *See handout and report available on BRI website*
- Weekly surveys to determine reproductive parameters
- Dan Clark on 3 reservoirs & MACs on six other lakes
- Developing network of volunteers to work on other lakes
- Habitat evaluation done, but need site visits to determine loon presence

RESEARCH UPDATES

Loon Mercury/Banding – Lucas Savoy, BioDiversity Research Institute

- *See handout*
- 105 birds sampled in 2003
- Montana – 5 recoveries from banded birds – spread out along western coast

Red-Throated Loon – Lucas Savoy, BioDiversity Research Institute

* *See handout*

Wintering Loons – Lucas Savoy, BioDiversity Research Institute

- Darwin Long
- Digital photos to follow molt patterns/sequence
- Banding to determine winter site fidelity, winter movements, migration to breeding areas…

Loon Health/Mortality – Nina Schoch, Adirondack Cooperative Loon Program

- *See handout*

Satellite Telemetry – Dave Adams, NYS Dept of Environmental Conservation
– L ucas Savoy, BioDiversity Research Institute
- Nina Schoch, Adirondack Cooperative Loon Program

- *See handouts – ME, NY, and poster from Wilson Ornithological Society*
- *See slideshow*

NH Loon Recovery Plan – Harry Vogel, Loon Preservation Committee

- Species Profile for the Common Loon in NH
    - Each state has to do one to qualify for federal funds
    - Willing to have other states use this document as a format
- NH Loon Recovery Plan
    - Coordinate state and federal agencies for loon recovery in NH
    - LPC's work has shown that management efforts are effective in loon population recovery
    - Educating decision makers – NH Legislature
    - Phase #1: Complete relational database and assess state of knowledge
    - Phase #2: Set additional management goals and evaluation methods to document loon recovery (downlist from threatened species)
    - Phase #3: Set timeline to achieve goals and guidelines to maintain long-term loon population in NH (
        - Management implications if loons no longer on threatened species list?) - still float rafts and post signs?
        - Population viability analysis, genetic markers/variability (Amy McMillan)
- State Comprehensive Wildlife Plan
    - All species in state, especially endangered and threatened species
    - All states have to submit a comprehensive wildlife plan to USFWS/feds within 5 years of obtaining federal funding
    - VT & NH using loons as sentinel species for a particular habitat type – northern forest
    - Data will be web accessible by ~2006-07

North American Status Assessment and Conservation Plan – Drew Major, US Fish and Wildlife

- Integrated plans for single species and groups of migratory birds
- Provides goals and objectives for implementing management and monitoring efforts and obtaining additional information
- Prescriptive Plan
- Regional USFWS office will release it in draft form – final version to be released ~1 year later from USFWS offices in Washington D.C. Draft version will be available on the web in 2004.

Population Modeling & Risk Assessment– Jason Grear, Environmental Protection Agency – Atlantic Ecology Division – NHEERL

- Population Viability Analysis
    - Need to know pop'n size to be able to evaluate effects of stressors on pop'ns >> changes in pop'ns (decrease, mainenance, or increase)
- Candidate Models for the Common Loon
- Factors affecting model selection
    - Model goals – what are questions that need to ask

        - What is probability of pop'n staying above a certain size?
        - How much does a stressor (Hg, shoreline development…) affect pop'n survival
    - Compatibility with data
        - Need to be adaptable to data
    - Heuristic value
        - Determine where holes are and raise questions
        - Life stage models
            - Survivorship btn life stages/age classes (juvenile to adult, adult year to year)
            - Rate could be based on several parameters – e.g.: age distribution of adults, breeding propensity, floating dynamics (non-breeding adults) – survivorship of juveniles to breeder vs. floater?
        - Lot of questions to ask and earlier that ask them the better model will reflect goals/answer questions

- Landscape broken into polygons
    - Establish relationships between vital rates (repro success, behavior…) and habitat, stressors
    - Matrix model
        - Periodic Matrix Model (mice study to be published in 2004)
            - Space treated implicitly
            - Can accommodate many levels of complexity
                - E.g.: movement of loons btn habitats…
            - Winter > Nesting > Incubation (clutch size) > (hatching success) Brood rearing
            - $n_{t+1} = A_{winter}(A_{nesting}(A_{incub}(A_{rearing}*n_t)))$
            - How sensitive is pop'n growth to adult survival, hatching success, fledgling success
            - Collapsed matrix model
                - Evaluate individual stages within life cycle
    - Life history – survival rates and fecundity
    - Spatial models
- Perturbation analysis
    - Independent of pop'n size – doesn't need to know spatial boundaries
    - Which life stage is most impt to pop'n growth (until get to density dependence/carrying capacity of habitat)
    - Elasticity analysis >> determines how changing one parameter affects pop'n
        - E.g.: Determining if management efforts are worthwhile
            - Models of loggerhead sea turtle determined that adult survival more impt than survival of hatchlings>>Use of turtle exclusion devices as management effort to decrease adult mortality
- Stressors
- Uncertainty
    - Might suggest that know more than actually do – e.g. juvenile survival during 1^{st} 3 years occurs several times in matrix models and not well known (difficult to measure)
    - E.g.: what age does Hg affect loons – egg survival, hatching success, chick survival, adult survival, adult repro success?
    - Mean and variation around mean – impt to have error included so can understand how it might affect

        - Natural variation
        - Observation error
    - Put into risk analysis in PVA
    - Can do PVA on annual counts
        - Stochastic pop'n growth rate based on time series of counts
        - >> estimate of pop'n trends – up or down (regionally, state…)
- Testing models with data
    - Independent set of data than more intensive pop'n monitoring that can be used to test each other
    - Expts to test predictions – field data to test predictions against new data

Loon Web Cam – Wing Goodale, BioDiversity Research Institute

- Will be set up again on Monday, May 3rd, 2004
- Established pair – nested successfully in past
- Camera on nest on island
    - Powered by solar panels
    - Transmitted to receiver – base-station
    - Sent to internet
- Night footage is with infrared
- ~800 hrs recorded in 2003
- Time lapse VCR
- Live streaming onto web
- Camera robotically controlled from office – zoom in, zoom out
    - E.g.: chicks started fighting as soon as hatched
- Excellent public education
    - ~6000 hits/day
    - Site hit millions of times
    - ~250 people watching at any time
    - High visibility in media
        - CNN, NYT, NPR, AP…
    - Nation and world-wide interest and visits to net
    - Increasing discussion of impacts on loons – e.g.: Hg issues, lead toxicity
    - Increasing public concern/bond for loons
    - Working on proposal to put on "highlight DVD"
- Scientific importance
    - Nest attendance by day and night
        - M vs. F vs. empty
        - F did 95% incubation at night
            - M defending territory?
        - M & F ~50:50 shared incubation duty during day
    - Incubation
        - Eggs laid ~48 hrs apart
        - Didn't incubate for first 2 days
        - F alert on nest during night – didn't sleep
    - Hatching
        - 1st hatching exactly 28 days after 1st egg laid, ~26 days after incubation started
        - 2nd chick hatched ~12 hours later ~26 days after incubation started
        - Didn't go into water until 2nd chick hatch
        - Once in water, chicks were fed

        - Chicks fought both on the nest, then fought in water, but did not fight after that
        - Hatching video all in real time – quality very good
    - Opportunities to evaluate different parameters
- 2004: Add external microphone facing down over nest to hear loon vocalizations
    - Microphone in camera in 2003 wasn't very sensitive
- www.briloon.org/ed

Loon Yodel Work – Jay Mager, Cornell University

- One of more structurally complex and energetically complex loon vocalizations
- Acoustic fingerprint to ID individual birds
- Intra-bird yodel variability and inter-bird variability
- Research to determine what features of yodel impt for long-distance communication
    - Pitch of 3rd introductory phase
    - Timing of repeat phase
        - Entire length of yodel
- How does yodel rate vary with calendar week and week into breeding season
    - Peak yodeling when establishing territories
    - Also lesser peak at time of hatching
- Intra-sexual signal?
- Estimated causes of yodels
    - Other loons – intra-specific signal
    - Flyover
    - Anthropogenic activities
        - Boats
        - Planes
- Change in pitch of yodel
    - McIntyre found change in pitch E to W and S to N
    - What is geographical location influence on yodels?
        - Relation to body size
        - Smaller birds in W
            - Indirect relationship with yodel
            - Body size directly related to ability to hold onto territory
            - Smaller birds had higher pitched yodel
                - Does length of trachea vary with body size?
    - Receiver independent constraints – problem within bird
    - Receiver dependent constraints
        - Maintains signal honesty
        - Other loons to check to see if bird actually as big as says
- Experiment: Playback response
    - To which of the 3 different pitched playbacks did M loons respond by yodeling most often
        - Low pitch (larger bird)>>unmanipulated>>high pitch yodel (smaller bird)
    - # repeat syllables is believed to convey willingness to defend a territory (Barklow, 1973)
        - When contests escalate into more potentially costly situations do loons tend to produce longer yodels
            - Loons tend to give longer yodels when intruder is w/in the terr than when intruder is flying over
                - Flies over

        - Lands
        - Swim w/in 20m
        - Social gathering
        - Chase
    - Data still to be analyzed…
    - Respond to yodels of dif. Length
- What would happen if change value of resource to loons?
  - Would M loons increase defense of territory if value of terr increases?
    - Nest raft placement – Are there behavioral consequences for using nesting platforms as a management practice?
    - Changes in terr behavior in repro success from pre-mgmt to mgmt to post-mgmt year (platforms removed)
    - Test lakes matched with control lakes that equal in size, shoreline, type, historical presence, banded pair
    - <u>Predictions</u>:
        - M's on experimental territories should be more willing to escalate a contest, if need be
        - Contests should be involve longer, more costly displays
            - Birds willing to invest more energy in protecting better habitat
    - <u>Results</u>:
        - Significant increase in length of yodels on raft territories
        - Males on 4 of 10 terr with rafts got displaced compared to 0 of 10 on control terr
        - Each male was displaced during the nesting period
        - Intrusion rates did not appear to vary w/in treatment group btn years
            - 4/15-May1: intrusion rates did not differ btn yrs for experimental terr, nor was there a diff in the annual change btn control and experimental groups
        - Repro success among control and exptml terr during pre-treatment and treatment years
        - #CH/egg laid and CF/egg significantly decreased
        - M on exptml terr produced longer yodels suggesting a greater willingness to defend terr
        - High M displacement – increased escalation of contests
        - Decreased repro success
    - Indications for mgmt
        - Increased intra-specific interactions
        - Recommendations for nest placement
            - Site suitability
            - Density of platforms
        - Appropriateness of placing platforms?
            - Presence of other loons
            - Historic repro success
    - Interested in recording yodels
    - Would like to look at dead birds to get an idea of body size in relation to yodels
        - Tarsus measurement and toe measurement
        - Trachea length

    - Body weight vs. condition
  - Integrating behavior into conservation

Botulism in Great Lakes – Dave Adams, NYS Dept of Environmental Conservation

- In Lake Ontario as well as Lake Erie in 2003
- Lake Erie outbreak not affecting loons in 2003 as much as previously
- *See handout*

Genetics Work with Amy McMillan – Dave Adams, NYS Dept of Environmental Conservation

- NYS DEC providing some funding to Amy to work on common loon genetics
- *See handout*

Umbagog Update and Future Plans – Dave Evers, BioDiversity Research Institute
– Kate Taylor, Loon Preservation Committee

- Proposal of NH Audubon to conduct full scale 3-year project to follow USFWS refuge plan – to obtain legislative interest/funding at national level
    - Incorporate into comprehensive plan - funding mechanisms already exist
    - Senator Snow and Collins
    - Timeframe in next 2-4 months
    - Appropriations in August
    - Used RONS already submitted (refuge operating ….)
    - NH DES developing systems dynamics model (SD model)
- ~40 adult loons lost over 3-year period
    - ~16 territories lost over 2 year period
- 50% decline in osprey also
- Anecdotal decline in mergansers and kingfishers also
- Unsure what to test samples for – no clear problem obvious
    - Hg not a problem
    - Biotoxin?
    - Leeches on legs of 3 loons – not previously observed on over 3000 loons captured in past
        - Leeches were species usually with fish host
    - Productivity on Umbagog has been declining, but last year improved and chick survivorship increased also
        - May be due to decrease in intraspecific pressure from fewer territories on lake?
    - Consider doing fecal samples to check for parasite load?
        - Could compare with fecal samples collected and sent to Tufts in early 1990's
        - Tufts also collected samples (unknown what sample types) 2 years ago (2002?)
    - Should talk with Dr. Pokras about parasite checks, health surveys…
        - Target territories that were hit before
- Fish populations have changed structure – bass much more prevalent
- Consider modeling to understand density dependence population structure
    - If mortality factors still exist, would be a sink
- ***Harry fill in this section as you see fit***

Oil Spills – Dave Evers, BioDiversity Research Institute, Kate Taylor, Loon Preservation Committee, Susan Gallo, Maine Audubon

- Buzzard's Bay spill 4/27/03 - barge struck something and leaked underwater

- Many species potential to be affected
    - Piping plovers and roseate terns were of significant concern – endangered species
    - >200 common loons staging in area – timing during migration
    - Red-throated loons also
    - Most of loons that were released assumed to have died b/c not reobserved
- Timing issues related to migration key to what species affected
    - Spring/fall spill more likely to affect migrating birds
- Logistics of who to notify and data that needs to be collected post-spill
    - Oil spill centers
    - Rehabbers
    - Increase in communication between USFWS & local monitoring organizations
        - Need to know potential gaps in species populations after a spill
            - Where birds came from (genetics markers)
        - Assess impacts: How many individual impacted and how that affects population
            - Were affected birds still able to make it back to breeding grounds to reproduce?
            - How many birds that weren't recovered?
                - E.g.: scavenging studies to determine how long it takes carcasses to disappear
                - Just during time when Buzzard's Bay spill happened
- Need for experienced people who know how to handle birds available for working on a spill
    - Can do emergency on-site training if needed
        - Good to have a "kit bag" ready
    - Difficult to coordinate/communicate with people working on a spill
        - Emergency situation
        - Many people involved
        - Command system in place
- Spill Drills – NH (5/20/04) & ME
- N.A. Loon Conservation Plan important to guiding how mitigation done in relation to loons
    - Habitat restoration and protection
    - Management
    - By-catch issue in Chesapeake Bay
- Info resource/database to develop
    - Identify staging areas for a species (loons) during migration
    - Sensitivity maps developed by state agencies
    - Impt to give info to state spill response areas to add to sensitivity maps
- Restoration Plans for spills – e.g.: North Cape $ used to buy land and habitat protection
    - Difficult to measure productivity enhanced by habitat protection – did you meet what you said you would do?
        - Territories used/protected
        - Chicks fledged/reproductive success
        - What happens if don't meet objectives
    - Funding for monitoring and management efforts to show that $ from spill actually does achieve targets
- Kate finalizing report for Veronica
- USFWS will be looking at morphometrics of carcasses and genetics…

Mercury – Research and Legislation – Dave Evers, BioDiversity Research Institute

– Harry Vogel, Loon Preservation Committee

- NERC – double issue of Ecotoxicology coming out in 2005
  - Coordinating NE mercury research into an overview publication
- Wildlife Criterion Value
  - NY research by ACLP
  - ME – ME DEP Legislation being discussed to implement regulation of Hg emissions exceeding WCV
  - Connecting abiotic compartment to biotic compartment
    - Same time/same place sampling important
    - Population level effect
      - ME – 40% decline in fledged young in high Hg pairs vs. low Hg pairs
        - >> significant negative growth rate based on population models
        - Confounding factors
          - Just because pop'n growth rate above 1 doesn't mean that not having an effect
            - Lamda could go from 1.8 to 1.2 due to Hg = decrease even though still above pop'n maintenance level
          - What triggers population level effect?
            - Important to define b/c leads to regulatory issues
            - Value decisions
- USGS Mercury Conference – Aug 16-17, Reston, VA
  - Scientists talk with land managers to discuss landscape inputs of Hg

- Dartmouth interested in bridging gap between human and ecological health issues
  - Combine loon, fish, and people components
  - NH doing human blood study – focusing on fish eaters

- Prospects for legislation of Hg in NH – battery recycling, etc.
  - Dispersed sources (very different from lead)
  - Human health issue – fish consumption advisories
  - Audubon will be promoting legislation beginning in 2004-2005
    - Conservative organization, but policy department more sophisticated in working with legislature (Charlie Leveck)
    - Partners need to be picked carefully (some very radical) – to be most effective
  - Develop quality PR materials (Clean Water Action group)

- NH DES interested in developing eco-risk assessment by lake in NH

Lead – Research and Legislation – Harry Vogel, Loon Preservation Committee
– Mark Pokras, Tufts

- Loon mortalities increasing – lead still accounted for at least ½ of mortalities despite ban on use in selected areas
  - In 2003, for first time since 1991, lead was less than half of loon mortalities
- Working on legislature to ban lead tackle use from all freshwater areas – total ban on use
- Will also ban sale in NH of sinkers </=1ounce and jigs <1 ounce
- If signed, starts in 2006
- As other states moved forward/incrementally improve laws, coming to confluence

NELSWG Coordinator Need, Role, Feasibility Discussion – Harry Vogel, Loon Preservation Committee

- NELSWG created to give larger regional perspective on loon-related conservation issues
- Not anyone's first priority so often work doesn't get done or done adequately b/c so busy with other things – e.g.: info for oil spill reports
- Possible role for paid-position – part-time
    - Coordinate meetings
    - Coordinate ideas/regional analysis of data – good statistician important for ability to analyze data well
        - Temporal trends in Hg spatial data?
        - Estimates of variation in life history – PVA/risk analysis
    - Fund-raising – coordinating btn different groups
    - Keeping work going between meetings
    - Person could be housed at LPC and be on LPC payroll
    - Seek funding for 2-3 year part-time position
    - Education/policy/data analysis
        - Coordinator for policy/education
            - Liaison between different loon organizations to give info to legislatures
        - Then coordinate and build foundation for post-doc award to do data analysis/statistical review of data to answer questions
- Differences from NALF
    - No membership
    - Supported by specific foundation grant – 2 or 3 year commitment
    - Research based info that will guide legislation to address conservation issues impacting loons and their habitats
        - Conservation issues on wintering habitats also and that affect juvenile survival
            - Bring results to states where loons winter and address conservation issues there
- Increase communication so know if accomplish tasks discussed at meeting
    - Summary of what got done each year based on previous year's meeting
- Develop executive committee to guide responsibilities of NELSWG coordinator
    - Representative from each state & province
- Eventually develop other regional groups to address loon conservation issues within that region
    - Then coordinate regional groups into national loon conservation organization
        - >>> Revive NALF?

Future Directions

- Continue regional summary of loon productivity
- Continue 1-2 page state summaries attach to minutes & put up on web and keep state discussions short
- Enables increased discussion of current status of issues

Next Meeting

- March 31-April 1, 2005 or April 7-8, 2005?
- LPC or Tufts?

Award for Drew Major from NELSWG and LPC

- Many years of dedicated service to NELSWG and LPC

- YEA!!!!