NELSWG 2018 Meeting Minutes

Day One – Thursday, March 15th, 2018

State Monitoring and Populations
State comparisons - *Harry Vogel, Loon Preservation Committee*
Other state reports/highlights - *Any*
Loons in the west - *Vin Spagnuolo, Biodiversity Research Institute*
Discussion of state monitoring efforts – gaps, collaborations - *All*
COLO wintering behavior - *Jim Paruk, St. Joseph's College*

Lead
Population-level effects of Pb tackle - *Tiffany Grade, LPC*
Lead poisoning in ME COLOs - *Brooke Hafford MacDonald, Univ. of Maine*
COLO bone lead study - *Kim Kirchner, Worcester Polytechnic Institute*
Fish Lead Free Initiative - *Susie Burbidge, LPC; Susan Gallo, Maine Audubon*
Lead tackle & fishing line recycling - *Jillian Whitney, MA DCR*

Mortality – Causes, Avoidance, and Restitution
Necropsy cases, mortality database and student projects - *Mark Pokras, Cummings School of Veterinary Medicine at Tufts University*
Rescue, rehab, and triage of loons - *John Cooley, LPC*
What to do with loon eggs? - *Mark Pokras, Tufts*
B-120 & joint NELSWG proposal - *Susan Gallo, Maine Audubon*

Day Two – Friday, March 17th, 2018

Contaminants, Pathogens, and Other
Temporal trends in Adirondack loon Hg Levels - *Valerie Buxton, Adirondack Center for Loon Conservation*
Lake acidification and related threats - *Rob Alvo*
Food web transfer of cyanotoxins - *Jim Haney, University of New Hampshire*
Squam Lake Loon Initiative update - *Tiffany Grade, LPC*
Fish populations and loons - *John Cooley, LPC*

Breeding or Lack Thereof
Climate change vs. loon chicks in NH - *John Cooley, LPC*
Potential impacts of climate change - *Mark Pokras, Tufts*
MA translocation effort 2015-17 - *Michelle Kneeland, BRI*
Signs and ropelines analysis - *John Cooley, LPC*
Loon Webcam - *Susie Burbidge, LPC*

The Future
Other research reports and ideas - *Any*
Research, management, and outreach priorities - *All*
National loon conference in 2019 - *Vin Spagnuolo, BRI*
NELSWG future directions - *All*
Other business/next meeting – *All*

State Monitoring and Populations

State comparisons - *Harry Vogel, Loon Preservation Committee*

- Regional numbers were similar except for Maine
    - Susan Gallo: Is decline in ME loons real? Poor survey day for census may have influenced numbers (it is a 1 day sample)
    - New York data is an extrapolation based on their census
    - There was discussion about LPC survey results vs the census. LPC hopes to one day do a comparison between the results
- Number of Rafts
    - Maine's decline in raft numbers is due to water level management practices allowing the removal of rafts (starting in 2014).
    - Alex Dalton & BRI are assessing how raft removal is impacting loons.
        - Mooselook Mcguntic Lake has always had low productivity
        - Flagstaff Lake has had dynamic productivity. Now there is higher water with a slow draw down creating a lack of nesting habitat in the early season. Noted that it is dangerous to speculate.
    - BRI has observed a decrease in the number of adult loons in the first year following raft removal.
- Percent of chicks hatched from rafts
    - Massachusetts
        - Quabbin and Wachusett Reservoirs have been kept more stable in the past few years which may be contributing to higher productivity.
- Person days
    - New York benefits from local colleges for person power, other entities should look to do this.
- Nesting Propensity
    - New Hampshire down due to weather?
    - MA did not have spring weather issues.
- Chick Surivorship
    - New Hampshire least variable
    - New York had low survivorship, Nina Schoch mentioned increased eagle predation.
    - Massachusetts – Lee Attix indicated increased eagle activity.
    - Do loons have an ability to adapt to eagle pressure?
        - Maine may be an example of this.
- Productivity
    - Vermont increasing management and may be seeing increased productivity as a result?
    - Massachusetts 2017 productivity was typical of 10, 15, and 20 year average.
- Other Aspects
    - Vin Spagnuolo reported that the Connecticut loon pair on Benedict Pond returned in 2017 (third year in a row) and hatched a chick.
    - There was some continued discussion about eagles taking adult (healthy?) loons.
    - Susan Gallo reported that Maine is seeing an increase in the number of unpaired loons
        - Sees consistent numbers of unpaired loons

        - The date of the census in July may be too late in the season to accurately count unpaired adults as there may be failed breeders being counted.
        - Time of day may influence unpaired loon count.
        - Would like to do an analysis of old census data.
        - Investigate citizen science benefits to loon work and how can we continue to angle it for conservation – improve the comparisons to biologist collected data.
    - Lee Attix would like to further investigate the differences in productivity of raft nests vs natural nests.
        - Should we be putting out more rafts?
        - The group discussed that there are numerous raft designs across the continent and we should investigate the merits of each design.
        - We are seeing an increase in raft diversity.

Loons in the west - *Vin Spagnuolo, Biodiversity Research Institute*

- Vin discussed the findings from the work conducted in the GYE where the population currently numbers 20 territorial pairs.
    - Vin updated the group on BRI's intention to translocate and captive rear chicks in Wyoming.
- Vin gave an overview of the status of loon populations in Washington, Idaho, and Montana.
- There was discussion about the loon/avian bycatch issue on Yellowstone Lake and the continued work to quantify the impact of the bycatch on the local population.

Discussion of state monitoring efforts – gaps, collaborations - *All*

- Rob Alvo asked about the Federal role in loon conservation in the USA.
    - The MBA has less power today.
    - Loons aren't listed at a federal level to consider action or funding.
    - At the state level SWG funding comes from federal money.
    - Each state makes its own designation and drives conservation.
    - Lacey Act addresses the transportation of wildlife across borders.
- Drew Vitz mentioned that there is a new bill that pulls funding from oil and gas revenue for state wildlife funds ($1 billion total for all states). There's maybe a 50/50 chance it gets passed and Drew will send more information.

COLO wintering behavior - *Jim Paruk, St. Joseph's College*

Jim discussed his work in the Gulf of Mexico (Louisiana) and South Carolina (reservoir) studying wintering loons and contaminants. He has caught 128 adult and juvenile loons over 7 years. He has a paper on oil impacts on blood chemistry that he hopes will come out in 2019.

- Loons are showing 85% winter site fidelity.
- Young loons show lower fidelity.
- He is seeing continued evidence of fidelity in all locations.
- Females tend to migrate further south than males.

    - Are males trying to make an earlier return to breeding grounds?
- Further questions to ask:
    - Distribution differences?
    - Behavioral and social differences?
    - Feeding strategies?
    - Fresh vs salt vs brackish water differences?
- Findings:
    - There were about 150 loons in the winter.
    - Loons are more social in freshwater than salt water.
    - 2-10 loons per 1 km transect.
    - Flock foraging observations:
        - Working schools of fish 2-6" at 30-40' depths.
        - Gulls and grebes come in on the feeding.
        - Is there social learning? Gulls identify schools then draw loons or vice versa?
        - This activity occurs daily.
        - Aggregations of fish at river mouths
        - Foraging on catfish as well, so they may be foraging at 200' depths.
        - How are the foraging at these depths – strategies.
    - USM masters student:
        - Coastal river deltas vs other coastal habitat (non-delta).
        - Loons gather at river mouths, and there is a tidal influence.
    - Coastal vs Freshwater group & foraging differences:
        - Freshwater foraging appears to be more successful.
        - Social foraging dives are shorter in duration.
        - Following individuals shows regular grouping.
        - 86% grouped, 2-3 to 7-12 loons.
        - Nightly rafting observed.
        - Do males molt sooner?
            - Lee Attix thinks no variation from his observations.
        - Some loons remain solitary.
        - There is need for an ichthyologist to better understand foraging dynamics, etc.
        - "Feeding Frenzies" observed – hoots in other loons?
        - Vin Spagnuolo added that loons are using coastal freshwater in winter time for short periods of time – unfrozen lakes.
            - Jim agrees that freshwater habitat is less harsh, better foraging, etc.
            - Washington has loons wintering on freshwater.

Lead

Population-level effects of Pb tackle - *Tiffany Grade, LPC*

Tiffany gave some updates and new findings with LPC's lead research

- Tiffany thanked NELSWG for its continued support, input, and guidance on this research.
- NH loon population is great for studying lead at a population level.
- Looked at mortalities from 1989-2012

- Lead was determined to be cause of death if it met 2 of the following criteria:
    - Tissue or blood showing high lead levels.
    - Necropsy report.
    - Object archived.
    - Radiograph.
    - Field collection report indicating lead toxicosis.
- Did not count 15% of mortalities – very conservative.
- Did some jig vs sinker corrections which matters greatly for regulations on tackle.
- Lost 1% of NH population annually
    - This is based on mortality collection rate, extrapolating 1.7% mortality annually.
    - Majority of lead was jigs, 10% other lead.
- Data did not suggest loons were picking it up from bottom
    - Peak in mortality that coincides with fishing pressure
- Reviewers asked for effects size statistical analysis (biological significance).
- Non-lead tackle/line issues mirror fishing pressure.
- Lead mortality: 2/3 had associated tackle
- There was a statistically significant drop in lead mortality post legislation.
- Population growth rate declined 1.4% annually due to lead mortality
- Population (2012) is 43% lower than where population would have been with absence of lead mortality.
- Defined population impact as difference in growth rate between observed and modeled populations.
- LPC management is masking effects of lead mortality.
- There has not been a response from the fishing community to this research.

Lead poisoning in ME COLOs - *Brooke Hafford MacDonald, Univ. of Maine*

- Only covering the biological impacts of the study, not covering the social science study.
- Only focusing on adults.
- Human behavior is a critical part of the lead issue.
- "Bare" jigs in legislation is notable, "painted" jigs are ok.
- Susan Gallo added that this was a concession with the opposition.
- Results:
    - Sampling is opportunistic, no standard method for recovering carcasses.
    - Similar peak in #'s as seen with NH.
    - Many unknown deaths.
    - Leading cause of death – Lead (25%).
    - Males made up more of the lead mortalities than females (70%).
    - Perhaps larger males snap lines more often?
    - More females die from loon trauma.
    - There is decreased lead mortality in northern Maine.
        - Different tackle used in northern Maine?
        - Less ability to find carcasses or detect dying loons?
        - More fly fishing in northern Maine.
    - 62 ocean mortalities out of 480.
        - 5 lead mortalities on ocean, 2 in December.

        - Typically freshwater tackle found in ocean lead mortalities.
    - Body condition in winter:
        - Mass compared to morphometrics to determine condition.
        - Poorer condition birds are easier to catch?
    - % of lead deaths over time have gone down.
    - Trauma cases have increased over time.
        - Have to be conservative with trauma.
    - There were some diagnoses in early lead mort cases that were changed/corrected.
    - 21-28% lead mortality reported in other studies.
    - 50% lead mortality in NH.
        - NH sees increased fishing pressure.

COLO bone lead study - *Kim Kirchner, Worcester Polytechnic Institute*

- Currently available lead detection methods include direct analysis of the following tissues:
    - Blood
    - PM body fluids
    - Feather
    - Crushed bones
    - Other body tissues
- Portable XRF allows for the quantification of lead in loon bones without needing to crush the bone, subsequently analysis can be performed on live birds.
- Bone lead levels represent the long-term lead load of individuals and are incredibly valuable in building our understanding of long term lead exposure effects.
- The portable XRF method was used to measure lead in in tarsus bones of deceased loons with the skin on and the skin off.
- Results were compared to those of crushed bone samples from the same individuals and analyzed with ICP-MS.
- These results validated the portable XRF method as accurate.
- This method may be far off from field application because of the cost of instrumentation, however many universities have access to this equipment and there is potential for research projects within the university framework.

Fish Lead Free Initiative - *Susie Burbidge, LPC*

New Hampshire Update

- 2017 had an increased number of lead mortalities – disappointing.
- 40,000 brochures were ordered and they have 7,000 left over.
    - Will reorder more brochures in 2018/19.
- Fish Lead Free Website:
    - Need plan for more content.
    - Need state members to help

- LPC Efforts:
    - Increased press releases and outreach.
    - Joint press releases with NHF&G.
    - 117 presentations in 2017.
    - 20,000 rack cards in 2017: Simple message "give space" and "Fish Lead Free".
    - 2,200 packets of lead free tackle passed out.
    - Loon trouble magnet
- NHF&G is helping with efforts
    - Involvement of regional offices, messages at I-93 rest areas.
    - Programs, publications, fairs, enforcement is all helping.
    - The Northwoods Law TV show episode with the lead loon was a valuable messaging and outreach avenue.
    - 17 warnings were issued, but no citations.
- New Joint Effort (pilot)
    - Tackle exchange.
    - Buy back program.
        - $ for lead – local tackle shops incentives and gift cards.
        - Helps with the friction of the issue.
    - NH Lakes Association
        - Increasing messaging and collection.
    - Putting lead tackle collection bins at transfer stations and recycling stations. There's 4 out so far and will put out 50 more.
        - Look into antique tackle fair? Household hazardous waste collection?
    - Start using lead check swabs? 3M might donate some? Give to Conservation Officers?

Fish Lead Free Initiative - *Susan Gallo, Maine Audubon*

1) Fish Lead Free is Part of "Loon Smart Program" which is similar to the "Lake Smart Prgoram" which has been successful.
2) State-wide efforts done, but Sandborn Pond spill money will continue efforts in the area.
3) Website will be updated this summer.
4) Expand the effort to other states/provinces? How to involve in the 2019 symposium?

Lead tackle & fishing line recycling - *Jillian Whitney, MA DCR*

- Started the project in 2007.
- Lead recycling was limited to hazmat centers.
- Deployed 24 canisters for line, 19 canisters for lead.
    - Boat launches have been the most popular sites.
- Really great success in collections for line.
- 2" PVC works best.
- Materials cost is about $10-20.
- 8 lbs of lead collected in 2017.
- 2018 project directions: Increase the # of canisters and add flaps to prevent cavity nesting birds, etc from using them.

Mortality – Causes, Avoidance, and Restitution

Necropsy cases, mortality database and student projects - *Mark Pokras, Cummings School of Veterinary Medicine at Tufts University*

Example – Cape Cod 2017 Mortality

- Lead in head (shot)
- Object in body on x-ray (large)
- Salpingitis
    - Infection of oviduct – may be first record in wild bird, certainly for a loon.
    - Stabbed during loon fight?
    - Something caused by the lead? Lead impacts contractibility.
- Could have done more with increased funding for pathology, bacteria testing, etc.
- Would have been better as a fresh carcass.
- Something caused a hormonal imbalance to cause an ovary issue?
    - No active follicles, so probably not hormonal issue.
    - Probably had this for 6-8 months. Loons are tough.

Mortality Database Updates

- 30 years of data, need to immortalize it.
- NWDC
    - Large online data base, could it house loon data?
- Canadian Wildlife Health Co-op.
    - Merge datasets?
- One-time cost of transferring google.drive data (cost $8-10k).

Student Projects Update

- Bone Lead
- Loon blood chemistry
- Fishing gear being studied in a rock tumbler
- Asper diagnosis in loons
- Algal toxins
- Sternal puncture paper in progress

Rescue, rehab, and triage of loons - *John Cooley, LPC*

- 18 Total Rescues in 2017
    - 7 Adult Mortalities (5.6 avg)
    - 5 Adult Releases (3.1 avg)
    - 1 not an LPC action
    - 3 Juvenile Mortalities (1.6 avg)
    - 2 Juvenile Releases (1.3 avg)
- Trying to figure out why rescues are happening and opportunity for rehab.

- Work to confirm that loons rescued in previous years are still alive and contributing to population.
- Rescues are helping the breeding population long-term and short-term.
- Increased coordination – volunteers, LPC, rehabbers, and State.
- Some non-NH rescues, giving advice to other states, etc.
- Monitoring poor condition birds in the wild can lead to rescue opportunities.
- There was a group discussion on lead and rescued birds:
    - Treating lead in loons (chelating agents and removal) has promise. Other issues with lead loons?
    - Techniques for removal and treatment.
        - Need to develop and share protocols/procedures **(ACTION ITEM)**
    - Most lead loons are caught too late to treat.
    - Need to band released birds so we can determine fate, improve understanding, and guide actions.
- Working to link rescue data to population/productivity data and individual data.
- Weird loon behavior reported for loon with high contaminants? Injury?

What to do with loon eggs? - *Mark Pokras, Tufts*

Veterinarian Rehab Committee is drafting guidelines for rescued loons, particularly because loons are so poor in captivity.

Toddy Pond Rescued Chicks

- Backstory on the scenario:
    - 1 Adult was killed by an eagle
    - 1 Adult abandoned the nest
    - 1 egg was pipped, 1 egg was not
    - Avian Haven hatched, reared, and released the chicks. The concern is that they have never seen an adult.
    - An older wild loon chick was added to make a trio in captivity and at release.
    - BRI banded the loon chicks before release.
- Should the chicks have been released?
- Should the chicks have been rescued?
- The three chicks were released back on Toddy Pond, apparently they did not approach humans (that day when observed) and they encountered an adult loon without issue.
- Folks monitored the area for days and could not find them, but the head of the Toddy Pond Association saw them one more time later in the fall.
- Ultimately, their fate is unknown.
- What should have been done in this scenario?
    - A single loon can raise a chick – there have been examples of this.
- The BBL's stance on banding rehab birds is "Don't/shouldn't do it".
- There's a need to collaborate with BRI, banders, rehabbers to make banding rehab birds as smooth as possible.
- Danielle D'Auria stated that Maine IF&W feels that the eggs should not have been taken.
- There's policy in place for taking loon eggs both viable vs non-viable.

- This was a case of natural mortality and abandonment. Is pipped still considered an egg or a chick?
- Other eggs were collected in 2017, but failed at raising/hatching in captivity.
- There are egg permitting issues and regulations – discussion.
- The general public is uneducated on these issues – loons are special to the public so a tough scenario.
- Vin Spagnuolo added that there was no observable fear observed in the chicks when captured for banding.

B-120 & joint NELSWG proposal - *Susan Gallo, Maine Audubon*

- Update on B120
    - There was a meeting amongst NELSWG members in December (Minutes).
    - 4,000 loon lives lost.
    - $7.3 million to loon restoration ($13 million for all species).
    - Final approval of the Consent Decree has occurred.
    - Finalized in January and DOI has the $13 million.
    - USFWS is drafting a restoration plan which will take from now through the Fall of 2018 and aims to have a draft plan by year's end.
    - There will be a public comment period followed by an RFP in summer of 2019.
- Key Points:
    - Money to be spread geographically, but focus on Massachusetts where the spill occurred.
    - Short-term vs long-term gains to be considered
    - NELSWG can contribute to the restoration plan through a memo to the committee.
- Discussion between NELSWG
    - Molly Sperduto added:
        - There was a multiplier to estimate the total # of loons killed
            - 530 loons washed ashore
            - Lost bird years was estimated (how long were the 530 missing)
    - Nina Schoch added:
        - Genetics would be key for future spills.
        - Molly: Will look at this in future spills. Used info on visual observations of oiled birds returning to breeding grounds as well as existing migration/winter data, etc.
    - Susan Gallo added:
        - Need to follow-up with Memo
        - Molly wants the memo in 2-3 months. Don't need to spend too much time on it and can utilize the prior NELSWG document.
            - Focus on best ways to put loon years/lives back into the regional population.
    - We have this summer to do collaborative projects to prepare a NELSWG proposal.
        - Conduct social science to evaluate signs/wardening/etc?
    - Rob Alvo suggested we translocate eggs from Canada.
- Discussion on how to do a proposal as a group:
    - Administrator? Umbrella group?

- Molly: It may be that individual entities are funded.
- Susan: Others (non-NELSWG) will apply for funding.
- There is a need for NELSWG umbrella proposal.
- Molly commented:
  - Land acquisition did not achieve goals as expected in previous oil spills.
    - Productivity wasn't as high as expected.
    - BUT, lots of collaborations/partnerships and were able to recover loons.
  - More costly if only oil spill pot of money.
  - USFWS has a different perspective.
  - Trying to not do land protection this time around.
    - There could be an option at a refuge.
    - This could change.
  - Land protection examples: $100 million to do North Cape so $200 million to do B-120?
- A sub-group will continue working on the NELSWG B120 joint proposal and will refurbish the original proposal.
  - Molly added to not spend time on it now.
  - Will need our input on a restoration plan when it is available.
  - Then submit a large joint proposal.
- Trustees of B-120 include: USFWS, NOAA, MA DEP/Governor, RI Governor.
  - There needs to be consensus for awards.
- Distribution of money – there will be guidelines.
  - There will be a sense of allocation in the restoration plan as well as a $ amount.
- Sheridan Brown added: DOI interpretation of MBA – how would this play out in future scenarios?
  - Molly: No guidance yet….just interpretation.
    - OPA – USFWS still has authority and action.
    - Could influence criminal investigations.

Contaminants, Pathogens, and Other

Temporal trends in Adirondack loon Hg Levels - *Valerie Buxton, Adirondack Center for Loon Conservation*

- Background: Control policies and regs enacted – 77% decline in emissions 1990-2014. NE had a notable decline.
- Objectives
  - Investigate patterns in Hg from 1998-2016 – in individuals and lakes.
  - Spatial patterns in ADK.
  - Develop a sampling pattern for detecting changes.
- Average of 21 lakes sampled and 36 females/year.
- 1998-2016: Annual increase, but then from 2010-2016 Hg leveled off.
- 2008 for Juveniles and 2006 for eggs – Hg leveled off.
- Moderate risk exposure for females and eggs.

- Birds captured with less than 2PPM blood Hg tended to increase, birds captured with greater than 2PMM tended to decrease over time.
- Some lakes had declining trends in Hg.
- The south and western portions of the ADKs may be higher in Hg.
- Power analysis to determine the ability to detect a 5% change.
    - 10 Lakes for 15 years – 3 females sampled per lake.
    - Lake PH influences?
- There was no clear pattern in recaptured birds.
- Geology may play a role in Hg.
- Ocean Hg changes and how to monitor this?
- Pointed out that previous Hg research influenced this research.
- Need to re-evaluate this all every 5 years – dependent on NYSERDA funding.

Lake acidification and related threats - *Rob Alvo*

- Acidification issues/concern started in NH (Hubbards Brook) and Europe.
- David Hussel was influential to loons and acidification research.
- Joe Kerekes – wants to work loons into limnologists work as a study species.
- In the 1980s there was an Ontario-wide loon acidification survey effort (OLLS/CLLS)
    - There were 80 lakes with focused effort.
- ADK/ON studies complimented each other (1988 publications).
- Loon breeding success is impossible at lower than 4.5 pH, effects at 6.0 pH.
- Published a 25 year study in CA Field Naturalist (2009).
- CA Prime Minister Harper cut pH monitoring in Canada. Not sure of pH trends.
- Rob is looking for someone to take over the study of Boreal Lakes – are they warming faster?
    - Found a professor (Mark Mallory) at Acadia University.
        - Will combine limnology and birds.
- Bird Studies Canada – Doug Tozer is directing funding towards loons. Has 70% of the funding.
- Perhaps we need to bring attention back to acid rain?
- Looking to add loon capture to the study for Hg monitoring.

Food web transfer of cyanotoxins - *Jim Haney, University of New Hampshire*

- Looking at transfers and mechanisms in loons.
    - Microcystins and BMAA
- New paper in Sweden and fate of BMAA in birds – radioactive tracking in lab quail.
    - Liver/kidneys to follicles/egg to egg.
    - Eggs as indicators of bird condition, eggs are a repository of biotoxins.
- BMAA in loon eggs.
    - We can measure it.
    - Is it time/location/bird dependent? Can we generalize?
- New Grant (Haney & Kneeland)
    - Do biotoxins bio-magnify?
    - Plankton and loons food-chain effect

        - How efficient is first trophic level transfer?
    - Feathers are complicated, so switched to blood.
        - BMAA relationship, but not as much or at all for microcystin.
- Are cyanotoxins harmful to loons?
    - LDH-microcystin relationship
    - Multiple factors at play
- Picoplankton can aerosolize and create other chain bypass.
- Toxic aerosols
    - Cells and toxins at air water boundary
    - Link of aerosol toxins and ALS and other neurodegenerative diseases in study area (South Freeport)
    - Developed and using a Flow Cytometer to "see" aerosolizing
        - Did prove aerosols
        - Cyanobacteria movement mechanisms – they move fast (relatively)
- Next questions:
    - Is there a transfer from marine systems?
        - Look at this in adults and eggs?
    - Compare contrasting lake systems.
    - Gannet die-off in the Gulf of Maine – had high BMAA/MC. Same with shearwater die-off.
    - Mechanism for dispersal? Aerosolizing?
    - Squam Lake contaminants peak matched high levels of BMAA in eggs.
    - Synergistic effects of BMAA and Hg and other contaminants.

Squam Lake Loon Initiative update - *Tiffany Grade, LPC*

- Squam in 2017: 2 mortalities (paired adults) and a Juvenile (migrant) died.
- Lead issues – increasing rate on Squam.
- Continued poor productivity.
- Social chaos theory continues.
    - 3 nests abandoned after territory intrusions
    - 1 nest failed due to intrusions and black flies
    - 2 nests over-incubated
    - 2 predations, 2 unknown, and eggs kicked out of 1 nest by loon
- Continued contaminant testing.
    - Followed tributaries.
    - Fresh DDT detected (new application or remobilization)
    - One tributary is high in contaminants
- NH DES is now involved following that source/location being identified.
    - DES Action Items
        - Culverts (state investigation) – Not in good condition
        - Fish Study – need full contaminant analysis.
        - More sediment sampling.
        - Land history/surveys
        - Loon eggs
- 2016/2017 Egg results

    - 1 egg up to mid 2000s for flame retardants.
        - The female was killed by a boat strike.
        - Also high with PCBs.
    - 3 new eggs, 1 reference egg, 4 earlier eggs retested.
- Next Steps
    - Continued work with group
    - 2 year lag time in system?
    - Banding and eggs work. Eggshells work.
    - Nest cams
    - Limnological understanding of Squam needs to improve.
- NHF&G hasn't got good fish data.
    - Stable isotope studies do not suggest radical change in fish populations.
- Contaminants paper
    - 45 Squam eggs, 33 reference eggs.
    - PBDEs, PCBs, PCDDF, PFOS, etc.
    - Productivity and contaminants analysis
        - Nest out comes, individual performance, egg measurements.
- Testing arichlors alone won't reveal contaminant issues.
- Canobie Lake egg highest PFOS for all eggs. Extreme levels in reference to other studies.

Fish populations and loons - *John Cooley, LPC*

- NHF&G sampling, 1997-2015, 158 Lakes.
- Evaluate loon and fish datasets combined.
    - Abundance and productivity
    - Focus on yellow perch
    - Catch per unit effort – good measure
- Proportional stocking benefits
    - Big fish to small fish
- Not much difference in fish levels for present/absent lakes, but lakes not monitored have fewer perch.
- Lower proportional stocking density for lakes with loons.
- Over-fished data from Marine ecosystem is applicable?
- Bias due to sampling bass habitat?
    - NHF&G does random community sampling.
- "Preferred" fish on present lakes – poorer quality.
- Loons affecting fisheries?
- Fish metrics lack correlation with loon productivity.

Breeding or Lack Thereof

Climate change vs. loon chicks in NH - *John Cooley, LPC*

- Climate change threatens possible northward shift of common loon breeding populations
- Hatch rate negatively associated with increased ambient temperature and precipitation
- A predictive model using precipitation, daily high temp, precip. 48 hour max (extreme rain events), road abundance, latitude, previous nesting success, and territory type as covariates was used to determine impacts of climate change on breeding loon populations.
- Results showed that human presence and warmer temperatures are not highly correlated.
- LPC is currently working on quantifying the effects of different shade regimes and cover types on rafts, as a potential means to mitigate warming effects.

Potential impacts of climate change - *Mark Pokras, Tufts*

- Mark passed around some musings about climate change and essentially some guiding factors that affect the ranges of species in general and we discussed the effect of these factors on common loons in an age of climate change.
- Temperature undoubtedly is a factor moving forward, but more specifically temperature concerning **nesting** loons, some thoughts we had for monitoring were:
    - Documenting the orientation of nests with regard to the daily direct sun exposure.
    - Documenting the level of shade or cover nests have, even casually, as this may potentially affect nesting success.
    - Documenting hours of direct sunlight on nests.
- Emerging diseases are another factor predicted to increase in Common Loon breeding populations with climate change and are another factor which effects range sizes in biota generally. Notable examples include:
    - Algal toxins from cyanobacteria
    - Fungal infections such as *asper* and *Cryptococcus*
    - GI parasites- thorny-headed worms (*Acanthocephla*)
    - Avian malaria
- Genomic plasticity, do loons have enough genetic diversity within populations on their southern range to be able to adapt to additional burdens of climate change?
    - K selected species such as loons may be particularly vulnerable.
- Competing species and increased predation are also concerns that may come with a changing climate.

MA translocation effort 2015-17 - *Michelle Kneeland, BRI*

- Initiative to restore common loons to their historic range in SE Massachusetts

- A total of 24 loons have been translocated between 2015-2017
    - 15 of these loons were captively reared and 9 were directly released into the Assawompsett pond complex in SE mass.
    - Captive reared chicks were captured at 4-6 weeks of age were held in aquatic pens, fed a regiment of fish, and released onto the Assawompsett Pond Complex at 8-9 weeks of age.
    - Reared chicks on average experienced a 28% increase in weight during rearing.
    - Captive chicks tended to stay on the lake longer after release than chicks that were directly released on the lake.
- So far one immature loon has returned to the lake in 2017 (banded and released on the lake in 2016). This individual was directly released rather than captively reared.
- 2018 will be the first year that any adult breeding loons could be expected back on the Assawompsett Pond Complex since their initial releases in 2015.

Signs and ropelines analysis - *John Cooley, LPC*

- A direct comparison of nests without any form of signage to those with any type of signage showed a success rate of 65% for nests with signage compared to 64% without any signage.
- A more detailed general linear mixed model was created to dig further into this result and showed that there is some positive benefit to using signage but that it is really dependent upon a myriad of factors specific to each nest. Question is how would signed nests have done had they <u>not</u> been signed?
- Discussion ensued about this for some time, which got at the same result that nest signage success is highly variable depending on the nest and general attitudes of people on the lake.

Loon Webcam - *Susie Burbidge, LPC*

- Web hosted nest cameras using YouTube and a hosting service.
- Camera set up was equipped with a microphone as well as remote pan and zoom, which greatly increased the quality of footage over game cams.
- Generally, it was very well received and a lot of great footage was archived.
- One drawback was that the site needed constant monitoring in order to keep the internet trolls at bay.
- Moving forward LPC would want a full time volunteer moderator for the site in order to keep up with internet trolls and to be able to answer questions for the public.

The Future

Other research reports and ideas/Research, management, and outreach priorities - *All*

- Rob Alvo put out a call for any small research notes for publication, i.e. odd occurrences and observations,
- Eagle Observation Database or general NELSWG notable occurances database

National loon conference in 2019 - *Vin Spagnuolo, BRI*

- October 30 – Nov 1, 2019
- International Conference dedicated to all things Gaviidae, research, education, monitoring, art, etc.
- In need of fundraising and abstracts, abstract deadline January 2019.

NELSWG future directions - *All*

- Eagles on Loons Sub-group, Lee Attix
- B-120 Sub-group, USFWS, LPC, Maine Audubon, MA DCR, ADKCLC, BRI, VCE, MA Wildlife, Mark Pokras

Other business/next meeting – *All*

Next Meeting- March 21-22, 2019