



Part 2 of Norman Brandford's Salamander research in Southeast Alaska.



Join us for the 2nd Annual Byer's Lake Cabin retreat.



AHS partners with Sand Lake Elementary to install frog call monitors in Sand Lake Park.

ALASKA HERPETOLOGICAL SOCIETY



NORTHERN HERP CHRONICALS

6TH EDITION
APRIL 2017



WOOD FROG
Lithobates sylvaticus

**A.H.S. SHIRTS
ARE HERE!**

MORE INFORMATION ON PAGE 8



SAVE THE DATES



APRIL

Joint Meeting of the Alaska Herpetological Society and the Alaska Chapter of The Wildlife Society- April 6, 2017; Fairbanks, AK

AHS Cabin Retreat- April 21-23, 2017; Byer's Lake in Denali State Park, AK

Creamer's Field Spring Migration Celebration- April 29, 2017, Noon-4PM; Fairbanks, AK

Save the Frogs Day- April 29, 2017

MAY

Creamer's Field Mother's Day Frog Walk- May 14th, 2017; Fairbanks, AK

JULY

Joint Meeting of Ichthyologists and Herpetologists- July 12-16; Austin, TX

40th Annual Symposium International Herpetological Society - July 19-22; Rodeo, NM

SEPTEMBER

National Chapter of The Wildlife Society- September 23-27, 2017; Albuquerque, NM



FOR MORE HERP RELATED EVENTS FOLLOW US ON FACEBOOK

FROM THE PRESIDENT

Greetings Fellow Herpers!

This year looks to be a great year for herping in Alaska. Although it's cold right now, soon Alaska will be a buzz

with the calls of wood frogs. With the New Year comes plenty of opportunities to participate in AHS events. The main draw of this year will be our bi-annual meeting held April 6 in Fairbanks. We are holding our meeting in conjunction the Alaska Chapter of The Wildlife Society. We will also have a spring herping trip to Denali State Park. We have reserved a cabin at Byers Lake for April 21-23. All are welcome to come and look for mating wood frogs.

Mark Spangler is again doing FrogWatch in Fairbanks and looking for participants. FrogWatch is a great activity for the whole family and a great way to get involved in some citizen science.

So here's to another great year for Alaskan Herps and AHS!

Don Larson
djl Larson@alaska.edu



SECRETARY'S CORNER

AHS has been in winter dormancy for too long, but now we're ready to share some of our stories with you. Within these pages, you'll read about research efforts, citizen science projects, and educational lessons from herp enthusiasts across the state. We

hope you find this revamped newsletter coincides with an overall re-imaging of the Alaska Herpetological Society. In addition to our usual spring events, we look forward to bringing you an excellent conference and field trip opportunity in April.

As secretary, it is my responsibility to ensure that you see the value in your membership. So much of what we do easily goes unnoticed. This newsletter is meant to help highlight what your support allows us to do. In addition, every member is invited to contribute to the success of our organization in their own way! This can take the form of renewing your membership, writing a newsletter article, or volunteering at a local event. Of course, we also want to be there for you. If you organize an event, conduct research, or do anything that you think would be appropriate for AHS to sponsor, please get in contact with us and we will try our hardest to make it happen. If you are reading this, thank you sincerely for your continued support, and please consider renewing your membership in 2017!

Best wishes,
Mark Spangler
maspangler@alaska.edu

V.P. PERRY

Seth Perry has been very busy so far this year with commercial fishing and crabbing activities throughout the state. He was unable to prepare an article for this newsletter but asked that we relay his appreciation for being able to serve yet another year as your Vice President. We are grateful to have him on the Executive Board and we thank him for years of service to this organization and to the field of herpetology in Alaska.



Fellow Herpers,

So awesome that we are bringing back the Northern Herp Chronicles!

The newsletter has been out of print for a couple of years now but was a huge hit in former years. It's a wonderful way of helping our members to keep in touch and to stay on top of all things herpetofauna in Alaska. I fully support these efforts and hope that each of you will consider contributing to this effort by submitting photos, articles, upcoming events, factoids, and whatever else you want to share!

Even though the newsletter has been out of print, AHS has not been stagnant. The organization has been evolving with new leadership, new programs, and new visions for the future. We have continued to support our Stikine Long-term Amphibian Monitoring Program (SLAMP), education and outreach programs, and scientific research and dissemination. AHS is becoming more widely known and recognized in Alaska as THE predominant herpetological organization of the North.

Despite our successes, AHS remains challenged with two of its long-standing hurdles – minimal active membership and an extremely limited treasury. As always we have made the best of the resources at our disposal, but we now ask everyone to step up to the plate to support this organization. Please consider volunteering on our behalf at local events, writing articles for our newsletter, helping to organize our conferences, purchasing t-shirts, or making donations large and small. Every hour of your time or dollar from your wallet is critical to ensuring the continued viability of our program. Please do not hesitate to contact an officer to find out more about where your contributions are most needed.

Looking forward I expect that AHS will be doing great things in the near future. It is exciting that we are partnering with the Alaska Chapter of The Wildlife Society to hold a spring conference, that we are planning to continue our collaboration with the students of Petersburg High School / Wrangell Girl Scouts to conduct SLAMP research, and that our next round of herp t-shirts are available for pre-order! Our officers are also planning another summer social retreat and we are hoping for awesome turn-out so that we can get to know each and every one of you.

As spring approaches I ask that you keep your eyes open for amphibian emergence around the state. Please be sure to share your observations with us via the website, facebook page, or officer emails. Keep on herpin!

Joshua T. Ream, PhD
akFrogDr@gmail.com

2 CENTS FROM THE TREASURER



Written by Joshua Ream, PhD

Member Dustin Hattenburg and I travelled to the Big Island of Hawaii in early December 2016 and we made a point to engage in some informal herpetological inquiry. It was relatively

easy to find day geckos and green sea turtles

among other vibrant charismatic species on the island. Of particular interest on this trip however was **the nightly chorus of Coqui frogs**, especially on the eastern half of the island. While we were somewhat familiar with the introduction of this species to

Hawaii, the Dominican Republic, Virgin Islands, and Florida from their native Puerto Rico, never before had we experienced the surreal auditory magnitude of their harmonious call.

There is no doubt that populations of these frogs can be quite loud, but the perception of this sound as calming, brain rattling or neutral seems to vary among humans that are exposed to this sound. We were surprised that a local hotel in Hilo actually provided guests with information on the species and with ear

plugs for those that are bothered by the noise. It is easy to imagine that these choruses could be considered detrimental noise pollution for other species that have not evolved to communicate in the presence of Coqui Frogs!



With that, I just wanted to provide a couple of interesting facts regarding the populations. Coquis were first introduced to Hawaii around 1988. In their native Puerto Rico they are typically found in densities of approximately 40 mature adults per 20x20m plot of habitat but on the Big Island they are often found in densities of >200 in the same area. This is presumably because of a lack of predators in Hawaii, particularly owls, snakes, tarantulas and scorpions. Some resource managers are fearful that they will provide an ample food source for brown tree snakes if they ever make their way to the island!

If any of our members are ever in Hawaii, I encourage you to look around for Coquis and to think about the impact introductions have on other species. Experience their call with appreciation, try not to pull out your hair, and consider the impact of introductions on humans and other species alike.



YOU'RE INVITED!



JOINT MEETING OF ALASKA CHAPTER OF THE WILDLIFE SOCIETY AND THE ALASKA HERPETOLOGICAL SOCIETY

Please join us for the 3rd bi-annual Alaska Herpetological Society conference! This year we are partnering with the Alaska chapter of The Wildlife Society for a joint meeting. The conference will be held on April 4-6, 2017, 8am-noon at the Wood Center of the University of Alaska Fairbanks campus. Video and teleconference attendees are welcome.

THURSDAY MORNING, April 6th
SESSION C - Alaska Herps and Other Non-Game Species
Moderator - Mark Spangler

- 8:00 Welcome and Opening Remarks - S. Brainerd and M. Spangler
- 8:10 H. Kristenson & A. Larsen - Monitoring wood frog phenology in Interior Alaska parklands
- 8:30 T. Simmons - An introduction to the Siberian salamander (*Salamandrella keyserlingii*) and why it should be in Alaska
- 8:50 D. Larson - Parasite survival in frozen wood frogs
- 9:10 F. Huettmann & S. Sriram - 104 public environmental GIS habitat layers on a 60m-2km pixel resolution to explain frog and species distributions in Alaska and beyond: Use, interpretation and a debate towards a governance standard
- 9:30 M. Spangler, J A. Lopez & F. Huettmann - A reassessment of wood frog (*Rana sylvatica*) distribution in Alaska using environmental DNA monitoring

AHS BUSINESS MEETING

WHERE: Wood Center Fairbanks
WHEN: 12noon to 1pm

CALL IN NUMBER: 1-605-475-4129

CALL IN PIN: 785 6464

MORE INFO: akherpsociety.org

FOR SESSION ABSTRACTS SEE NEXT PAGE -->

Full meeting registration (includes TWS events on April 4 & 5) can be found at:
http://twسالaskameeting.com/2017_meeting/meeting_registration/

AHS-only participants can register online:
AKHerpSociety.org/conferenceregistration.htm

SEE YOU IN APRIL!

TWS/AHS SESSION C ABSTRACTS

104 public environmental GIS habitat layers on a 60m-2km pixel resolution to explain frog and species distributions in Alaska and beyond: Use, interpretation and a debate towards a governance standard

Falk Huettmann, Institutue of Arctic Biology UAF

Sumithra Sriram, College of Computing, Georgia Institute of Technology, Atlanta Georgia

Abstract: Habitat associations make for the bread and butter in science-based wildlife management. Research techniques like Habitat Suitability Indices (HSIs), Resource Selection Functions (RSFs), Species Distribution Models (SDMs), Species Abundance Models (SAMs) and spatial Population Viability Analysis (sPVA) all require those layers, for instance. However, nobody has ever made use of, and associated inference from, all the 104+ freely available layers now being available for such work in synergy. Our conservation management policy is still not requiring to employ such data, rather vice versa (parsimony is still pursued in governance of wildlife). Based on Sriram and Huettmann (in review; <http://www.earth-syst-sci-data-discuss.net/essd-2016-65/>) here we show an example using frogs in Alaska, and what the advantage is to use such a vast, complete set of environmental layers in order to describe and predict species distributions in a data mining framework. Based on various and latest research we show what the cost-benefit is for using such an approach and for OneHealth initiatives focusing on issues way beyond "just" frogs and wildlife: human health and sustainable wildlife and earth management! We will conclude with a discussion on certainty, and how to use and to proceed next, now that we have such data and tools readily available at our fingertips online for all citizens anywhere.

Monitoring wood frog phenology in Interior Alaska parklands

Heidi Kristenson, National Park Service

Amy Larsen, National Park Service

Abstract: Wood frogs (*Rana sylvatica*) are an important part of the aquatic food chain in Interior Alaska. Due to their unique overwintering strategy, they are very sensitive to changes in environmental conditions, particularly those that affect spring phenology. The Central Alaska Network (CAKN) Inventory and Monitoring Program of the National Park Service (NPS) began monitoring wood frogs in 2011 as part of the Alaska Shallow Lake Monitoring Program, which studies long-term trends in physical and biological characteristics of lakes in parklands across Alaska.

Acoustic recorders are deployed annually at sites throughout the Interior, and the recordings are used to determine the timing and duration of the wood frog breeding season. In addition to frog call data, we collect measurements of temperature and water level, which are factors thought to influence wood frog breeding behavior.

Our results show that the timing and duration of the wood frog breeding season was variable from year to year and from site to site, depending on the local environmental conditions impacting thaw. The relationship between air temperature and the onset of calling displayed patterns that differed from site to site, but once environmental conditions allowed for calling to commence, the frogs chorused fairly consistently at all sites regardless of subsequent fluctuations in temperature.

Parasite survival in frozen wood frogs

Don Larson, UAF AHS

Abstract: I examined whether larval cysts of the trematode *Ribeiroia ondatrae* can survive within freeze-tolerant wood frogs (*Lithobates sylvaticus*) and whether survival was dependent on host adaptations to freezing. I exposed 107 tadpoles from Interior Alaska to 30 *R. ondatrae* cercariae each. Parasites were considered alive at experiment end if motility was observed either within cysts or after excystment. After metamorphosis, unfrozen frogs (n=22)

were held for two weeks at 2°C. Frogs experiencing a single freeze (n=26) were cooled from 2°C to -6°C over 12 hours, nucleated with ice to initiate freezing at -1.5°C, and then held for two weeks at -6°C. Frogs experiencing an ecologically relevant repeated freeze-thaw (n=29) were cooled over 12 hours from 2°C to 6°C, nucleated at -1.5°C, and then warmed over 12 hours to 2°C; this cycle was repeated twice then frogs were held at -6°C for two weeks. Frogs (n=10 per group) averaged 18.7 ± 2.7 motile metacercariae prior to freezing. There were no changes in abundance among unfrozen frogs after 2 weeks. Freezing significantly decreased parasite survival. No parasites survived in the single freeze group; however, parasite survival was 23% in the freeze-thaw group. Parasite survival in this group showed a positive linear relationship with cryoprotectant concentrations in the frog host. These results reveal how ecologically relevant conditions are necessary to evaluate parasite survival. This research also demonstrates how host overwintering physiology can detrimentally affect parasite survival. Additionally, these results indicate parasites may use host cryoprotectants to survive freezing.

A reassessment of wood frog (*Rana sylvatica*) distribution in Alaska using environmental DNA monitoring

Mark Spangler, Institute of Arctic Biology UAF

J Andres Lopez, College of Fisheries and Ocean Sciences UAF

Falk Huettmann, Institute of Arctic Biology UAF

Abstract: The state of Alaska has designated the wood frog (*Rana sylvatica*) as a species of greatest conservation need, in part due to monitoring efforts that are very localized and not consistent. We aim to bring consistency to wood frog monitoring efforts in Alaska by providing a fast, inexpensive, and highly sensitive method of detection using environmental DNA (eDNA), a tool increasingly applied in conservation biology. We demonstrate the first implementation of eDNA monitoring for wood frogs in Alaska along the Dalton Highway corridor, which represents an under-sampled latitudinal gradient in northern Alaska. We collected water samples from 171 sites between Fairbanks and Deadhorse, Alaska. Total genomic DNA from these samples was filtered, isolated, and amplified using a custom, species specific qPCR assay. Samples were run in replicate (4x) and results were scored as the number of replicates that successfully amplified target DNA (0-4). Species distribution models were built and assessed using these data in combination with open-access wood frog occurrences and environmental and climate GIS layers for Alaska. eDNA surveys reveal trace amounts (qPCR score) of wood frog DNA in 47 wetland sites along the Dalton Highway corridor, including 14 sites north of the Brooks Range, where anecdotal reports comprise the only documented wood frog occurrence records. These results suggest that wood frogs are more widely distributed in northern Alaska than previously supposed or that DNA can travel in the environment further than previously documented.

An introduction to the Siberian salamander (*Salamandrella keyserlingii*) and why it should be in Alaska

Trey Simmons, National Park Service

Abstract: At first blush, it seems highly unlikely that salamanders of any kind could exist in interior Alaska, given the long, extremely cold winters that the region experiences. However, in terms of habitat associations and physiological tolerance, the most likely candidate is the Siberian salamander, *Salamandrella keyserlingii* (Hodges 1976). This species, one of the most widespread amphibians in the world, with a known range of over 12 million km², is found throughout northeast Asia from the Arctic Ocean to as far south as North Korea. It is unique among salamanders in being able to withstand freezing. Adults are able to survive temperatures as low as -40°C, and the animals remain active at temperatures near 0°C. The adults can survive for very long periods in the frozen state, and have been revived from as deep as 14 meters in permafrost. The preferred habitat for *S. keyserlingii* is taiga forest and riparian zones in tundra and forest steppe, all habitats that occur extensively throughout interior Alaska. Because Alaska and Siberia have been repeatedly connected by land bridges over the last several million years, the most recent of which remained intact until some 10,000 years ago, it is not unreasonable to expect that the species may have been able to migrate to Alaska, and that relict populations might remain.

BYERS LAKE RETREAT

YOU'RE INVITED!

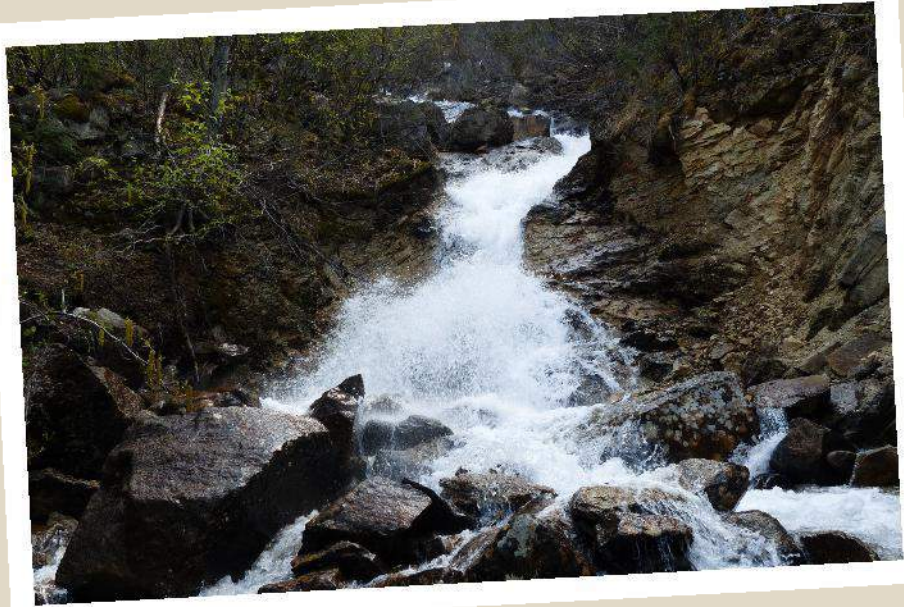
April 21-23 2017

Byer's Lake Campground
Denali State Park

We have reserved a cabin at Byer's Lake campground in Denali State Park for a spring-time herp outing! Consider joining us on April 21-23 during prime wood frog calling season. Last year's outing featured brats and beer, a dip in the lake, a hike to a waterfall, and a run-in with a cocky sub-adult black bear giving chase to a panicked moose cow and calf!

For more information and to reserve your spot, contact AHS president Don Larson
djlarson@alaska.edu

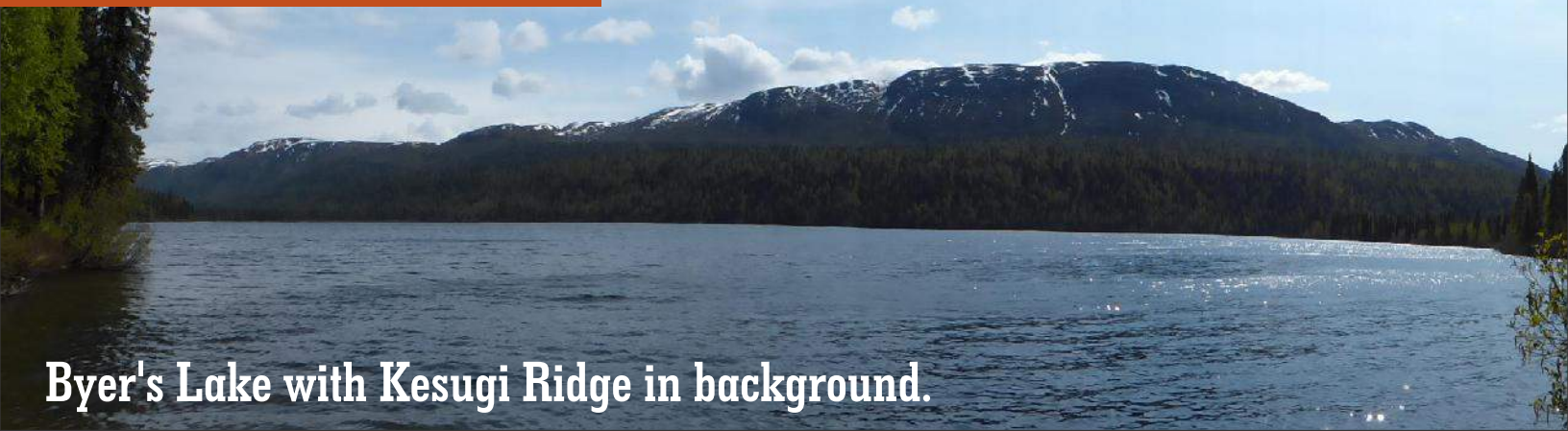
Cascade Trail, a short hike around to Byer's Lake and up the ridge towards Kesugi Trail.



Alaska Range as seen from Kesugi Ridge.



Byer's Lake with Kesugi Ridge in background.





2016 field trip attendees collecting data at a potential wood frog breeding site.

HERPGEAR



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The AHS 2017 t-shirt features a boreal toad logo on the front and the Alaska Worm Salamander on the back. They are 6.1 oz. shirts.

ORDER AT: AKHerpSociety.org/apps/webstore

These excellent t-shirts are available for a limited time. The design was inspired by member Alexis Capel. Help to support AHS by purchasing one or more today!



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\$3

ECOLOGICAL NOTES ON THE MALLARD SLOUGH LONG-TOED SALAMANDER POPULATION IN SOUTHEAST ALASKA.

Bradford R. Norman

*Abstract – I field collected a sample of *Ambystoma macrodactylum* ($N=ca. 56$) in 1992 from mostly Mallard Slough, a mainland SE Alaska Site, just North of the Stikine River Delta. However, I also collected one from Andrew Slough, a few from Sokolof Island, and have two from Farm Island. My sample includes: collected ova, observed egg clusters, collected and observed larvae, collected sub-adults, and collected adults. Herein I present some minimal notes regarding field observations and some laboratory dissections conducted to determine the diet of the salamanders collected. I could not find this species in my extensive 1991 work on Mitkof Island, Big Level Island, Kuprenof Island, etc. My 1991 specimens of other Amphibians from SE Alaska are available in the James R. Slater Natural History Museum, 1500 Warner Avenue, Tacoma, WA. I was able to examine all of Hodge's material in Ketchikan, AK in 1992 also. That collection is now in the Fairbanks, Univ. of Alaska Aquatic Collection, and only contained a few specimens ($N=3$) from Twin Lakes, Stikine River, and a few from British Columbia. I reported on the Taku River *Ambystoma* population observed in the previous NOAA Auke Bay Fisheries Lab amphibian collection in a previous paper (Norman, 2004). I think that NOAA Auke Bay Lab collection has been moved to Fairbanks as well, the amphibian parts that is. In any case I propose to send my remaining 1992 Alaska Amphibian Collection to the Fairbanks CAquatic Collection also. I only require funding to do so.*

DIET. I carefully dissected nine ($N=9$) mostly adults and examined, tabulated and in some cases measured the diet items. I also tried to measure the stomach, intestine and cloacal contents and sizes individually and determine the sex of each specimen. I also examined gonads in each salamander when determinable. I used a binocular microscope. I discovered about 22 different diet items identifiable within the nine specimens dissected. The following is a partial list of the contents observed: few small earthworms and other annelids/nematodes (?); few soil mites (Orbatids, etc.); few *Aranea* (spiders); few centipedes; few small snails (but one was full of small *Physella*-like aquatic snails) and few mayflies' larvae (but one only with mayflies), isopods, chironomid larvae, midges, small flies, mayfly larvae, small pieces of plant debris (=grass, moss, root, sedge?), small grains of sand; small grit mud (especially packed in some cloacae); one small slug (*Prophysaon andersoni*) was taken in one salamander.



Figure 1. Author, Bradford R. Norman, driving the survey boat back to Wrangell from the Stikine River, through the Alexander Archipelago Islands, ca. 1 July 1992. Photograph by Tammi Stough, USFS, Wrangell Ranger District, SE Alaska.

Figure 2. Some colorful *Ambystoma macrodactylum* adults ($N=3$) from small ponds closest to Cabin at Mallard Slough, Stikine River, during the Spring/Summer 1992 surveys. Photograph by Gregory Curtis Norman and Bradford R. Norman.



feet long, in the Mallard Slough inter-tidal zone for high tides and storm winds.

MICRO-HABITAT SITES.



WATER MOLD INFECTED EGG MASSES.

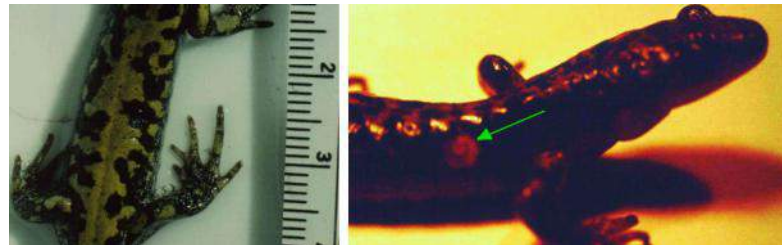
I observed white water mold infested *Ambystoma* egg-masses at Cheliped Bay, just north of my Mallard Slough monitoring sites. Also I saw some indications in very few eggs observed at Sokolof Island in 1992. And at Mallard Slough sites. The older *Ambystoma* eggs that don't hatch, seem to get the white water mold. My observations on this were primitive and the subject is becoming more recognized and specialized for sampling techniques.

PARASITES. One lab experiment where one adult salamander and one adult leech of about the same size and mass were confined revealed that leeches will feed on adult *Ambystoma* in a small container, within minutes after attaching. The subjects were found in the same small pool at Mallard Slough within the same dip net stroke. The pool was only a few feet across and about 8

Some smaller leeches were also seen on wood frogs (Chief Shakes Hot Springs, Stikine River Area), and on western toads in the study area around the Stikine River and its Delta in 1992 (this study). In nearby populations of western toads, parasitic flesh flies were observed on Kuiu Island, Kuprenof Island and seen in a 1981 sample at the Univ. of Puget Sound Herpetological Collection in 1991, 1992. My fly larvae-infested toad specimens are there as well, marked year 1991. One larval salamander was observed to be preyed upon by water beetles in a minnow trap set at a pond at Mallard Slough in Summer 1992.

During the Mallard Slough salamander dissections, some non-prey item parasitic worms (trematodes or nematodes?) were discovered and preserved. These have not been sent off for identification or analyzed further, but I would like to send them to the US National Museum amphibian parasite lab for further work in the future. They were small, thin, with tapering ends and about 11 to 15 mm in total length, and about 1 to 2 mm in maximum diameter. Some were found in the stomach and some in the cloaca of at least two salamanders out of nine dissected.

DEFORMITIES. One adult salamander exhibits fused toes on one hind foot, out of a series from the Mallard Slough Site. No full deformity analysis has been done on my Alaskan *Ambystoma* samples. Another salamander appears to have a partial toe that comes out from the side of a hind toe.



One adult specimen taken at Mallard Slough and sent to Berkeley, CA lab for genetic analysis in 1992 had a singular circular pink blotch about 4 mm in diameter inclusive within the dorsal coloration, which appeared unusual for the species, and the population. Some specimens were observed to have tail scars perhaps as a result of attempted predation but these are not detailed here.

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ACKNOWLEDGEMENTS.

I thank Dr. Thomas Hassler (Humboldt State University, CA); Thomas A. Kirk (MS, HSU); Dr. Barry Roth (PhD, Berkeley, CA); USFS Fisheries Biologist LeRoy Cyr (MS, Fisheries); etc. for letting me ride on their great coat-tails of Discovery ! Thanks for jobs and friends along the way. I Thank Roger Parker Hodge for talking to me as a young man calling him unexpected on the phone; I thank the Dr. Robert C. Stebbins, for accepting my specimens and his correspondence. He is now an ICON of herpetological achievement and knowledge over the last estimated 90 years.

Bradford Norman worked in the Alaskan Fisheries Industry from 1980 through 1991 and attended University of Puget Sound as a pre-medical biology major from 1986 through 1991. In 1991 and 1992 he field-studied amphibians in southeast Alaska under the auspices of the US Forest Service and US Fish & Wildlife Service.

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RECENT PUBLICATIONS



Surdyk, S.L, and Evans, S.A. 2016. Amphibian Surveys at Klondike Gold Rush NHP: 2016 Summary. Natural Resource Report NPS/KLGO/NRR—2016/XXX . National Park Service, Fort Collins, Colorado.

Abstract- Amphibian monitoring has been conducted annually at Klondike Gold Rush National Historical Park since 2004 with the primary goal to monitor long-term changes in amphibian distribution, abundance, reproduction, and survival at core breeding sites. The Park has two confirmed amphibian species, the boreal toad (*Anaxyrus boreas*, formerly *Bufo boreas*) and the Columbia spotted frog (*Rana luteiventris*); however, toads are the primary focus of monitoring efforts due to their relative abundance in the Taiya River watershed. In 2016, the monitoring season spanned for about two and a half months from May 24 to August 10. A total of 31 routine Visual Encounter Surveys were conducted at eight intensive core breeding sites in Dyea and West Creek, and five intensive non-core sites in Dyea, West Creek, Lost Lake, and the Chilkoot Trail. A total of 29 Visual Encounter Surveys were conducted at 22 extensive breeding sites in White Pass. Breeding activity was observed at four of the core sites. A total of 22 adult boreal toads (2 of which were in amplexus), 2 egg masses, ~ 82,000 tadpoles, 892 juveniles, and 918 metamorphs were observed. One adult Columbia spotted frog was discovered at White Pass at the Pumphouse Lake site (WP01) on August 10.

Cryoprotectant Production in Freeze-Tolerant Wood Frogs Is Augmented by Multiple Freeze-Thaw Cycles DJ Larson, BM Barnes - Physiological and Biochemical Zoology, 2016

Abstract- Ice nucleation across the skin of wood frogs (*Lithobates sylvaticus*) rapidly induces endogenous production of glucose, a cryoprotectant necessary for freeze tolerance. In laboratory studies of freeze tolerance, wood frogs are cooled slowly, often at $-0.05^{\circ}\text{C h}^{-1}$, to facilitate high cryoprotectant production and survival. Under natural conditions in Alaska, however, wood frogs accumulate maximal tissue glucose concentrations while cooling at much faster rates, -0.35° to $-1.6^{\circ}\text{C h}^{-1}$, and in addition undergo multiple successive freeze-thaw cycles before remaining frozen for the winter. We examined whether simulating these ecologically relevant cooling rates and repeated freeze-thaw events in captive wood frogs results in the high glucose concentrations found in naturally frozen wood frogs. We found that over successive freezing and thawing events, glucose concentrations increased stepwise in all measured tissues. Short thawing periods did not result in a statistically significant decline of glucose concentrations. Wood frogs that experienced three freeze-thaw events had fresh weight glucose concentrations that approached values found in tissues of wood frogs frozen in natural conditions. Laboratory wood frogs survive frozen for 2 mo, while wood frogs frozen under natural conditions survive frozen for up to 7 mo at temperatures below -18°C . We hypothesize that repeated freeze-thaw cycles with rapid cooling and warming rates allow for greater survival in Alaskan wood frogs through enhanced cryoprotectant production.



Sand Lake Park runs along the western border of Sand Lake Elementary School and is easily accessible from the school. This park is habitat for one of three species of frog found in Alaska, as well as numerous species of native plants, birds, fish, and other wildlife.

SAND LAKE ELEMENTARY PARTNERSHIP



AHS is continuing to partner with Sand Lake Elementary School to create science curriculum and an outdoor classroom in Sand Lake Park. While we were unsuccessful in acquiring a grant for this purpose last year, we are trying again this year and using existing resources to provide science opportunities!

This spring AHS is planning to install an amphibian call monitor to record Wood Frog breeding activity!

Please take a look at Sand Lake Elementary's vision for the park by visiting their site at :

<http://anchorageparkfoundation.org/sand-lake-park-makeover-project-sand-lake-elementary/>

The students did a class project to create "report cards" for the park and subsequently developed a "makeover" plan based on their findings. Very impressive!



KLONDIKE GOLD RUSH AMPHIBIAN MONITORING REPORT

by Jami Belt
National Park Service

National Park managers use many indicators to understand and help maintain the integrity of park natural resources. Amphibians are considered good indicators of ecosystem health because they are sensitive to environmental change. Two amphibian species have been documented and confirmed within Klondike Gold Rush National Historical Park: the western toad (*Bufo boreas*), and the Columbia spotted frog (*Rana luteiventris*). Because of its relative abundance in the Taiya river watershed, the western toad is the primary focus of amphibian monitoring efforts in the park. Core breeding sites have been identified from previous years' inventory and monitoring efforts in the Dyea area. Monitoring is conducted annually at regular intervals between April and October, coincident with the breeding cycle. Data is collected through routine Visual Encounter Surveys, Adult Toad Capture and Re-Capture, and chytrid fungus testing. Body measurements are recorded for captured adult amphibians. Data is also collected on breeding phenology, egg mass locations, breeding site occupancy, predation, and habitat characteristics.

Western toads occupy different habitats depending on the season. In the spring, toads gather in breeding ponds, then move to upland aquatic habitats until winter, when they will hibernate in terrestrial forests. Female toads will appear at the breeding sites every 2 to 3 years. In Southeast Alaska, toads congregate in warm, shallow ponds to lay their eggs. Schools of small, black tadpoles can often be seen swimming around shallow ponds in the park. The water levels in these ponds may fluctuate greatly throughout the season, but relatively permanent water is needed for successful development of the eggs and larvae. Abundance and use of breeding ponds may fluctuate between years, so the continuation of a long-term monitoring program is useful for understanding the local population dynamics.



A larval dragonfly preying on a Boreal Toad tadpole. Amphibians are an important part of both aquatic and terrestrial food-webs. They are often referred to as an ecological "conveyor belt," because their life-cycle allows them to transport nutrients from the aquatic environment to upland habitats. Darner dragonflies are just one of a whole host of predators that depend on Boreal Toad tadpoles as a seasonal food supply.



Watch your step! Boreal Toad tadpoles at breeding ponds in Dyea are beginning to metamorph into toadlets. During a single survey on July 15th, over 18,000 metamorphs were detected at one breeding pond. On sunny days, metamorphs will form massive piles along the shoreline of their natal pond for warmth and protection. By early August, these little guys will begin dispersing to upland habitats for the winter. This is the time period during which Boreal Toads are most sensitive to human disturbance. The survival rate of metamorphs has been found to have a greater impact on population trends than the survival rate of any other life stage.

FROM THE INTERIOR

AHS members Don Larson and Mark Spangler show museum specimens to attendees of the 2015 Science Potpourri at the University of Alaska Fairbanks campus.



Photo: UAF College of Natural Science and Mathematics

AHS maintains a strong presence in Fairbanks, a truly final frontier for herp enthusiasts! Our members can be seen manning tables at spring-time community events such as UAF's Science Potpourri and the Creamer's Field Migration Celebration. They organize unique workshops like family crafts at the Museum of the North and training volunteers for participation in the FrogWatch USA program. They even visit schools and work with educators like 2016 AHS grant recipient Melanie Hinzman to teach school children about herps in Alaska. Look for us this spring - when the frogs start calling we won't be far behind!



**FROGCRESTS
ON TOTEMS IN
SOUTHEAST**



DID YOU KNOW?

In the 4th edition of the Northern Herp Chronicles, we shared a rare report of a leatherback sea turtle (*Dermochelys coriacea*) sighted in 2013 near Yakutat, AK. In the 5th edition, we followed up with a brief history of marine turtle sightings in Alaska. In this, our 6th edition, we continue the tradition by sharing another report of a leatherback sea turtle in Alaska waters, sighted in 2015 near Prince of Wales Island. The report is documented by the Local Environmental Observer (LEO) Network of the Alaska Native Tribal Health Consortium. We encourage all members to report unusual sighting of herps (out-of-range species, early- and late-season observations, malformed individuals, etc.) to the LEO Network!

<https://www.leonetnetwork.org/en/posts/show/827F772E-BD6D-47C3-8FBE-AEB9CF134D3D>

FIRST TO FIND [OR HEAR] CONTEST!



Once again AHS is sponsoring a first to find or hear contest for spring emergence of Wood Frogs in Alaska. In the past, we have identified just one winner in the state. This year however, we will not only have a statewide winner, but also one for each of these regions – Interior, Southcentral, Yukon-Kuskokwim Delta, Northwest Arctic, North Slope, Copper River Basin, Prince William Sound, and Southeast. In addition for 2017, for those living in Prince William Sound or Southeast, your observations can be of ANY wild amphibian, not just Wood Frogs!

How to Participate: Keep your eyes and ears open for the presence of frogs when you are out and about this spring. If you find a frog, take a picture of the animal (or habitat if you cant find it or get close), or record the audio on your phone or other device. Also be sure to write down your location, the weather, the date, the time, and any other pertinent information. When you get back to a computer, submit your information on our website at <http://www.akherpsociety.org/vouchersubmission.htm>.

What you win: Regional winners will receive a complimentary 1-year membership in AHS. The statewide winner will receive a complimentary 1-year membership AND an AHS t-shirt! All winners will be recognized on our website and in the next issue of the Northern Herp Chronicles.

VISIT OUR WEBSITE
AKHERPSOCIETY.ORG
TO SUBMIT AN ARTICLE FOR FUTURE
HERP CHRONICLE ADDITIONS

