

SCAUP ACTION TEAM

Annual Newsletter

Winter 2009

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THE SCAUP ACTION TEAM

Welcome to the first annual newsletter of the Scaup Action Team (SAT).

The Scaup Action Team was developed following the 2006 Scaup Workshop to provide a forum to foster communication and coordination among researchers and managers, integrate new results, discuss emerging issues, and keep scaup at the forefront of management concerns. The Team

functions as a sub-group of the NAWMP Science Support Team (NSST). The prospectus for SAT was formally endorsed by the NSST of the North American Waterfowl Management Plan in 2007.

UPCOMING SAT MEETINGS

SAT will meet twice in 2009, in association with 2 other meetings. Everyone interested in scaup is welcome to attend. If interested in more information, giving a presentation, or having materials distributed at the meeting, please contact Jane Austin (jaustin@usgs.gov).

**Atlantic Flyway Technical Section,
Tidewater Inn, Easton, MD – 24 Feb 2009,
19:30-22:00**

**5th North American Duck Symposium
(NADS 5), Toronto, Ontario – 17 Aug 2009,
Meadowvale Resort and Conference
Center, 13:00—16:30 (SouthStudio 2)
www.northamericanducksymposium.org**

NADS 5 Special Plenary Session: Riches of the Boreal Forest: Waterfowl Populations & Conservation Challenges

The boreal forest of Canada and Alaska is a vast, largely unspoiled ecosystem with extensive wetlands that provide critical habitat for breeding, molting, and migrating waterfowl and waterbirds, and in particular scaup. We have organized this plenary session to bring more awareness of the issues affecting this region, not only for scaup but also other species for which this region is an important breeding ground.

The objective of this plenary session is to explore and discuss the trends in breeding populations, breeding ecology, and conservation and management challenges for waterfowl in the boreal forest. The session will include 6 invited papers of 20 min each. Topics of invited papers include:

Trends in breeding waterfowl populations in the western boreal forest
Modeling population responses to changing climate
Impacts of disturbance regimes on duck community
Linkages among waterfowl survey and other population data in the eastern boreal forest
Perspectives on breeding ecology of scaup in boreal Alaska
Conservation challenges for waterfowl in the boreal forest

For more information about NADS 5 and this session, go to <http://northamericanducksymposium.org/> or contact Jane Austin.

Notes from 1st SAT meeting

Baton Rouge, LA -- Feb 2007

The first meeting of the Scaup Action Team met on 27 and 28 February at Baton Rouge, Louisiana, in concert with the Mississippi Flyway Technical Committee. Thirty-six biologists from the U.S. and Canada attended, including individuals from all four flyways. Objectives of the meeting were to assess progress on scaup issues identified in the 2006 scaup workshop, highlight new activities and information, identify action items to further advance scaup information and research needs, and formally elect a chair and vice-chair for the next two years.

Updates on recent scaup related activities included a review of scaup harvest strategy model (Frank Rohwer, Delta Waterfowl Research Station); the 2007 banding pilot study and plans for 2008 (Scott Boomer, FWS); development of a comprehensive scaup conservation action plan (Jane Austin, USGS); retrospective analyses (Stuart Slattery, Ducks Unlimited Canada, and Scott Boomer, FWS); breeding demographics (Stuart Slattery, Ducks Unlimited Canada, for Bob Clark, CWS); preliminary assessment of techniques to determine breeding propensity in late-season birds (Mike Eichholz, Southern Illinois University); migration and wintering ecology - Great Lakes satellite telemetry and selenium studies (Jane Austin, for Shannon Badzinski, Long Point Waterfowl and Wetlands Research Fund); Lower Mississippi satellite telemetry study (Al Afton, USGS, Louisiana Cooperative Fish and Wildlife Research Unit); and winter surveys, and development of tools for greater/lesser scaup identification in the field (John Barclay, University of Connecticut).

Action items: Five action items were identified: 1) Harvest model and explore potential alternative

models (Mark Koneff), 2) Banding 2008 and beyond (Scott Boomer and Mark Koneff), 3) Retrospective analyses (Stuart Slattery and Scott Boomer), 4) Use of post-ovulatory follicles to assess breeding propensity (Mike Eichholz), and 5) Development of audio-visual resources to improve species delineation by biologists and hunters (John Barclay). These individuals were charged with developing scoping documents on what would be needed to move these issues forward.

Other business: Jane Austin and Steve Cordts were elected to 2-year terms as Chair and Vice-Chair, respectively. Steve will succeed Jane as Chair in 2010.

It was agreed that having a smaller, core group for interim discussions and guidance of SAT actions and planning would be valuable. Jane Austin was charged with the formation of an Advisory Board to the Chair and Vice-Chair, and solicit board members. Proposed member structure would include representation of FWS, Canada, and the four flyways (more information on this is elsewhere in this newsletter).

Next SAT meeting: Information about upcoming SAT meetings for 2009 is posted later in this newsletter.

SCAUP CONSERVATION ACTION PLAN

Jane Austin, USGS-Northern Prairie Wildlife Research Center

Mark Koneff, US Fish and Wildlife Service, Division of Migratory Birds

Issues surrounding the management of scaup have become increasingly contentious over the past several years. Efforts to objectively address concerns about declining scaup populations have progressed on several fronts: the establishment of a Scaup Action Team under the auspices of the North American Waterfowl Management Plan Committee; development of an initial scaup harvest management strategy by the U.S. Fish and Wildlife Service in consultation with the Flyways; and, most recently, work initiated to develop a comprehensive conservation plan for greater and lesser scaup through USGS-Northern Prairie Wildlife Research Center.

The purpose of the conservation planning project is to use principles of structured decision-making to develop a strategic, biologically-based framework to recover the North American scaup population. We view this process as complementary to efforts to improve harvest management decision making; however, in no way do we envision this process as

usurping the normal regulatory procedures or the Flyways' role in setting harvest policy. Efforts to refine the current scaup harvest strategy will continue on a parallel track. Ultimately, we hope that, in the spirit of the Future of Waterfowl Management Summit, these two distinct but complementary tracks merge.

A critical part of the conservation planning process we envision is a series of workshops that will involve national, regional, and state experts and decision-makers to develop a decision framework. The first workshop will be held on 2-6 February 2009 at Patuxent. The objective of this workshop is to develop a rapid prototype of the decision framework for the annual cycle at the continental scale, i.e. define management objectives, identify uncertainties and potential management actions, develop system models, and identify monitoring and information needs. The scope of the first workshop will be very broad, covering continental issues for both species including population ecology, habitat management, and harvest management. The elements of the prototype decision framework that emerges from the first workshop will be reviewed and refined in two subsequent workshops focused on the breeding grounds (scheduled for early April) and migration/wintering grounds (scheduled for August or September). Results from workshops will provide the foundation for the scaup conservation action plan that will integrate conservation and management decisions throughout the annual cycle and across geographic regions.

Clearly, harvest management and other issues of direct interest to the Flyways must be brought to the table for discussion. However, past experience in applying the principles of structured decision-making to complex management problems has repeatedly reinforced the importance of starting the process with a small group (8-10) of knowledgeable participants. Participants invited to each workshop will include individuals who can represent and articulate issues and decisions about continental or regional habitat management (USFWS, CWS, Ducks Unlimited, Joint Ventures), continental population management (USFWS-Division of Migratory Birds and CWS), and flyway and state level population and habitat concerns (individual appointed by the National Flyway Council {NFC}). The participants of the first workshop included Dale Humburg (DU), Hal Laskowski, Sean Kelly, and Scott Boomer (USFWS), Jeff Lawrence (Minnesota Department of Natural Resources and NFC representative), Bob Clark (Environment Canada), Stuart Slattery (DUC), and Dave Howerter (Ducks Unlimited Canada and Prairie Habitat Joint Venture). Greg Soulliere (Upper Mississippi River/Great Lakes Joint Venture) and John Coluccy (DU) participated in two pre-workshop conference calls to draft the problem statement and

objectives, but because of scheduling conflicts were unable to attend the workshop. Jim Lyons and Bill Kendall served as facilitators. A report from this workshop will be provided to participants of the second and third workshops so they can refine and expand upon the rapid prototype decision framework, models, and issues.

The scaup conservation action plan must be built through active participation and input from the waterfowl community. To ensure a comprehensive and acceptable plan to stakeholders, we will strive for transparency and full opportunities to provide input, comments, and discussion. To facilitate communications, Jane Austin has established a Scaup Community "wiki" online that will be accessible by all workshop participants and the advisory board of the Scaup Action Team (which includes all flyway diving duck chairs), among others. This interactive website allows sharing of draft and reference documents, reports from the workshops, and a forum for discussions. Periodic updates on the planning progress will be provided through various avenues, including communiqués with the National Flyway Council, the NSST quarterly newsletter, presentations at the Atlantic Flyway Technical Section meeting in late February and the North American Duck Symposium in August.

RESEARCH

Scaup research in South Dakota

Spencer Vaa, South Dakota Game, Fish, and Parks, spencer.vaa@state.sd.us

Two Masters' students, Rachel Mockler and Kimberly Strand, plus PhD student Sharon Njambi Kahara, have completed scaup research studies at South Dakota State University. Rachel's thesis, *Lesser Scaup Use of Wetlands in Eastern South Dakota*, was completed in 2004. Kimberly's thesis, *Diet and Body Composition of Migrating Lesser Scaup in Eastern South Dakota*, was completed in 2005. And Sharon's dissertation, *Modeling Wetland Use by Spring Migrating Lesser Scaup in Eastern South Dakota*, was completed in 2007. To access these documents, go to <http://wfs.sdstate.edu> and click on *Resources*, and then *Theses and Dissertations*.

It is interesting to note that all 3 students are recipients of the Central Flyway Council's Gay Simpson Memorial Award. This prestigious award recognizes students who have demonstrated outstanding research in the ecology or management of Central Flyway waterfowl or their habitats.

Does Physiological Condition affect Reproduction of Lesser Scaup in the Boreal Forest of Alaska?

Kristin DeGroot (fnkad@uaf.edu), Mark Lindberg, and Perry Barboza, University of Alaska-Fairbanks, in cooperation with Mark Bertram, US Fish and Wildlife Service, Yukon Flats National Wildlife Refuge

In order to address concerns posed by the Spring Condition Hypothesis, our study will examine the relationship between body condition and several reproductive parameters for lesser scaup nesting on the Yukon Flats National Wildlife Refuge, Alaska.

We will use both capture-resight methods and lethal means to determine body condition and reproductive success of females. In 2007 and 2008 birds were captured upon arrival, marked with radio transmitters, and located 1–2 times per day to determine breeding probability, clutch size, and nest success. We measured body condition of marked birds using an oral dose of labeled water (D_2O). This method measures total body water space and, therefore, total body lipid. We found that five birds initiated nests in 2007 and three in 2008. None of these nests were successful.

Blood plasma samples from marked birds ($n=33$ and 39 birds in 2007 and 2008, respectively) and whole bodies of collected birds ($n=47$ birds for both years) will



be processed in the lab to determine body condition and reproductive status for each individual. We will measure levels of the yolk precursors vitellogenin and very low density lipoprotein in plasma to determine if birds have entered Rapid Follicle Growth (RFG). For collected birds, we will also examine ovarian follicles. We will then examine the relationship between body composition and several reproductive parameters (RFG status for all birds; breeding probability, clutch size, and nest success for marked birds).

We also hope to determine relative contributions of endogenous and exogenous nutrients to eggs by measuring stable isotopes (^{13}C and ^{15}N) in eggs and follicles, somatic muscle and lipid, and food sources collected on the breeding grounds. Results are forthcoming in 2010.

Tracking Scaup by Satellite from the lower Great Lakes

Shannon Badzinski, Research Biologist, Long Point Waterfowl, Port Rowan, Ontario, sbadzinski@bsc-eoc.org

Since spring 2005, Long Point Waterfowl (LPW) has used satellite telemetry to study various aspects of the migration ecology of lesser scaup (LESC) and greater scaup (GRSC) captured from the lower Great Lakes (LGL). There were 3 major objectives for this research, to determine: 1) spring/fall migration pathways and identify important spring staging areas/stopover sites, 2) breeding and winter distributions of LGL scaup, and 3) spring migration chronology, specifically the time required for females to arrive at breeding sites after departing the LGL. To date, we have implanted 35 LESG (2005=6; 2006=18, 2007=11) and 11 GRSC (2006=2; 2007=9) at Long Point – Lake Erie and Hamilton Harbor – Lake Ontario. Presently, there are 15 (9 female LESG, 3 male LESG, and 3 female GRSC) transmitters still active, which allowed us to determine where and how scaup traveled across the landscape between this past (2007/2008) winter and spring.

Similar to past years, most LESG spent winter 2007/2008 in Florida and the Caribbean. One male LESG wintered in southern Louisiana where it spent the winter the previous year. Eleven of the 12 LESG that wintered in the southeast US/Caribbean passed through the LGL region during spring either directly or via the east coast of the US; one bird by-passed the LGL but used Lake Superior before arriving in northeast Manitoba. The bird wintering in Louisiana migrated up the Mississippi River, across the prairies, through the boreal forest to settle far north on the McKenzie River Delta, Northwest Territories. The other LESG dispersed after departing the LGL region and were widely distributed throughout the eastern and western boreal forest from Alaska to Newfoundland.

During 2007/2008, 5 GRSC survived the fall and migrated to wintering areas in eastern North America. Four birds returned to Lake Ontario (3 to Hamilton Harbor) and 1 bird wintered in Massachusetts. These results suggest that philopatry is relatively high to wintering areas on the LGL, but that some birds do continue on to traditional wintering areas on the east coast of the US. Of these 5 birds, only 3 survived the entire spring migration; one died during winter in Massachusetts and 2 died partway through spring migration (Bay of Quinte - Lake Ontario and Saginaw Bay – Lake Michigan). In spring 2008, all 3 surviving birds traveled northwest with 1 bird stopping near Buffalo Narrows in west-central Saskatchewan and 2

birds continuing on to settle into western Alaska for the summer.

Combined with data from other years, these observations show and reconfirm that the LGL provide important spring staging habitat for GRSC and LESC that continue on to breed throughout North America. Although not reported here, this study also has provided us with data on fall migration of scaup. Given that 15 satellite transmitters are still active, and should remain so for at least another migration, we will continue to learn much more about the seasonal mysteries of LESC and GRSC. A more detailed report, distributed earlier in 2008 to the Scaup Action Team, on the most recent results of this and other LPW scaup research is available upon request.

Selenium Uptake and Effects in Greater Scaup Wintering on Western Lake Ontario

Lindsay L. Ware, University of Western Ontario, London ON, lware@unity.edu

The combined continental population of greater and lesser scaup has declined substantially since the mid-1980s. One possible explanation for the decline is that birds are acquiring elevated levels of contaminants during winter, and this is subsequently impacting their health, reproduction, or survival. High levels of the trace element Selenium (Se) have recently been detected in scaup staging on the LGL. It is believed that scaup are acquiring excess Se by feeding on two species of invasive filter-feeding mussels, the zebra mussel and the quagga mussel. Because large concentrations of Greater Scaup (GRSC) winter on Lake Ontario, Lindsay's research investigates the effect that Se has on the health and body condition of this species. Our research is focused on the wintering period because overwintering birds spend long periods on the LGL and so may obtain particularly high burdens of Se. We also examined two probable avenues of contaminant transfer, zebra and quagga mussels.

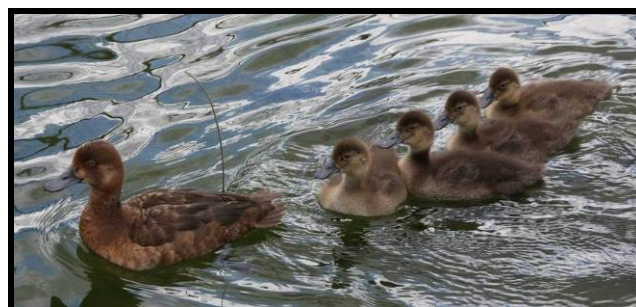
During the winters of 2006 and 2007, we collected blood, feather, and liver samples from GRSC in Hamilton Harbour and tested them for several contaminants, including Se. The body condition of the GRSC was also determined, and each bird was examined for physiological abnormalities. While all of the GRSC contained very high Se burdens, these burdens do not appear to be related to decreased body condition or other aspects of health. Therefore, there is not yet evidence that high Se burdens are negatively impacting GRSC health.

Zebra and quagga mussels were also found to have high Se burdens, containing about three times

the amount of Se normally considered safe for consumption by wildlife. However, the Se concentrations in the water of western Lake Ontario were very low. This suggests that very high biomagnification is occurring between the water and the mussels, and that GRSC in western Lake Ontario would most likely not be exposed to such high Se levels if not for the extremely high water-filtering capacity of zebra and quagga mussels.

Effects of Surgically Implanted Transmitters with Percutaneous Antennae on Breeding Behavior of Captive Seaducks and Lesser Scaup

Matthew C. Perry, Alicia M. Wells-Berlin, and Glenn H. Olsen, USGS, Patuxent Wildlife Research Center, Laurel, MD, mperry@usgs.gov



Captive White-winged Scoters (*Melanitta fusca*; WWSC), Surf Scoters (*Melanitta perspicillata*; SUSC), and Long-tailed Ducks, (*Clangula hyemalis*; LTDU). at Patuxent Wildlife Research Center in Laurel, Maryland, USA, were instrumented with 26-g and 39-g dummy PTT-100 transmitters (Microwave Telemetry, Inc.) to determine the long-term influence of surgically implanted satellite transmitters. Lesser scaup (*Aythya affinis*; LESC) were also used as surrogates for seaducks due to their known ability to produce large numbers of eggs in captivity. All ducks were paired by "free-pair bonding" in pens with 4-7 ducks each and then individual pairs were placed in separate pens. Pairs were randomly selected for instrumentation or for control. Instrumentation was conducted in a veterinary hospital at Patuxent and controls were handled similarly except for surgery. Females were instrumented for all species except for SUSC where males were used due to low sample size of females.

Behaviors were recorded by observers outside of pens during the 2007 and 2008 breeding season (April-June) for LESC and in 2008 (April-June) for WWSC and SUSC. No differences ($p > 0.05$) between

the instrumented and the control ducks were detected for major groups of behaviors for WWSC and SUSC. However, there were differences for LESC for reproductivity between controls and both groups of ducks with transmitters during spring (2008). Differences were mainly due to increased incubation for controls.

In 2007, control LESC females laid 8.2 eggs per duck and instrumented females laid 3.8 eggs per duck. The instrumented ducks laid 16 malformed eggs, whereas no malformed eggs were laid among control ducks. In 2008, control ducks laid 8.7 eggs per duck, whereas ducks with 39-g transmitters laid 7.0 eggs per duck and those with 26-gram transmitters laid 7.3 eggs per duck. Ducks with 39-g transmitters laid 15 malformed eggs and ducks with 26-gram transmitters laid 10 malformed eggs. No malformed eggs were laid by controls.

Statistical analyses on the length, width, and weight of eggs indicated that there were differences ($p < 0.05$) between the instrumented and control ducks (Table 1). Some of the malformed eggs were not measured because they were crushed or had no eggshell. Transmitter position near the oviduct appeared to be affecting the shape of the egg, but size of transmitter did not appear to be a factor in causing the malformed eggs, as number and degree of malformed eggs was similar for both groups of ducks with 39- or 26-gram transmitters.

Table 1. Lesser scaup egg production and measurements spring 2007 and 2008.

	Total/Mean Eggs Laid	Ave. Length (mm+1SD)	Ave. Width (mm+1SD)	Ave. Weight (g+1SD)
2007 - Control (n=5)				
	41/8.2	55.7±1.8	39.7±1.0	48.3±4.1
2007 - Instrumented (39 g) (n=5)				
	19/3.8	58.3±3.2	38.3±1.4	45.2±6.2
2008 - Control (n=3)				
	26/8.67	55.7±1.8	39.6±0.8	46.3±5.8
2008 - Instrumented (39 g) (n=5)				
	35/7.00	57.4±2.4	39.8±2.1	47.2±9.4
2008 - Instrumented (26 g) (n=4)				
	29/7.25	59.8±2.8	39.6±1.4	50.7±6.3

An unexpected finding was that one of the five female lesser scaup ejected the 39-g dummy transmitters through a hole in the skin at antenna site, and another female has partially ejected the transmitter. Surgical attachment has been modified to prevent loss of transmitters.

Using Stress Biomarkers to Evaluate Lesser Scaup Habitat Quality and Landscape Attributes

Karen Machin, University of Saskatchewan,
karen.machin@usask.ca

Birds were collected from two areas of the western boreal forest from Athabasca to Cold Lake (Ath-CL) and Slave Lake to Utikama Lake (SL-U), Alberta. The Ath-CL area can be described as the fringe between agricultural land and boreal forest with ongoing permanent removal of the forest and draining of bogs for acquisition of pasture and alfalfa production. In comparison, the SL-U region is impacted more by oil and gas with fragmentation of the forest by multiple seismic lines, roads and oil pads. Comparison of habitat quality and landscape along with collection of physiological variables (follicle corticosterone and stress related metabolites) are ongoing.

The 1st collection took place between May 14th and May 21st and the second (in roughly the same areas) was between June 5 and June 11. Number of female scaup collected by site and collection period are shown in the table below:

	SL - U	Ath - CL
May	10	7
June	21	25

Ovaries were examined and the number of rapidly growing follicles (RGF > 1g) and post ovulatory follicles (POF) were counted. Rapidly growing follicles were weighed and stored for CORT analysis. The reproductive tract was also examined for the presence of ovulated eggs (O) and eggs.

Preliminary Results:

Body Size and Condition: Morphometric measurements (culmen length, wing cord and tarsal length) were used to derive an index of body size using principal component analysis. There was no significant difference between body sizes from SL-U or Ath-CL regions in either the May or June collections ($P = 0.272$ and $P = 0.726$, respectively). Body mass was regressed against PC1 scores of structural size ($R^2 = 0.210$, $df = 61$, $P < 0.0001$), and residuals from this relationship were used as an index of body condition. In both May and June collections, SL-U birds were in better body condition than those from Ath-CL ($P = 0.042$ and $P = 0.023$, respectively).

Ovarian Development: Scaup females collected in the SL-U region had significantly greater ovarian development than birds in the Ath-CL region ($P < 0.0001$). Follicle development was measured as a

OTHER NEWS & NOTES

Scaup Parasites

Steve Cordts, Minnesota Department of Natural Resources, Bemidji, MN,
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In November 2007, an estimated 6,000–7,000 scaup died on Lake Winnibigoshish in north-central Minnesota as a result of trematodes. A smaller die-off occurred again in November 2008, when an estimated 2,000 scaup died. Similar losses have occurred on the Mississippi River pools in southeast Minnesota each fall and spring since 2001. The trematodes that cause the mortality require snails as intermediate hosts to complete their life cycle. After scaup forage on infected snails, the trematodes mature into adults that attach to the lining of their intestinal tracts. Adult trematodes shed eggs via the birds' feces and into the water, which continues the trematode life cycle. Scaup that are infected with many trematodes become lethargic, have difficulty flying, and eventually die due to blood loss.



Dead scaup on shore of Lake Winnibigoshish

The faucet snail (*Bithynia tentaculata*) was discovered in Lake Winnibigoshish during summer 2008 and has been involved in all other scaup/trematode die-offs in the U.S. This is the second known location in Minnesota but it is probable that the snail may be present, or could spread, to additional lakes in the future. Staff with the Minnesota Dept. of Natural Resources, USGS National Wildlife Health Center, and other agencies will continue their monitoring efforts.

the total number of rapidly growing follicles (RGF), post-ovulatory follicles (POF), and oviductal eggs (O) per ovary (Fig 1) and ovary mass (Fig 2). Only 48% of birds from the Ath-CL had follicular development while 90% in the SL-U region. Ovary mass was significantly greater in birds from the SL-U region in comparison to those from Ath-CL ($P = 0.003$) indicating that ovaries were far more developed (i.e. more RGF and great number of developing smaller follicles). It is worth noting that only 43% of Ath-CL birds had follicular development June 5-8 but 3 of 4 birds had follicular development June 13th (smaller second collection to determine reproductive status). The majority of birds had yellow eyes, which may indicate birds are likely 2 years of age; comparison to wings from known age birds is to follow to help confirm age assignment.

Fig 1. Ovary Development of Female Lesser Scaup shot in Alberta June 2008. Number of developing Rapidly Growing Follicles (RGF), Oviductal Eggs (O) and laid eggs as indicated by Post-Ovulatory Follicles (POF)

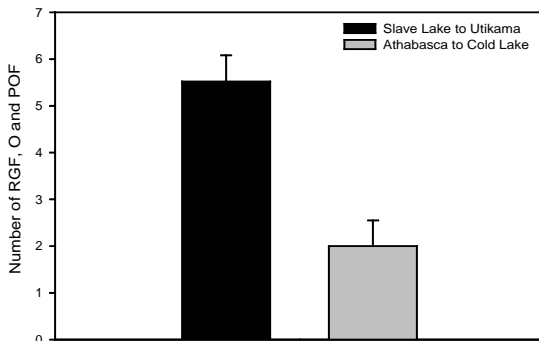
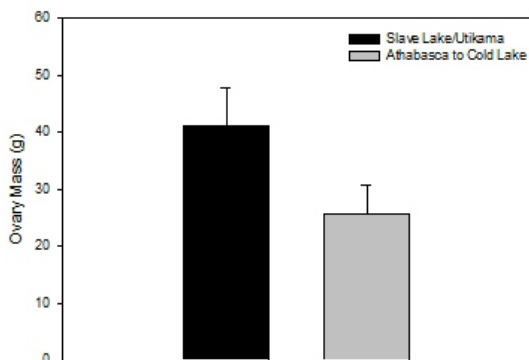


Fig 2. Ovary Mass of Female Scaup from Alberta June 2008.



Establishment of SAT Advisory Board

The Advisory Board provides the Chair and Vice-Chair with informed guidance and support to advance the mission of SAT. The Advisory Board serves to make recommendations, provide key information and materials, and serve as a sounding board to the Chair and Vice-Chair, with an emphasis on direction, prioritizing, planning, and agenda setting.

The Advisory Board's ability to provide valuable advice relies on the commitment, expertise, and scientific knowledge, and experience of the members. The Board consists of representatives of NAWMP, Canada, the U.S. Fish and Wildlife Service and each of the flyways, and additional at-large members. At-large members are selected by the Chair to ensure representation of the other institutions or key issues. The Chair or Vice-Chair may simultaneously serve in one of the set representation positions (e.g., Chair and a flyway representative). The Board composition for 2008–2009:

Chair: Jane Austin, USGS-Northern Prairie Wildlife Research Center

Vice-Chair: Steve Cordts, Minnesota Department of Natural Resources

Advisory Board Members:

NAWMP: Mike Anderson, Ducks Unlimited Canada

USFWS: Mark Koneff, US Fish and Wildlife Service, Division of Migratory Bird Management

CWS: Bob Clark, Environment Canada

Atlantic Flyway: Joe Fuller, North Carolina Wildlife Resource Commission

Mississippi Flyway: Steve Cordts, Minnesota Department of Natural Resources

Central Flyway: Spencer Vaa, South Dakota Game and Fish Department

Pacific Flyway: Don Kraege, Washington Department of Fish and Wildlife

At-large members:

Stuart Slattery, Ducks Unlimited Canada
Shannon Badzinski, Long Point Waterfowl
Jim Lovvorn, University of Wyoming
Mark Lindberg, University of Alaska

Updated Lesser Scaup Bibliography Online

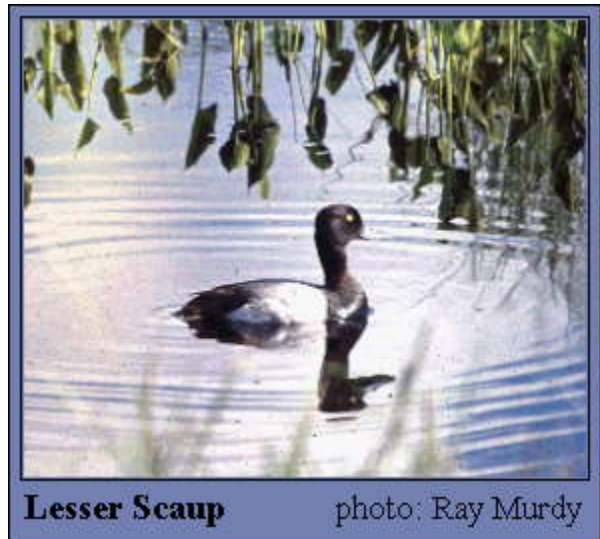
A bibliography containing over 1500 citations relating to lesser scaup is available online at

<http://www.npwrc.usgs.gov/resource/literatr/scaupbib/index.htm>. This collection has been developed over 25 years and covers a wide variety of sources, including unpublished reports and other gray literature. It is a Word document and is up-to-date through December 2008. Key words (in italics) follow each citation, providing more specific information and allowing more thorough searches for information of interest; they also indicate whether information on greater scaup (*Aythya marila*) is included. Additions and corrections are welcomed.

SCAUP PUBLICATIONS – 2008

- Anteau, M. J., and A. D. Afton. 2008a. Amphipod densities and indices of wetland quality across the upper-Midwest, USA. *Wetlands* 28:184–196.
- Anteau, M. J., and A. D. Afton. 2008b. Diets of lesser scaup during spring migration throughout the Upper-Midwest are consistent with the spring condition hypothesis. *Waterbirds* 31:97–106.
- Anteau, M. J., and A. D. Afton. 2008c. Using plasma-lipid metabolites to index changes in lipid reserves of free-living lesser scaup (*Aythya affinis*). *Auk* 125:354–357.
- Beyer, W. N., M. C. Perry, and P. C. Osenton. 2008. Sediment ingestion rates in waterfowl (Anatidae) and their use in environmental risk assessment. *Integrated Environmental Assessment and Management* 4:246–251.
- Badzinski, S.S., R.J. Cannings, T.E. Armenta, J. Komaromi and P.J.A. Davidson. 2008. Monitoring coastal bird populations in BC: the first five years of the Coastal Waterbird Survey (1999–2004). *British Columbia Birds* 17:1–35.
- Conder, J. M.M. T. Sorensen, P. Leitman, L. B. Martello, and R. J. Wenning. 2008. Avian ecological risk potential in an urbanized estuary: Lower Hackensack River, New Jersey, U.S.A. *Science of the Total Environment* 407:1035–1047.
- Devink, J.-M., R. G. Clark, S. M. Slattery, and T. M. Scheuhammer. 2008. Effects of dietary selenium on reproduction and body mass of captive lesser scaup. *Environmental Toxicology and Chemistry* 27:471–477.
- Devink, J.-M., R. G. Clark, S. M. Slattery, and M. Wayland. 2008. Is selenium affecting body condition and reproduction in boreal breeding scaup, scoters, and ring-necked ducks? *Environmental Pollution* 152:116–22.
- Devink, J.-M., R. G. Clark, S. M. Slattery, and D. Trauger. 2008. Are late-spring boreal lesser scaup (*Aythya affinis*) in poor body condition? *Auk* 125:291–298.

- Gorman, K. B., D. Esler, P. L. Flint, and T. D. Williams. 2008. Nutrient reserve dynamics during egg production by female greater scaup (*Aythya marila*): relationships with timing of reproduction. *Auk* 125:384–394.
- Heinz, G. H., D. J. Hoffman, J. D. Klimstra, K. R. Stebbins, S. L. Kondrad, and C. A. Erwin. 2009. Species differences in the sensitivity of avian embryos to methylmercury. *Archives of Environmental Contaminants and Toxicology* DOI 10.1007/s00244-008-9160-3.
- Latour, P. B., J. Leger, J.E. Hines, M.L. Mallory, D.L. Mulders, H.G. Gilchrist, P.A. Smith and D.L. Dickson. 2008. Key migratory bird terrestrial habitat sites in the Northwest Territories and Nunavut. *Canadian Wildlife Service Occasional Paper 114*. Environment Canada, Ottawa, Canada.
- Martell, A. M. 2008. Trends in bird populations in the Comox Valley, British Columbia, Canada, from 1976 to 2006. *British Columbia Birds* 18:2–14.
- Pollock, B., and K. L. Machin. 2008. Corticosterone in relation to tissue cadmium, mercury and selenium concentrations and social status of male lesser scaup (*Aythya affinis*). *Ecotoxicology* DOI 10:1007/s10646-008-0250-9.
- Pollock, B., and K. L. Machin. 2008. Effects of cadmium, mercury, and selenium on reproductive indices in male lesser scaup (*Aythya affinis*) in the western boreal forest. *Archives Environmental Contaminants and Toxicology* 54:730–739.
- Strand, K. A., S. R. Chipps, S. N. Kahara, K. F. Higgins, and S. Vaa. 2008. Patterns of prey use by lesser scaup *Aythya affinis* (Aves) and diet overlap with fishes during spring migration. *Hydrobiologia* 598:389–398.



Lesser Scaup

photo: Ray Murdy

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For a complete bibliography of lesser scaup:

<http://www.npwr.usgs.gov/resource/literatr/scaupbib/index.htm>