

2006 MINUTES - NORTHEAST LOON STUDY WORKGROUP
17th Meeting – Loon Preservation Committee, Moultonborough, NH April 6-7, 2006

2005 POPULATION MONITORING AND MANAGEMENT COMPARISONS

Harry Vogel, LPC

- Raft use in VT, NH, BRI (primarily hydro reservoirs)
- VT – now trying to pull rafts as birds adapt to using natural nest sites – will be interesting to see how rate of predation changes as birds switch from rafts to natural nest sites.
 - Many of VT lakes 50-90% developed, so natural habitat gone.
 - No longer placing rafts initially – waiting to see if birds nest naturally
 - Loons no longer on endangered sp. list in VT
- ME – Placing 2 rafts in some locations. Rafts can be moved to different site if original raft site disrupted by people or other problems.
- Raft designs not fully standardized b/n organizations, but similar >> comparable results
 - PVC designs not recommended – cedar log construction preferred.
 - Many different designs available – e.g.: on web
 - Don't want to make too big, b/c can get unstabilized – 4' x4' large enough
 - ME – FPLE – making minor adjustments to make easier to deploy, but still only see cedar logs with vegetation
- Signs & rope lines to protect nest sites
 - NH, VT, & MA >> large benefit in VT
- Monitoring efforts:
 - #Person days/territorial pair NY highest, MA = lowest
- NP/TP: NY ~ 80%, VT ~73%, NH ~75%, ME ~48% (a lot of pairs in DownEast ME don't nest – Northern ME vary different than Southern ME), MA~49%
 - Make bar height = total # pairs, then show # NP w/in bar
- CS = CF/CH: NY ~ 64%, VT ~83%, NH ~78%, ME , MA
- CS/TP: NY~48%, VT~79%, NH~55%, ME~30%, NA~60%

STATE PROJECTS IN PROGRESS AND FUTURE PLANS

NY

Nina Schoch & Amy Sauer, Adirondack Cooperative Loon Program

- Annual Loon Census – 5th year
 - Growing annually
 - Loons observed on ~75% lakes surveyed, with chicks on ~30% lakes
 - % Lakes w/o loons higher in 2005 than previously
 - # lakes reporting chicks = lowest in 2005
 - Will be analyzing 5 years of data to extrapolate out to estimate population
- Lower return rate on banded birds
- Satellite transmitters placed on 2 NY birds – who migrated to Cape Cod, spent the winter, but transmitters failed
- NH/ME placed transmitters on 3 birds
- Abdominal transmitters (Microwave) seem to last better than subcutaneous transmitters
 - Perhaps b/c of different configuration (abdominal transmitters all one unit vs. SQ transmitters separate from battery attached by a wire)?
- Plans for 2006 to remove transmitters from NY loons if able to catch them

VT

Eric Hanson, Vermont Institute of Natural Sciences

- Loons removed from endangered species list (criteria = 40 nesting pairs)
- In 2005, had ~56 nesting pairs
- No threat analysis of nest sites to determine what potential is of nest site being lost w/o mgmt

- How many at high risk vs. low risk
- Concerned about losing funding from state
- Expect chick productivity #'s to go down b/c intraspecific interaction & less mgmt efforts
- Good volunteer base to help monitor birds (especially those in trouble)
- Lead sinker law took effect – banning sale of ½ oz or less, next year = use of lead sinkers
 - Education
- Mercury law took effect – use & labeling
 - Dental & health
- Mgmt – using ½” sinking nylon rope for signs instead of cable b/c cables rust out & don’t last as long.
- Developing package for landowners who have nest sites to encourage them to put into conservation easement to protect shoreline.
 - Develop criteria to determine which sites should focus on (most at risk, most productive)
 - Tax break for having loon nesting site on property?
- Would like to develop packet of info for volunteers ~ to LPC’s intern info.

NH

Harry Vogel, Loon Preservation Committee

- *See handout*

ME – BRI/FPLE

Chris DeSorbo, BioDiversity Research Inst/Bill Hanson, FPLE

- May place 2 satellite (SQ) transmitters in 2006
- Regions:
 - Rangeley Lakes region (includes Flagstaff Lake, Sugarloaf...major hydro reservoirs, smaller lakes) = main Hg impacts study area.
 - Reservoirs very manipulated habitats (fluctuating water levels >> intense mgmt efforts to minimize impacts, even with natural nests to place floating platform or ramp under nests impacted by flooding or drought).
 - Very sensitive manipulation & not publicized to increase productivity
 - Acadia – small, ~8 territorial pairs, want to monitor human impacts on productivity
 - West branch of Penobscot: Moosehead, fluctuating reservoirs & smaller lakes, to evaluate restoration process of oil spills, funded through USFWS, ~38 pairs. Poor productivity
 - Downeast Lakes Landtrust Region: to evaluate restoration process of oil spills, funded through USFWS, ~95 territorial pairs.

ME - MEAS

Susan Gallo, Maine Audubon Society

- *See handout*
- 2006 = 24th year of Annual Loon Count
- Loon mortality studies with Tufts
- Would like to conduct habitat quality study in ME (~LPC)
- Outreach:
 - Working with BRI – “Loons in classroom” school (4-6th grade) curriculum DVD/CD combination to mail to teachers >> increasing geographic range of students
 - Putting together boxes of loon specimens to send to schools

MA

Chris DeSorbo, BioDiversity Research Institute

- Lakes not really being surveyed for productivity b/c of limited staff
 - Quabbin & Wachusett reservoir monitored pretty intensively
- # Territories expanding each year – now ~25 pairs, especially in Quabbin area
- ~125 potential lakes (>10acres in size, with good water depth...)
- Lead regulations by lake

- MA lakes seem to be imp't for staging of loons as migrate north
 - May be imp't to consider for oil spill mitigation
 - MA lakes heavily fished, so birds have high potential to be exposed to Pb toxicity and monofilament entanglement

AK – Joel to place abd transmitters in yellow-billed loons – BRI to work with Joel

STATE WILDLIFE PLANS – NE states listed loons as species of special concern – therefore imp't to implement mgmt efforts if needed

MN Loon program: # adults/100 acres of lake (loon habitat), and look at # chicks/2 adults

- not standardized productivity parameters with NE
- Important to know effort in collecting data to evaluate productivity
- Not eliminating lakes that aren't good loon habitat

DEAD THINGS AND THE THINGS THAT KILLED THEM

LOON MORTALITY IN THE NORTHEAST, 1990-2006

Flo Tseng/Sean Griffin, Tufts

- geolocations on loon mortality in NE
- evaluated in relation to Pb mortality
- GIS datasets available in public domain, can be joined to evaluate mortality spatially
- Causes of adult loon mortality
 - Pb toxicity – freshwater: NH highest
 - Higher probability of ingesting smaller sinker – size does matter for ingestion, but may be related to increased availability/deposition of smaller sinkers. Imp't for laws regulating size of fishing tackle (check Adam Duerr's MS thesis).
 - Cluster analysis >> mortality clustered around Lake Winnepesaukee, Bow, Squam
 - General trauma – boat accidents – all deposition in western parts of lake (wind, boat traffic?)
- Ranking lakes = loon mortality/ha surface area
- Possible decreasing trend in Pb related mortality in loons in NH.
 - Correlate with wet vs. dry year b/c #'s of fishermen out on lake
 - Trends may also be related to collection effort, so imp't to document effort & analyze data w/respect to effort to interpret correctly.
 - Could evaluate in terms of % of total necropsies to minimize effort correlation.

SEANET UPDATE

Becky Harris, Tufts

- Volunteer newsletter – *see www.tufts.edu/vet/seanet/seanet_news.shtml*
- Beached bird surveys 1-2x/month monitoring for dead +/- live birds
- Baseline mortality data
- Extension of other efforts (Pacific NW, Canada)
- Detection of threats:
 - Algal blooms
 - Contaminant patterns
 - Oil & chemical spills
 - Disease outbreaks
 - Fisheries bycatch
 - Wind farms?
 - Climate change?
- Involvement of volunteers, school science classes
 - ~300 volunteers involved along eastern beaches
- Beached bird field guide – laminated guide to dead birds (e.g.: foot key, head measurements...)

- Applications:
 - e.g.: chronic oiling in Atlantic Canada (due to illegal dumping of oily bilge waste. Seanet data used to support Bill C-15 in Canada (increases fine for polluters & enforcement)
 - Oil spill restoration info if have pre-spill info from Seanet

TUFTS STUDENT PROJECT UPDATES

Flo Tseng/Becky Harris, Tufts

- Necropsies & pathology
- Bone density in terns
- Tern mortality field sampling
- Seabird disease field manual
- Contaminants
 - Freshwater vs. saltwater Hg & Pb in loons. Pb coming from freshwater, but Hg in both
- Cholinesterase
 - Avian health surveillance network – sublethal effects of OP pesticides in birds – brain cholinesterase levels – common eiders, terns, chimney swifts, murre
 - Blood brain comparisons to look at live vs. dead birds
 - Body burden analysis
- Marine debris ingestion – especially plastics
- Fisheries bycatch
 - Shearwaters most often caught – in gillnets (= primary problem in Gulf of Maine)
 - >> estimates for Gulf of Maine
 - Healthy baseline – none emaciated vs. emaciated beached birds & rehab birds
 - Most show signs of trauma, including broken bones & internal hemorrhage
- Mortality events - terns
 - Maine: 2002-2004
 - Monomoy – Cape Cod – salmonella – probably related to viral source, but negative for West Nile, avian flu, Newcastle
 - Abnormal bone densities – pliable legs, beaks
 - Possibly nutritional?
 - Adults have higher bone density than fledglings
 - Red tide – saxitoxin – killed common terns on South Monomoy, Cape Cod
 - Common eiders – wintering off Cape Cod – parasites: acanthocephalans (larval forms in crustaceans), liver flukes; normal prey less available, eating higher proportion of other species.
- Evaluating/measuring nonmortality impacts of oil spills on tern colonies
 - To compare natural vs. sublethal effects of oil spills
 - E.g.: anemia – 5-100x more likely to be observed in year of spill
 - Data gap in loons - #'s of loons staging off coast – how many might be impacted by spill
- Online data entry available.

LOON HEALTH PROJECT

Nina Schoch, ACLP

- Limited # samples from NY loons evaluated for heavy metals, pesticides, exposure to avian diseases
 - Seeing low levels of PCB's & DDE in several birds
 - Several birds have antibodies for avian flu (strain not H5N1)
- Would like to obtain funding to expand baseline study throughout NE +/- other areas of country
- NYS DEC will be sampling loons for H5N1 avian influenza with cloacal swabs this summer.

BOTULISM

Nina Schoch, ACLP

- Extrapolated common loon die off on Lake Erie ~2000
- Die offs on both Lakes Ontario & Erie related to quagga mussels & round gobies

- In 2005, die offs started in early October, stopped finding birds in mid-Dec
- Amy McMillan archiving samples to genotype

OIL AND LOONS DON'T MIX – THE NRDA PROCESS David Evers, BRI/Molly Sperduto, USFWS

- USFWS – Natural Resource Damage Assessment & Restoration
 - 3 laws >> legal authority = CERCLA, CWA, & OPA
 - Goal to restore natural resources injured by oil spills
- North Cape Oil Spill, RI, 1996
 - Determine extent of injury & amount of restoration needed
 - Recovered loons (=67) are minimum # killed – many loons not recovered b/c sink, drift out to sea, scavenged, overlooked...
 - Estimated that at least 6x # recovered birds were impacted = 414 loons x 5.5 years (recovery time = avg age that loon would have lived if had not been affected by spill) = 2262 loon years; estimated # reproductive vs. non-reproductive birds
 - Include future reproductive potential: Lost offspring: # fledges *expected lifespan = 658 years
 - Total loss = 2262 + 658 = 2920 loon years
 - Identify loon restoration alternatives
 - Bird/habitat creation
 - Education – scaling difficulties
 - Nest site enhancement (rafts) – limited opportunities
 - Habitat protection (preferred):
 - Nesting habitat is limiting
 - Lakes with development pressure
 - Value added target b/c protecting other species
 - Scale Loon restoration
 - Protected loon nest provides 128 loon-yrs (productivity = 0.5 fledges/nest over 100 yrs)
 - 23 nests * 128 loon-yrs = 2944 loon-yrs (enough to restore 2920 loon-yrs lost)
 - Credit 0.5 nests for protection of adults
 - Recover damages
 - Recovered \$3million dollars in damages
 - Participated in 4 large forest conservation initiatives in ME, protecting nearly 1.5 million acres, including 125 loon pairs
 - Implement restoration
 - Additional Habitat Protection Measures
 - Lawyers worked to implement conservation easements to protect sites long-term
 - Limited recreation around nesting sites
 - Limited forest mgmt w/in 250 feet of a loon nest
 - Local loon monitors
 - North Cape Loon Monitoring Data 2000-2005
 - Productivity of birds in N. ME is lower than originally thought (~0.6 vs. 1 chick/NP) – habitat quality poorer/marginal – primary productivity low – multiple stressors
 - >> over time, falling short of goal of recovering 2900 lost loon years. So now looking at 359 pairs over 5-6 year period to evaluate avg productivity
 - Would like to quantify/standardize better for future reference to make it easier to determine how many loon years lost.
 - Include habitat ranking system to evaluate habitat quality to help determine # loon-years need to restore in a given area.

DISCUSSION – WHAT SHOULD WE SAMPLE FOR IN 2006?

All

- Avian flu: cloacal swabs – for analysis by National Wildlife Health Centers
 - Protocols to be issued soon
 - Interested in targeting sick or dying birds
- Coordinate organic toxicologic loon data for comparison with NY loon health analysis
- Natural History Museum in NYC has grants for work coordinated with museums – possible feather Hg study (Nina & Ken to possibly work on?)
- Peter Frederick – time trends of Hg in egret feathers – museums
- Morphometrics, genotypes, & isotopes >> multiple lines of evidence to help determine what breeding areas loons are from (especially feathers grown on breeding grounds vs. wintering grounds). Feathers for genetics need to be plucked.

OTHER RESEARCH UPDATES

LOON NEST RAFTS

Chris DeSorbo, BRI

- Analyzing nest raft data to evaluate raft use & effectiveness of rafts to help guide mgmt efforts
 - Compare raft use patterns on fluctuating vs. stable lakes
 - Quantify their effectiveness – reproductive gains
 - Using statistical model to evaluate effectiveness of raft use b/c can't necessarily control all variables
- Variables:
 - % nesting attempts on raft
 - Lake fluctuation type
 - Territory type (multiple vs. single territory lakes)
 - Human development index (human disturbance index)
 - Is it related to nesting success due to lake size or b/c it is real & related to human activity
 - Lake size data
- Results:
 - ~75% rafts used
 - Doesn't seem like water levels really impact if raft used or not, but may want to look at fine levels/microhabitats
 - ~50% rafts used w/in 1st year, ~90% used w/in 3 years. If raft not used w/in 3-5 years, probably won't get used
 - Significant influence of water level fluctuations on nesting success (chick hatch data b/c chicks fledged not really influenced by raft use)
 - Raft nesting birds seem to carry reproductive load for population on fluctuating reservoirs, with occasional contributions by natural nesting loons
 - Territory type not found to be significant
 - Human disturbance index affected hatching/nesting success (~3000 nesting attempts).
 - Highly correlated w/lake size (more development)
 - May not be representative for large reservoirs with no development.
 - Significant correlation btn lake size & nesting success
 - Interesting correlations btn lake size & human development index
 - Avian covers on rafts – help decrease human disturbance as well as minimize avian predation b/c camouflaged well.
 - Vegetation on rafts also helpful to protect loons from disturbance
- Interested in providing info to public about nest raft design so more standardized & using effective plans
- Important to determine presence of current territories & nesting success before placing rafts (e.g. for minimum of 2 years) to be able to determine effectiveness of success due to rafts.

- Looked at 10 yr & 30 year intervals
- Recovery of loon pair population over 30 years (positive linear trend)
 - Last 6 years seeing decrease in population over time
 - Also seeing local declines or increases – e.g. Umbagog
 - Important to evaluate data on different scales – local & overall
 - Absolute productivity 1975-2005, NP, CH, CS increasing over 3 decade period
 - Hatching success & chicks survivorship: changed depending on decade
 - CS/TP: variable depending on decade –
 - Can see impacts of weather on specific years – e.g.: severe rain event during nesting.
 - Shifts in age distribution can impact population through time in subsequent years
 - # New territorial pairs declining vs. # new nesting pairs pretty steady
 - May be due to habitat saturation (carrying capacity?) or poor habitat availability
 - Plateauing population growth >> may be that birds not dispersing to suitable habitat
 - # new lakes occupied over time increasing (per Mark Brennan)
 - May want to consider serial correlation for time series data – adjustments into regression model to account for changes over time b/c value in one year may affect other years (one year related to other years)
 - Need to evaluate analysis both biologically & statistically – is linear regression the appropriate test & is short-term decline really accurate trend
 - May not need statistics if data results readily apparent, but does give added support & can increase understanding

SPATIAL DISTRIBUTION OF LOONS IN NEW HAMPSHIRE -- SUMMARY OF PH.D. DISSERTATION**Mark Brennan**

- Data visualization (x , y (lat & long), z(elevation), t (time) preferred)
- Model verification (accuracy assessment)
 - Evaluate how good statistical analysis/modeling is
- Objectives:
 - Develop and implement new methods for automating data collection, mgmt, and geospatial analysis
 - Increasing pop'n
 - Determine past & future trends in COLO population
 - Determine occupancy of territories
 - Annual loon occupancy changes over time (tracking analyst from ESRI)
 - Regional analysis: North, Central, Southern
 - # lakes used increased in all 3 regions
 - Hatch rate greater in S region than others
 - Chick survival increased in all regions, strongest relationship in southern region
 - Loon occupancy model – logistic regression
 - Size of lake (larger better)
 - Depth (deeper better)
 - Distance from one occupied lake to another (closer better)
 - Elevation (variable – medium highest)
 - Preferred occupancy
 - High $p \geq 0.5$
 - Medium $0.2 < p < 0.5$
 - Low $p < 0.2$
 - Model verification 1997-2002 data
 - Fuzzy analysis

MULTI-SCALE APPROACH TO BREEDING LOON HABITAT MODEL DEVELOPMENT AND EVALUATION IN NH,

Anne Kuhn, EPA

- NH DES Lakes Monitoring and the Loon Preservation Committee Data
- Developing a multi-scale habitat model
- What scales are important
 - Issues of cross scale correlation, cross-scale prediction, spatial autocorrelation, multicollinearity, non-independence of data in space and time
 - Variance decomposition – investigate the effects of colinearity – what variables are most important
 - Nest-scale data - % land cover within 150 meter radius buffer of nest site and randomly selected points on absence data
 - Lake-scale data - % land cover within 150m and 500 m buffers around lake – also collected data on lake variables (mean depth, secchi depth, # islands, water chemistry, fish species, human population) – Every lake has a measure to close loon lake (present) and non-loon lake (absent)
 - Perimeter Area Ratio
 - Comparison between various scale models to determine best model – examines significant factors, AIC, Explained Deviance, Delta AIC, Akaike weights
 - Nest scale & 500m models best, 150m model poor
 - Seem to prefer less residential areas
 - Variance Decomposition – Nest variables are very important
 - 3 bioregional loon populations within NH based on natal dispersal, hydrologic boundaries and lake connectivity – Northern region are selecting on secchi, deciduous and agriculture, SW Region are selecting forested wetland, residential, SE lake area, distance to loon, P/A area
 - Loons in NH selecting at multiple scales (nest scale and within 500 m buffer)
 - All loons examined using a Habitat suitability index – used reference lakes (higher than 6.1, low in mercury, human census data was less than 2000) – 83% reference lakes are occupied – on lakes that had higher Habitat Suitability Index (HSI)
 - Future Research –
 - Evaluate spatial autocorrelation between nest sites and clustering of lakes – Is nest site location independent of lake configuration
 - Assess habitat quality based on productivity and nest success
 - Applicability of HIS habitat models in other regions (VT, Maine, Adirondacks)

UPDATE ON COMMON LOON POPULATION MODELING AND INTEGRATING STRESSOR INFORMATION INTO PROJECTIONS, Jason Grier, EPA

- Trying to determine how loons are doing in NH: Pop'n Viability Analysis
 - population fitness: pop'n growth rate is often measure of fitness (current condition of pop'n)
 - trends in pop'n size: size of pop'n through time – how changing
- What are factors limiting their fitness & how do we tease them apart? (no controlled expts)
 - Correlations btn specific factors & observed demographic traits (e.g.: productivity)
- How do we expect loon fitness to respond to changes in these factors?
 - Correlation
- Stresses that loons face are different in each phase of its life
 - Migration stress 1st year
 - Molt...
 - Mean age of 1st yr breeding = 6yrs age (~3-11yrs)
 - 1st yr birds return to breeding ground = 3yrs (1-2% return earlier) – oversummer two summers in ocean

- Have good data on survival, etc on breeding grounds, but poor on migration & wintering areas
- Matrix model:
 - Estimate annual juvenile survival = P_j
 - Estimate annual adult survival = P_a
 - Estimate how quickly juveniles become adults = G_j
 - Fecundity (F_a): rate that female survives winter x pairs successfully x territory x clutch x hatch x fledge
 - LPC data: $P_a = 0.5640$, $G_j = 0.1784$, $P_a = 0.9088$, $F_a = 0.2093$
 - Matrix model

| | |
|--------|--------|
| 0.5640 | 0.2093 |
| 0.1784 | 0.9088 |
 - Pop'n growth rate (λ) = $\sim 0.9953 \sim 1.00$
- Time series correlation model – accounting for variables in model that build upon data that is used year after year
 - Takes individual changes – sequence of growth rates
 - Log transformation >> normalization of growth rates & standardizes techniques & deals with autocorrelation problems
 - $\log(u) = 1.02$ (not changing a lot over time)
 - Variance at 95% confidence interval to predict where pop'n will be w/in given time frame
 - Fitness model very imp't, bc many pop'ns can't persist in natural environment unless growth rate well over 1.0 to enable them to compensate for periodic threats
 -
- Carrying capacity model – Using a density dependent model that is time series dependent – appears that carrying capacity is dependent on density for loon populations
 - Magnitude of slope dependent on density of pop'n
 - When pop'n small, great potential to grow b/c of high availability of territories
 - Limiting factor = territory availability
- Which model you choose to use in pop'n viability analysis very imp't.
- Loon Conservation Plan says should be aiming for $F_a = 0.2400 \gg \lambda = 1.0057 \sim 1.01$
 - A 1-2% increase in adult survival or a 6-8% increase in juvenile survival would yield a similar result as increasing fecundity (F_a) to 0.2400
 - Adult survival rate could be affected by what it experienced as a juvenile on its natal lake
 - Long-lived species tend to be very sensitive to changes in adult survival
- Mgmt to improve carrying capacity, best way to increase productivity is to increase adult survival
- Need winter resiting info of banded birds & more info on winter feeding ecology of loons
 - Winter feeding/diet may be affected by human fishing impacts (changes in fish species availability, etc), and biotoxins on wintering grounds
- Stressor Effects – how changes models – simplistic to develop methodology
 - Non-linear mixed effects statistical models
 - Fish Hg $\sim \exp(\text{lake} + \text{pH} + \text{length})$
 - Productivity $\sim \text{stressor A} + \text{stressor B} + \dots$
 - “Mixed effects” refers to the explicit treatment of random effects of individual lakes, from which multiple, nonindependent samples are taken
 - E.g. chicks/territorial F vs. summer pH of lake >> lake acidity negatively assoc with productivity for lakes with human pop'n >2000
 - Combine mixed effects model with loon pop'n model to understand effect on overall loon fitness
 - Simplistic model of summer pH & fish length & wet weight of perch >> fish bioaccumulate Hg faster as they get bigger

- How does fish Hg relate to loon blood Hg? Then how does it affect loon demography (survival, hatch success, etc...)? which then provides predictive capability & how Hg affects loon fitness

USGS effort – merganser model – load of Hg deposition on landscape & what that means to loon pop'n's & human health concept as well

- NESCAUM involved
- Not looking at multiple stressors like EPA is

DISCUSSION ON CARRYING CAPACITY AND POPULATION GOALS **Harry Vogel, all**

- Vision of full carrying capacity
- Mission: what are lower & upper limits for pop'n?
 - Spatial analysis (Anne & Mark) & LPC's lake tier system (3 tiers) >> info on habitat availability >> upper bound on carrying capacity (multiple lines of evidence – if converge, provide more support)
 - Data not fully standardized >> can affect analysis
 - If want to document changes in loon pop'n, need to monitor unoccupied lakes regularly as well as occupied lakes
 - Consider looking at other states & lake districts beyond where finding loons?
- Important for NH Loon Recovery Plan
 - Also need to consider changes in human pop'n/demographics over time
- Education that more isn't always better in certain circumstances

Discussion on collaborative projects and funding, part 1 All
 Banding summary Dave Evers, Chris DeSorbo, BRI

OUTREACH

SCIENCE ON THE FLY!, LOON SCIENTISTS PROGRAM Nina Schoch, ACLP

LOON WEBCAM David Evers, BRI

OUTREACH TO PUBLIC – DISCUSSION All

- Loon festival – LPC
 - Dunking tank, face painting, BBQ, loon call contest, presentations...
 - Family oriented: 10am-2pm
- ACLP's 5th Birthday celebration – July 15th, Sagamore Lake
- Wild New Hampshire event for all natural history organizations/agencies to promote themselves (Earth Day)
- NH public television wildlife show
 - A day with an LPC loon biologist
- VINS – USFWS field day in Oct.
- Lead Sinker exchange
- Public presentations
- Newsletters
- One-on-one personal contacts with LPC biologists

MANAGEMENT/MITIGATION

RECREATION AND LOONS -- DISCUSSION OF RESEARCH METHODS **All**

- LPC: 2nd biologist on Winnepesaukee to document human activity & how loons react
 - Focus on busy, busy periods compared to inactive periods (worst case scenario)

- Busy lake vs. remote lake to compare loon response to disturbance
- >> determine difference b/n background noise that birds used to & peaks of activity
- *May want to look at Mike Meyer's activity study in WI?*

LEGISLATION IN NH AND OTHER STATES

Harry Vogel, LPC; all

- LPC's lead & speed limit legislation
 - John Cooley's analysis of impact of lead fishing tackle ingestion
 - Loon pop'n has declined by ~30-40%
 - Loon chick & fledgling survival significantly less than statewide average
 - Safety issue for small boats
- Study committee to study effects of roping off & signing nests (~1 out of 4 loon chicks in NH hatched with use of signs/ropes) – legislation has been tabled for now
 - Ability to protect loon nest sites based on status as threatened/endangered (depending on state). If status changes, ability to protect nest sites may change.
- Mercury Bill – requiring Public Service of NH to install scrubber on power plant to achieve 80% reduction of Hg & So2 emissions over ~10 yr period.
- LPC research, not advocacy organization – goal is to bring good science to legislators to make sure they can make informed/accurate decisions. However, do select a few relevant bills to weigh in on b/c significantly affect conservation of loons & habitats

LEGISLATION RELATED TO LOONS AND HG

David Evers, BRI

- ME and NY wildlife criterion value for Hg
 - Procedure to estimate surface Hg water concentrations that will protect the viability of wildlife populations associated with aquatic resources
 - Similar to Great Lakes Water Quality Initiative & also used by EPA
 - Spatially explicit WCV to enable individual states to regulate off of
 - Test dose difficult to determine
 - Based on species that is sensitive to Hg toxicity & is exposed to Hg levels
 - “Hot spot” in most states – waterborne +/- effluent deposition vs. airborne deposition
 - Behavioral impacts
 - high-Hg birds sit on eggs much less than low-Hg birds (time activity budgets)
 - More lethargic with high-Hg levels
 - Pop'n model – lamda = 0.48
 - Test dose = 0.20ug/g (ppm) of MeHg in fish is significant for loons
 - 3.0ppm in blood
 - Weight loss
 - 40% fewer fledged young
 - Developed WCV for male vs. female loons, mink (very sensitive to Hg), & otter (relied on test dose from Nichols & Bradbury)
 - WCV for mink in ME = 1.14
 - >> concern for wastewater treatment plants for these #'s b/c many exceed WCV values
 - Different values from GLWQI & EPA – may be due to region or different assumptions
- National Hg monitoring plan
- Linking science to policy – *BioScience* paper

COLLABORATIONS

INTERNATIONAL CENTER FOR LOON CONSERVATION AND PUBLICATION OF THE FEDERAL PLAN FOR N. AM., Dave Evers, BRI

- Mgmt & applied oriented

- Assessing status of species ~770,000 birds in fall migration (includes juveniles)
- Migratory routes & connectivity
 - ~70% common loons migrate to east coast & ~30% go to west coast & Sea of Cortez
- Overall productivity ~0.53
- Sex ratio 1:1 (based on Amy McMillan's work)
- Christmas bird count data – upper trend in US, Canada has downward trend
- Objectives:
 - Monitoring
 - Collecting data for better statewide pop'n estimate
 - Migration stations with standardized protocols
 - Research
 - Emphasize loon pop'ns impacts landscape-level, multiple stressors
 - Emphasize loon pop'ns impacts from known localized stressors
 -
 - Education & Information
 - Web-based
 - Regional datasets
 - Promote responsible recreational fishing practices
 - Policy
 - Connect efforts & info in document with relevant plans
- Establish International Center for Loon Conservation to facilitate USFWS Loon Plan (based out of BRI's office)
 - Establish regional working groups
 - Prioritize & customize objectives & strategies by region
 - Implement at regional levels & connect regions for national needs
 - Function as the overarching entity for BRI's loon conservation program
 - Establish North American Loon Consortium (NARC) – (*scientific oriented vs. membership/public outreach oriented as was NALF*)
 - Supported by Rawson Wood
 - Interconnecting organizations in breeding & wintering areas
 - Periodic publication of papers in special issue of appropriate journal (~NALF)

PLANS FOR 2006 – COLLABORATING, RUNNING, SHARING AND ARCHIVING SAMPLES All

- Avian flu – National Wildlife Health Center wants live birds sampled
 - Ken & Drew to provide sample collection protocol
- Amer. Museum of Natural History – potential funding for collaborative study with museum specimens
- Coordinating lake characteristic data, fish data in NH to provide info for population models

FUNDING

- NSF proposal is good basis for other potential proposals
 - Need really clear question & how will collect data to address that question
- Continue to seek funding as collaborative group

DISCUSSION All

- State Comprehensive Wildlife Action Plans in each state
 - How to do better work with limited funding & staff
 - NH - Figure out what it is that want to have done & fund specific projects (as opposed to staff or organizations)