# BioLink

**The Official Newsletter of the Atlantic Society of Fish and Wildlife Biologists**

**VOLUME 55, ISSUE 1** **Spring 2018**

## A Review of the 2017 ASFWB Annual General Meeting in Moncton

The 54th Annual General Meeting of the ASFWB took place in Moncton, New Brunswick on October 25 - 26, 2017 and was well attended by a mix of new and familiar faces. Thanks to VP Program Christa Dubreuil from Wood in Moncton, NB for tackling the task. Christa was supported by her co-workers Bruce Moore and Beth Cameron.


*Above* Winners of the student awards, Kelly McLean, Douglas Munn, & Delaney Brooks, all from UNB.
Photo: Aaron McDevitt / UNB Forestry & Environmental Management Blog

We were pleased to have a wide variety of talks and posters from industry professionals, academics, government employees, and students from across Atlantic Canada. Kara Gerrow from Memorial University opened the conference presenting an analysis of how parental Common Murres have responded to changes in forage fish (capelin) availability and conditions since 2014. George Williams, from University of New Brunswick, discussed the feasibility of reintroducing Gray and Eastern Wolf to the Cape Breton Highlands as a means of controlling Moose density, and demonstrated modelling results that suggested reintroduction would likely not succeed in reducing Moose density to the desired levels. Wildlife biologist Brad Toms, from the Mersey Tobeatic Research Institute in Kempt, Nova Scotia, updated the conference attendees on the monitoring efforts of Eastern Mountain Avens on Brier Island. Counts in 2017 have revealed severe declines of local populations, and ongoing hydrological restoration is hoped to assist with the recovery of the population. Paul MacDonald, a wildlife biologist with Canadian Wildlife Services, spoke about

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**Do you have a research project, wildlife topic, upcoming event, photo, story, or anything else that you would like to see included in BioLink? If so, email Danielle Quinn (danielle.quinn@mun.ca) or Holly Lightfoot (hollyllightfoot@gmail.com)! We are always looking for content ideas and photos from our membership!**

## 2017 AGM in Moncton (continued)

the importance of government coordination and cooperation in research and management. He discussed the shared responsibility of provincial, territorial, and Indigenous governments in community-based harvest monitoring of migratory birds in Northern Labrador, and the development of such a monitoring program which will provide local-level information to guide harvest recommendations. Glen Parsons of the Nova Scotia Department of Natural Resources introduced the recently released Field Guide to Forest Biodiversity Stewardship, which presents practical information on the responsible use and conservation of Nova Scotia's forests and the biodiversity that it supports. The AGM was wrapped up by Tim Robinson and Edmund Redfield, who joined us from Fort Folly Habitat Recovery (FFHR) to deliver a keynote presentation about fish passage monitoring and salmon conservation efforts in the Petitcodiac River System. The continued operation of a fish net trap in Salisbury, New Brunswick has allowed for monitoring and quantitative comparisons of several fish species utilizing the Petitcodiac River following the opening of the causeway gates in 2010. In cooperation with various partners including Parks Canada and the Atlantic Canada Fish Farmers Association, FFHR are actively involved in the first marine cage site dedicated to salmon conservation in the world, in Grand Manan, NB, which houses smolts taken from the Petitcodiac River and mature adults to be released to the Pollett River.

The University of New Brunswick swept the student awards this year, with graduate students Kelly McLean, Douglas Munn, and Delaney Brooks awarded first, second, and third place, respectively. Congratulations to all of you on your continued success and we look forward to seeing you at future ASFWB events. Finally, three new members of the ASFWB Executive Committee were welcomed at the Business Meeting (see page 3 for details).

We would like to thank everyone who attended and to all those who contributed to another year of fascinating presentations and posters. We would also like to thank our sponsors, Ducks Unlimited Canada, Stantec, Nova Scotia Power, and Wood, for their support. We look forward to seeing you all at our Spring Seminar on April 24, 2018 in Sackville, New Brunswick, where the topic of discussion will be Urban Environments.

**We hope to see you at our 55th meeting in Corner Brook, Newfoundland in October!**



The ASFWB Biolink is published twice a year. Articles and opinions do not necessarily reflect the views of the Society or its members.

**Thank you to all who have contributed!**

**Visit our website at:**
**www.asfwb.ca**

## New Members Welcomed to the ASFWB Executive Committee

Four new members have joined the ASFWB Executive Committee!

Three executive positions changed hands at the AGM; Steph Walsh concluded her term as President and has moved to the role of Past President. Rosie MacFarlane, a freshwater fisheries biologist with the PEI Department of Communities, Land and Environment's Forest, Fish and Wildlife Division has taken on the role of President, after being involved with ASFWB since 1989. Andy Smith, an aquatic biologist with the Department of National Defence at 5th Canadian Division Support Base Gagetown in Oromocto, New Brunswick has succeeded Garry Gregory as VP Membership and Bruce Moore, an aquatic biologist from Wood in Saint John, NB has taken the Secretary / Treasurer reins from Lee Millet. More recently, we have also had wildlife biologist Johnathan Sharpe from the Newfoundland Department of Fisheries and Land Resources come on board as our VP Program for next year's AGM. Thank you to Steph, Garry, and Lee for all of your hard work during your terms.

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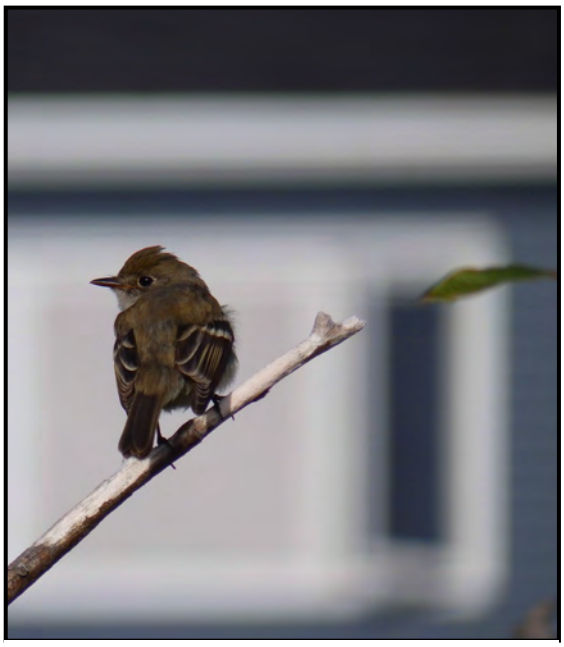
## Finding A Needle in the Syringe Box: Identifying Newfoundland and Labrador's First Willow Flycatcher

*By Lancy Cheng, Memorial University*

*Empidonax* is a genus of flycatchers which are renowned for the difficulty to identify their species. These small size insect eaters are very similar in plumage and some are best to distinguish by vocalizations. Fifteen species of *Empidonax* flycatchers had been recorded in Newfoundland and Labrador (NL), including yellow-bellied, alder, and least flycatchers.

An *Empidonax* flycatcher was sighted on 8 November 2017 in St. John's, NL, Canada, which was an obviously late record. Wing and tail morphology, and other plumage characteristics identified it as Traill's flycatcher, a supposed species now considered to be two distinct but closely related species, alder flycatcher and willow flycatcher. Bioacoustic analysis excluded the possibility of alder flycatcher, leaving only the possibility of it being a willow flycatcher (*Empidonax traillii*). This is the first record of willow flycatcher in the province of Newfoundland and Labrador, bringing its total bird species to 404. This is also the first and the only confirmed November record of this species in Canada!



*Above* A willow flycatcher, *Empidonax traillii,* in St. John's, NL
(Photo: Lancy Cheng)

## Science Atlantic Aquaculture and Fisheries and Biology Conference

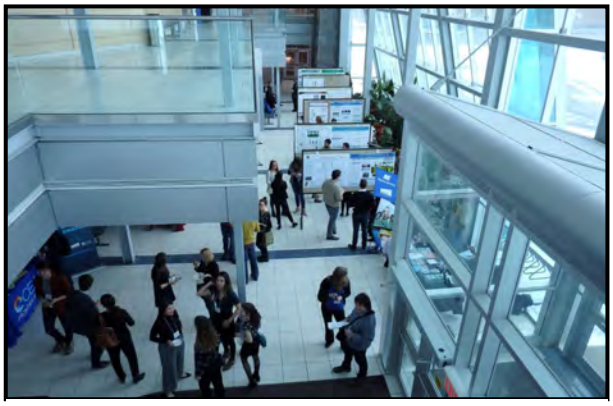


Photo: Science Atlantic

We are pleased to be able to once again feature two students who were recognized for their outstanding presentations at the 2018 Science Atlantic Aquaculture and Fisheries and Biology Conference, held at Memorial University from March 9-11.

This annual student conference brings together undergraduate and graduate students from across Atlantic Canada to share their research.

Quentin Kerr, Dalhousie University (page 6)
Allison Ford, Memorial University (page 14)

## *Nature in The News:*
## Ribbonsnake DNA Detective Work Used to Track Elusive Creatures

*By Cassie Williams*

*This article appeared on CBC News on April 21, 2018*

Photo: Wesley Pitts / CBC

A snake researcher is using DNA analysis to learn more about one of Nova Scotia's most elusive and threatened snakes. The eastern ribbonsnake is 70 centimetres long and in the same genus as the common garter snake. "They look very much like garter snakes to the uninitiated, but a dead giveaway is they have a crescent-shaped white scale right in front of their eye," said Steve Mockford, associate professor of biology at Acadia University and co-chair of the Ribbonsnake Recovery Team. "So if you're close enough to see their eye, you can tell if you have a ribbonsnake." The snakes are listed as Threatened under the federal Species at Risk Act and the Nova Scotia Endangered Species Act. Mockford said eastern ribbonsnakes received that designation after a 2002 study found little knowledge about the species. "Now, 16 years later, as we're looking at recovery actions, one of the big threats is still lack of knowledge," he said. "They're a very cryptic species. They blend well with their environment and it's actually difficult to gain information on them, including knowing where they are." His group is trying a new approach using environmental DNA extraction techniques to find the shy reptiles in their preferred habitats along the edges of rivers, lakes and bogs in the southwest interior of Nova Scotia. As a snake slithers through the world, it sloughs off cells. Researchers collect water samples, filter out debris, and look there for ribbonsnake cells. They can get DNA from that. "Provided you have a marker that's specific to the species, you can detect whether that species is within that environment," said Mockford. He said the predictable degradation of DNA due to temperature and UV exposure gives scientists a rough window of time in which the creature was in the area. In Canada the snakes only live

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## Ribbonsnake DNA Detective Work *(continued)*

*Above* The eastern ribbonsnake is found along the edges of rivers, lakes and bogs in the southwest interior of Nova Scotia (Photo: Jeff McNeil / CBC)

in the Great Lakes region of Ontario and southwestern Nova Scotia. Mockford said the snakes are harmless - but don't pick one up. "If you pick one up and aggravate them, they will have a sort of bite response but they have quite a small mouth and there's very little chance that they'll break the skin," Mockford told CBC's *Information Morning*. "Many people tend to be afraid of snakes and they're not comfortable with them."

Mockford said over the next few weeks, the snakes will be leaving their overwintering habitat in upland areas of Queens, Lunenburg, and Annapolis countries, plus the border of Annapolis and Digby counties.

**Have you seen an eastern ribbonsnake?**

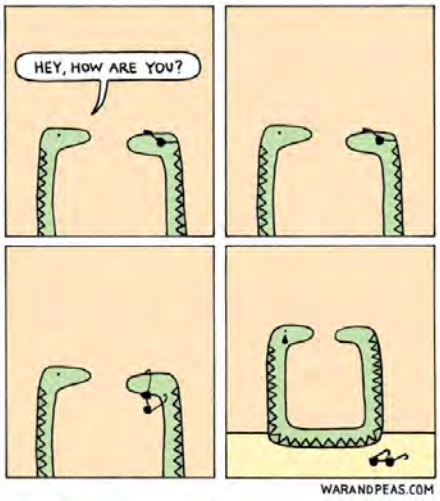
There are several ways to report your sighting:

[1]Contact the Mersey Tobeatic Research Institute

[2]Online at the Species at Risk Ribbonsnake Conservation Website

[3]On your Android phone with the World of Snakes app

[1]http://www.merseytobeatic.ca/projects-wetland-ribbon-snakes.php
[2]http://www.speciesatrisk.ca/ribbonsnake/index.php?q=node/23
[3]https://play.google.com/store/apps/details?id=com.megotechnologies.venomoussnakes




We are still raising funds for the **Gilbert R. Clements Scholarship**!

**If you would like to donate to the scholarship:**

**Online:** www.hollandcollege.com/alumni-and-friends/give-to-holland-college

**By mail:** 140 Weymouth Street
Charlottetown, PEI
C1A 4Z1

**By phone:** 902-566-9590

Cheques are payable to the Holland College Foundation.

Please include a note and/or indicate the award name in the cheque memo.

# Single Nucleotide Polymorphisms (SNP) Based Seasonal Spawning Discrimination in Atlantic Herring

*By Quentin Kerr, Dalhousie University*

About a year ago, I found myself with a block of frozen Atlantic herring and a question: when do these fish *get it on?* The herring (*Clupea harengus*) were from Bras d'Or Lake, an inland sea in Cape Breton. I had seen videos of herring schools and had heard the testimonials; they were, supposedly, magnificently abundant creatures. But on the lab bench they were very small, very dead, and very, very smelly. And, most importantly, they were non-descript; generally, a herring is a herring - at least in terms of appearance.

*Above* Atlantic herring (Photo: Quentin Kerr)

My question was (more or less) from my supervisors, Daniel Ruzzante and Angela Fuentes-Pardo. They had discovered over 6000 **S**ingle **N**ucleotide **P**olymorphisms (SNPs): sites in the DNA that differed between Atlantic herring that spawn in the spring, and those that spawn in the fall. These SNPs were consistent across the Atlantic Ocean, and many were linked to reproductive pathways; almost certainly, the timing of spawning in Atlantic herring is a matter of adaptation. Undoubtedly, we could say a lot about 6000 SNPs. But what about fewer - many fewer? Could I take a small subset of these differences (just 32 SNPs) and use them to answer questions about the spawning season of unstudied fish?

The first thing to establish was how these differences would change over time. Deep in one of the half-dozen chest freezers scattered around our lab was a clue: 176 herring samples from the Gulf of St. Lawrence, both fall and spring spawning, from 2005 and 2014. Next, I needed to demonstrate the applicability of this SNP-based seasonal-spawning discrimination. To address this, I had my frozen, stinking brick of herring, all the way from Cape Breton. Bras d'Or Lake herring were always thought to be spring-spawning, and fished in early April for lobster bait. But by the late 1990's, this stock was in trouble, with reduced spawning and higher effort per catch, and in 1999 the fishery was closed. When the herring fishery left the lake, so did the researchers. Now we know herring remain in the lake, but we don't know when they spawn.

I cut 276 small cubes of muscle tissue from these herring, digested them to get semi-clear vials of liquid, and after two months of work, ended up with different semi-clear vials of liquid. If these fish were non-descript before, surely they were indistinguishable now. These vials were dropped into the mail, and a month later, the results arrived - all 276 fish, reduced to seemingly nonsensical combinations of four letters: A, T, C, G.

What did I find? Like my supervisors' results, the spring component and the fall component were reliably distinct in the Gulf of St. Lawrence. Every SNP was significant; I could visualize all 32 on a single dimension and only lose about 10% of the variation. Remarkably, not one of these loci appeared to change between 2005 and 2014. This method of spawning-season discrimination worked on herring from 13 years ago, from 4 years ago, and almost certainly, it would work now.

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## Seasonal Spawning Discrimination in Atlantic Herring *(continued)*

Fantastic! I compared the Bras d'Or Lake herring (at these SNPs) with the fall- and spring-spawning components from the Gulf of St. Lawrence. My original question was *when do these fish get it on*? The answer I found in the DNA, at least, was curiously inconsistent with the historical records that classified them as spring spawners. While some fish were spring spawners, the majority actually spawned in the fall. This isn't a change in behavior, but the emergence of a genetically-distinct subpopulation. Did they migrate in from the Scotian Shelf? Or have they always been there, undetected?

You may be wondering, *does it really matter when these herring spawn*? In Bras d'Or Lake at least, it appears the fall component thrived while the spring-spawners declined. Could this switch have mitigated ecosystem effects? It's possible. Certainly, these differences mean herring - and the people who fish them - can avoid putting all their eggs in one basket (or rather, one season). Undoubtedly, what I found was just a glimpse of the way these spawning components respond to exploitation - and perhaps

*Congratulations to Quentin, who won 1st Place Undergraduate Oral Presentation and Best Overall Oral Presentation at the 2018 Science Atlantic Fisheries and Aquaculture Conference for his talk "Temporal stability of genomic differences between spawning season components in Atlantic herring".*

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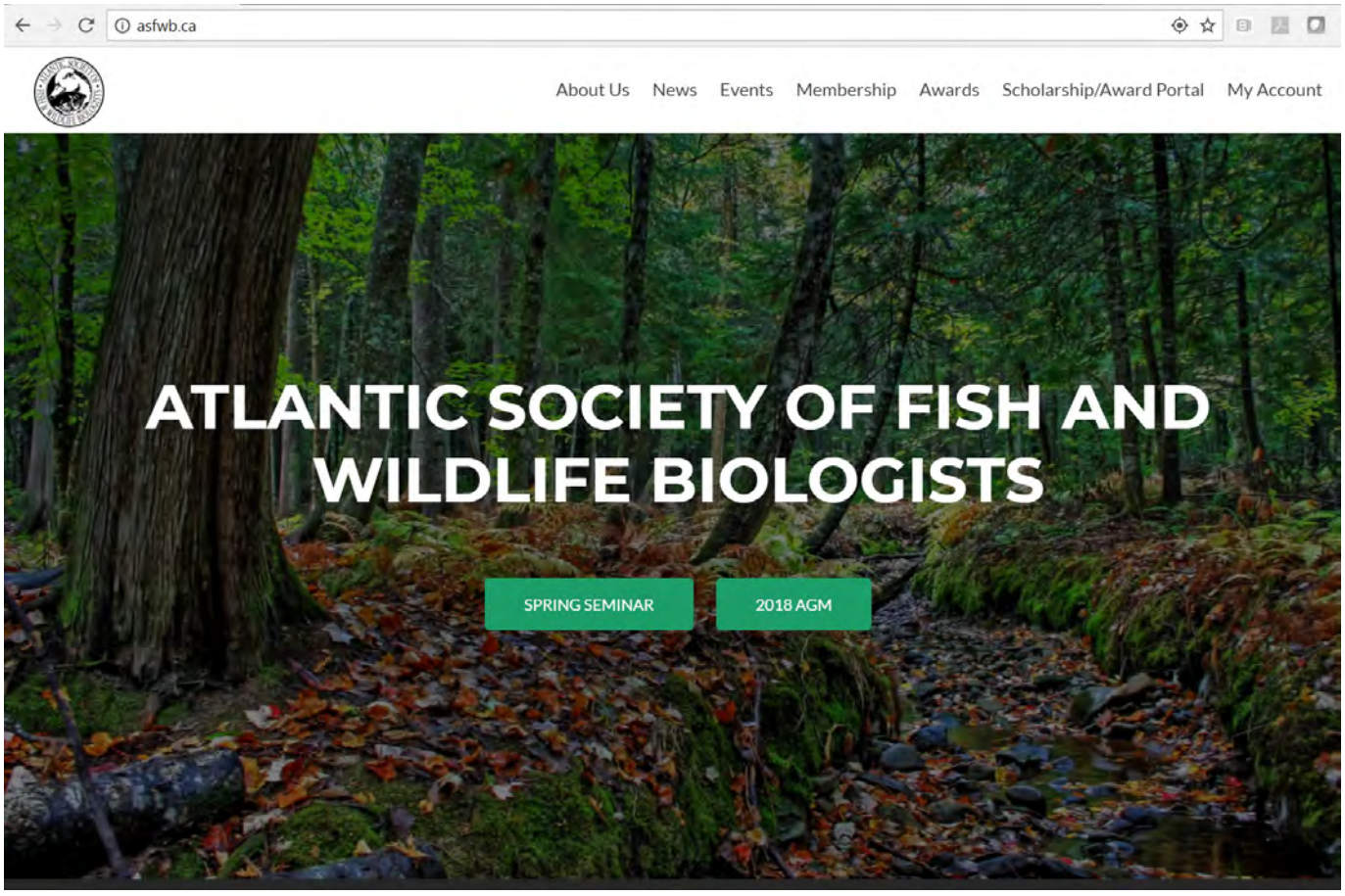
**Don't forget to visit our new and improved website** www.asfwb.ca where you can register for upcoming events, download newsletters, find blog posts from scholarship winners, apply for or renew your membership, and more!



# Recent Literature

## Heading to the field and need some reading material? Keep up to date with fish and wildlife research publications from Atlantic Canada and beyond.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# All Bite But No Bark: Roseroot Beetles Found Infesting Roseroot Plants in Newfoundland

*Above* A male roseroot plant. Roseroot are dioecious, with male and female flowers on separate plants.
(Photo: Allison Ford)

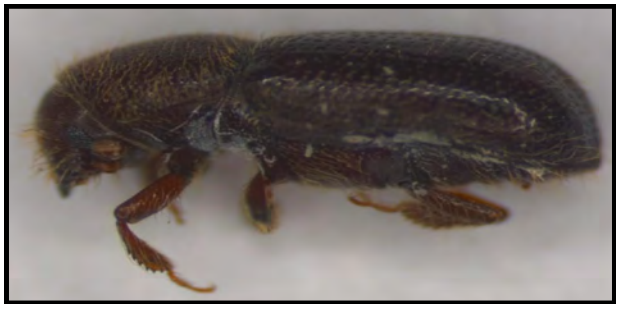
*By Allison Ford, Memorial University*

We have an amazing plant here on the Eastern Coast of Canada. Scientifically, it is known as *Rhodiola rosea*. Its gnarled, bulky rhizomes might not look like much, but they hold many surprises. If you cut them open, they smell like roses - hence the common name for this plant, "roseroot". Even better, this plant shows promise in treating conditions such as stress, fatigue, and even depression. It is also a culturally important food and medicine used by northern Indigenous peoples around the world.

In 2001 a new species of bark beetle, *Dryocoetes krivolutzkajae*, or "roseroot beetle", was discovered living in the rhizomes of roseroot plants in Russia. In 2012 the same species was discovered in roseroot rhizomes in Nunatsiavut, Labrador, and New Brunswick. This species is unique in several ways. Most bark beetles attack conifers and have even been known to kill large swaths of forest, such as the famous mountain pine beetle outbreaks, but very few bark beetles attack herbaceous plants such as roseroot, and none live on northern treeless landscapes like the roseroot beetle does. Like other aggressive bark beetles, this species form galleries within plant tissues, causing the tissue to decay.

After spending June and July of 2017 digging roseroot plants out of cliffs, shorelines, and other habitats in Newfoundland, I was able to document another new record for *D. krivolutzkajae* and made several interesting discoveries. First, I found that not only is the roseroot beetle present across the entire island of Newfoundland, but that it was present at 76% of the 17 samples sites, and in 44% of the 164 roseroot plants sampled. I also found that plants with more biomass were more likely to be infested with roseroot beetles. This may be because the larger plants are typically older and have had more time to become infested. Additionally. roseroot plants growing in gravel next to roadsides were less likely to be infested. It is though that roadside gravel may be unsuitable for bark beetle infestations, potentially due to soil drainage or anthropogenic pollution. Sites geographically closer to one another had higher degrees of bark beetle infestation. This makes sense, because bark beetles typically infest nearby plants when they disperse. Finally, I found larvae, pupae, and adult roseroot beetles present in roseroot galleries shortly after snowmelt. It appears that these beetles overwinter in all three stages and live for two to three years in the rhizomes of the plants.

*Continued on page 15*



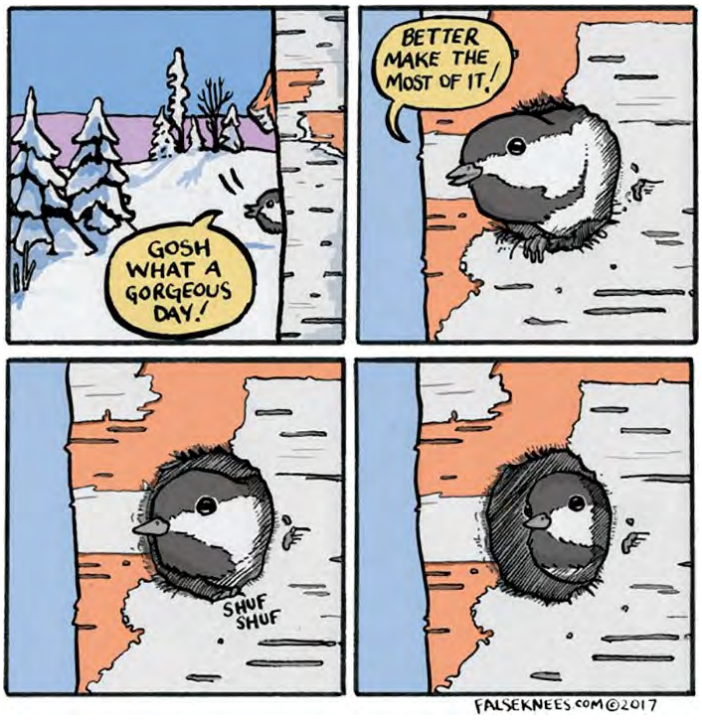
*Above* Roseroot beetle, *Dryocoetes krivolutzkajae*, found in the rhizomes of roseroot plants in Newfoundland.

*Below* Decayed tissue and roseroot beetle galleries in a Newfoundland roseroot rhizome.
(Photos: Allison Ford)

## All Bite But No Bark *(continued)*

The wonderful thing about this research is that there is so much we don't know about this species! For example, it is not clear how this species will affect the long-term survival of roseroot plants. This is important because roseroot is endangered in some parts of its range due to overharvesting, and may also be affected by climate change in the future. Roseroot is also a valuable cultivated crop, and these beetles could potentially be a pest of cultivated roseroot in the province. This study has not only documented a new record of a species on the island, but will potentially benefit the conservation of a culturally and economically important plant species.

*Congratulations to Allison, who won the Botany Award sponsored by the Canadian Botanical Association at the 2018 Science Atlantic Biology Conference for her talk "The ecology and effects of the bark beetle species, Dryocoetes krivolutzkajae, on roseroot populations in Newfoundland, Canada".*

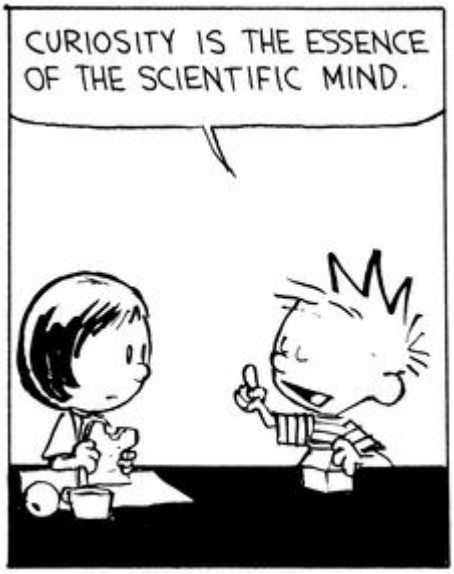

### This issue of BioLink can help you brush up on your local biology trivia!

1. What year did the Bras D'Or Lake herring fishery close?
2. How wide is the Chignecto Isthmus at its narrowest point?
3. In what country was the roseroot beetle first discovered?
4. Where is the first marine cage site in the world dedicated to salmon conservation located?
5. How many species of birds can be found in Newfoundland and Labrador?

Answers throughout, or on page 21!

## Skype A Scientist Program Brings Scientists to the Classroom

Skype a Scientist gives you the opportunity to connect with students around the world without having to leave your lab or office! Founded by graduate student Sarah McAnulty at the University of Connecticut, this science communication program matches scientists with classrooms around the world for 30-60 minute skype sessions. These sessions can be focused on a particular area of expertise, or a discussion of what it's like to be a scientist. The program aims to give students in K-12 the opportunity to get to know a "real scientist" and provide teachers with the resources needed to showcase the diversity of science and scientists around the world.




If you are a scientist interested in volunteering a little of your time, or a teacher looking to connect, go to **www.skypeascientist.com**

## *Management in the Media:*

### Most Wildlife Management in Canada and US Lacks Fundamental Science, Study Finds

*By Alex Ballingal*

*This article appeared in The Star on March 7, 2018*

Photo: Ontario Ministry of Natural Resources / The Star

A new study of more than 650 wildlife management systems in Canada and the United States concluded that most of them lack "fundamental hallmarks of science," a finding that the study's lead author said raises doubts about hunting regulations and animal protection in North America. Using a framework of 11 criteria to determine scientific rigour, biologist Kyle Artelle and his co-authors found only 26 per cent of the wildlife management systems include benchmarks to measure performance, while almost half - 48 per cent - do not publish information about the size of animal populations or how they are changing over time. The study also found that just 11 per cent of the systems publicly report how hunting quotas are set, while only 9 per cent of the systems are subject to "any form" of independent review, something the authors say "deviates substantially" from proper scientific practice. Artelle, a biologist with the Raincoast Conservation Foundation and post-doctoral fellow at the University of Victoria, said the findings mean it is difficult to assess how governments choose to manage animal populations that are hunted in Canada and the U.S. "This could be cause for alarm if some of this hunt management is not as rigorous as some might hope," he said in an interview this week.

*Continued on page 17*

## Wildlife Management *(continued)*

"It can be concerning on a couple of levels. Science is a really great tool… In the absence of it, it's hard to say how credible management is." The study was published Wednesday in the journal, *Science Advances*. Artelle and his five co-authors examined 667 systems to manage animal populations that are hunted in 62 jurisdictions at the provincial, territorial and state levels in Canada and the U.S. The systems covered 27 species, which Artelle said include big game animals like deer, elk and sheep, smaller mammals killed for their fur, and birds such as quail and pheasants. He said the study included 123 wildlife management systems in all provinces and territories except Quebec, because plans were not available in English. Artelle explained that their goal was to assess the scientific basis of management systems using 11 criteria under four broad hallmarks: measurable objectives, the use of evidence, public transparency and independent review. Sixty per cent of systems examined in the study fulfilled just one or two of those hallmarks. While Artelle said that decisions around wildlife management shouldn't be solely based on science - social and economic considerations are important too, he said - he argued that it should be emphasized when the public expects it, or when governments justify policies by appealing to "evidence-based" decisions. "Agencies will often defend a particular policy using the words 'science-based,'" Artelle said. "It has a lot of weight to it, but if it turns out that this isn't as science-based as it's being sold, then I think that's just concerning in terms of good governance, in terms of having honest discussions with the public." The population of terrestrial species in Canada dropped by an average of 10 per cent between 1970 and 2014, mainly due to a decline in mammal population, according to the species index published last month by Environment and Climate Change Canada.

## Good News for Earth Day!

*This news article was released by Nature Conservancy Canada on April 20, 2018 in Moncton, NB*

To help celebrate Earth Day, April 22, the Nature Conservancy of Canada (NCC) is announcing the protection of 131.5 hectares (325 acres) of forest and salt marsh in southeast New Brunswick. It's part of the group's ongoing project to conserve wilderness habitat for a vital Maritime wildlife corridor. The not-for-profit organization has acquired 79.5 hectares (197 acres) of wetlands and forest in Halls Hill, near Sackville, an important addition to NCC's existing conservation areas on the Chignecto Isthmus, the narrow stretch of land between New Brunswick and Nova Scotia. Approximately 25 kilometres across at its narrowest point, the Chignecto Isthmus provides the only land connection between wildlife populations in Nova Scotia to those in the rest of North America. NCC has so far conserved 1,385 hectares (more than 3,400 acres) on the Chignecto Isthmus on both sides of the Nova Scotia/New Brunswick border, helping to link existing protected areas and to secure a permanent wildlife corridor. The Halls Hill conservation area contains a mix of mature and regenerating forest, and borders other land protected by NCC. The new NCC land is located between the federally protected Tintamarre National Wildlife Area in New Brunswick and the provincially protected Chignecto Isthmus Wilderness Area in Nova Scotia. Protecting mature forest habitat here is critically important for the health, movement and renewal of wildlife populations, especially the endangered mainland moose of Nova Scotia. If this narrow strip of wilderness is not conserved, over time, Nova Scotia would become an "ecological island" as far as wildlife is concerned. Along with the Halls Hill property, NCC has purchased a coastal property in nearby Shemogue, which provides habitat for many species of shorebirds and migratory birds. The 52-hectare (128-acre) property at Comeau Point features 1.5 kilometres of shoreline, including an intact and provincially significant salt marsh, a type of wildlife habitat which is becoming increasingly rare on the Northumberland Strait. Willet and Nelson's sharp-tailed sparrow have been identified on the property, two birds whose populations are in decline. Conservation of these two properties was made possible through funding from the Government of Canada's Natural Areas Conservation Program, a program established to accelerate the conservation of privately owned land in Canada. This project also includes a partial land donation made through the Government of Canada's Ecological Gifts Program, which provides enhanced tax incentives for individuals or corporations donating ecologically significant land. The Open Space Institute, U.S. Fish and Wildlife Service, Crabtree Foundation, McCain Foundation and many private donors also supported these conservation projects.

# Spring is in the air... BECOME A MEMBER TODAY!

## The Atlantic Society of Fish and Wildlife Biologists

Regular Membership: $20/year

Student Membership: $5/year

Use PayPal and become a member or renew your membership online at

**www.asfwb.ca**

or contact the Society's Treasurer, Bruce Moore (bruce.moore@woodplc.com) for other payment options!

- Network of professional contacts, including biologists, professors, managers and researchers from across Atlantic Canada
- Bi-annual newsletter keeps you up to date on local research and upcoming events

**Don't forget to check us out on Facebook!**

facebook

Name:
Atlantic Society of Fish and Wildlife Biologists (ASFWB)

Biology Department

ACADIA UNIVERSITY

Dear Sir or Madam,

I would like to thank you for your financial support in the form of the Atlantic Society of Fish and Wildlife Biologists Donald G. Dodds Scholarship. It is helping me to further my education + follow my passion.

I grew up on a lake in Northern Ontario + have always been fascinated by the water. Following this fascination led me to Dalhousie University to pursue a Bachelor's degree in Marine Biology, where I discovered what all the ocean had to offer, along with my love for Atlantic Canada. Upon graduation, I knew there was so much more for me to find out + I wasn't done with Nova Scotia just yet! So now, here I am at Acadia University working on my Master's degree.

I am supervised by Dr. Stokesbury + am a part of the coastal ecology lab. I am studying the population dynamics of sea cucumbers in a fishery off Nova Scotia. My time here so far has been filled with new + exciting experiences that are making me a better + more confident scientist with each passing day.

Studying a fishery has really opened my eyes to a whole new area of complex + intriguing problems that encompass not only the biology that I am so comfortable with, but also the socio-economic factors that push me out of my comfort zone.

To me, this scholarship has helped finance one of the most profound journey's of self-discovery I have yet to embark on and for that I am grateful. Thank you, Danni Harper

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# Upcoming Events

family-friendly!

**11-13 May:** 7th Annual Nova Scotia Hiking Summit. Ingonish, NS

**12 May:** Sipekne'katik First Nations Striped Bass Derby. Stewiacke, NS

**13-16 May:** World Conference on Marine Biodiversity. Ottawa, ON

**24-26 May:** Atlantic Canada Coastal & Estuarine Science Society Conference. St. John's, NL

**1-3 June:** Festival of Nature. Bathurst, NB

**18-21 July:** Canadian Society for Ecology and Evolution Meeting. Guelph, ON

**21-26 July:** North American Congress for Conservation Biology. Toronto, ON

**11-12 August:** BioBlitz. Cape Breton Highlands National Park, Ingonish, NS

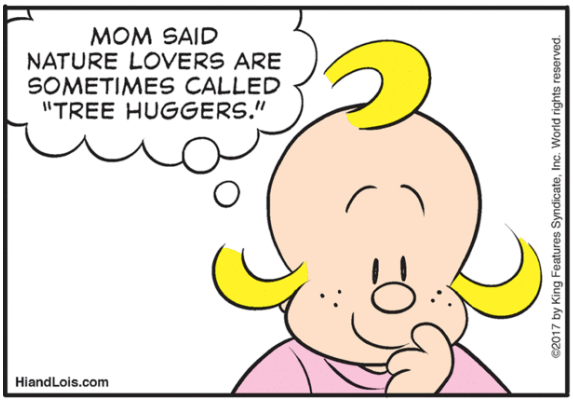
**19-26 August:** International Ornithological Congress. Vancouver, BC

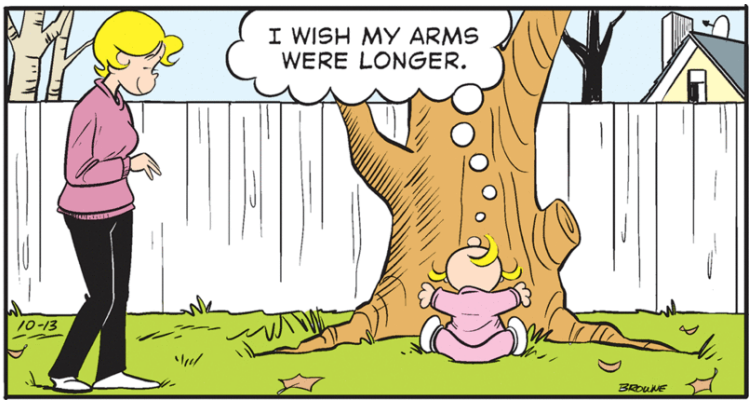
**22-23 September:** Sustainable Oceans Conference. Dalhousie University, Halifax, NS

**October (date TBA):** ASFWB 55th Annual General Meeting. Corner Brook, NL

**11-14 November:** Entomology 2018. Vancouver, BC

Every year, Ducks Unlimited Canada holds hundreds of fundraising events that are open to the public, and encourage everyone to attend. For more information, go to **www.ducks.ca/events**




## ASFWB Fish and Wildlife Research Grant

The **ASFWB Fish and Wildlife Research Grant** was established in the fall of 1994 to assist members who are conducting or supervising wildlife or fisheries research in Atlantic Canada. The grant provides funding up to $500 annually for research projects. Any aspect of fish and wildlife research will be considered, but projects with applied management goals will receive preference. Applicants must be members of ASFWB. Projects that are largely government sponsored or funded are not eligible for this award. For more information, go to:
**http://www.chebucto.ns.ca/environment/ASFWB/researchgrant.html**

**Answers:** (1) 1999, page 6 (2) 25 km, page 18 (3) Russia, page 14 (4) Grand Manan, NB, page 2 (5) 404, page 3