

*Canadian Amphibian and Reptile Conservation Network
Réseau Canadien de Conservation des Amphibiens et des Reptiles
19th Annual Meeting*

*Canadian Association of Herpetologists
23rd Annual Meeting*



Chris Hamilton

Saskatoon, Saskatchewan 2009

CARCNET/RÉCCAR and CAH 2009

This year's logo was designed by Chris Hamilton, an entomologist who studied mosquito behaviour at Trent University.. Chris was inspired by the complex colouring of the Bullsnake (*Pituophis catenifer*) and how reflective its colours are of its prairie surroundings. Its dorsal pattern lent itself well to incorporating the meeting location and year into the design.

The Bullsnake occurs in grassland and sagebrush habitats of southwestern Saskatchewan and southeastern Alberta. It is considered a Data Deficient species by COSEWIC due to poor information on its population sizes. In Alberta, the species is designated as Sensitive where populations may be declining due to habitat loss and fragmentation.

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ACKNOWLEDGEMENTS AND SPONSORS

Local Planning Committee:

- Andrew Didiuk (lead)
- Bruce Pauli
- Sara Ashpole
- David M. Green
- Lea Craig-Moore
- Doug Forsyth
- Kelley Kissner

Thanks to:

- Christine Bishop
- Jacqueline Litzgus
- Heather Andrachuk
- Tana McDaniel
- Beverly Horn
- Kerrie Serben
- Gabriel Blouin-Demers
- Pat Gregory
- Stephen Hecnar
- Robert Sissons
- Shelley Doucet-Larson
- Pat Fargey
- Wes Olson
- Members of the COSEWIC Amphibians and Reptiles Subcommittee

CARCNET/RÉCCAR and CAH 2009

FRIDAY 25 September 2009

0900-1700 COSEWIC AMPHIBIANS AND REPTILES SUBCOMMITTEE MEETING

1800-2200 REGISTRATION, POSTER SETUP AND SOCIAL

SATURDAY 26 September 2009

0800-0840 REGISTRATION

0830-0840 Opening Remarks

SESSION 1 MITIGATING HUMAN IMPACTS ON TURTLES

Chair: Sara Ashpole, University of Waterloo

0840-0900 IMPACT OF RECREATIONAL POWER BOATING ON TWO POPULATIONS OF NORTHERN MAP TURTLES (*GRAPTEMYS GEOGRAPHICA*)

Grégory Bulté, Marie-Andrée Carrière and Gabriel Blouin-Demers*

0900-0920 EFFECTS OF HUMAN RECREATION ON THE POPULATION ECOLOGY AND SPATIAL BEHAVIOUR OF TURTLES IN AN ONTARIO PARK

Jolene Laverty* and Jacqueline D. Litzgus

0920-0940 TURTLE ROAD MORTALITY MITIGATION AS PART OF THE LONG POINT CAUSEWAY IMPROVEMENT PROJECT

Crystal A. Robertson

0940-1000 ASSESSING THE USE OF ARTIFICIAL NESTING SITES AS A CONSERVATION TOOL FOR TURTLES IN ALGONQUIN PARK, ONTARIO

James E. Paterson*, Brad Steinberg and Jacqueline D. Litzgus

1000-1020 BREAK

SESSION 2 AMPHIBIAN ECOLOGY AND CONSERVATION

Chair: Stephen Hecnar, Lakehead University

1020-1040 BODY SIZE VARIATION AND SIZE-ASSORTATIVE MATING IN ANURANS

David M. Green

1040-1100 USING STABLE ISOTOPES TO EXPLORE THE ECOLOGY AND FUNCTIONAL ROLE OF TADPOLES

Arthur V. Whiting* and Cynthia A. Paszkowski

1100-1120 *BATRACHOCHYTRIUM DENDROBATIDIS* IN PRINCE EDWARD ISLAND FROGS

María J. Forzán*, Natacha S. Hogan, Raphaël V. Vanderstichel and Kevin L. Teather

CARCNET/RÉCCAR and CAH 2009

- 1120-1140 **CONTEXT-DEPENDANT EFFECTS OF RANAVIRAL INFECTION ON LIFE HISTORY OF THE NORTHERN LEOPARD FROG**
Pierre Echaubard*, Kevin Little and David Lesbarrères
- 1140-1200 **ATRAZINE IN THE ENVIRONMENT AND IMPLICATIONS FOR AMPHIBIANS (AND REPTILES)**
Christine A. Bishop*, Tana V. McDaniel and Shane R. de Solla
- 1200-1320 **LUNCH**
- SESSION 3 MONITORING PROGRAMS AND TOOLS**
Chair: Jacqueline D. Litzgus, Laurentian University
- 1320-1340 **LONG-TERM TRENDS IN SOUTHWESTERN ONTARIO POND AMPHIBIAN METACOMMUNITIES**
Stephen J. Hecnar* and Darlene R. Hecnar
- 1340-1400 **THE ONTARIO HERPETOFAUNAL ATLAS PROGRAM - PROVINCIAL SCALE CITIZEN SCIENCE**
Joe F. Crowley* and John W. Urquhart
- 1400-1420 **SKINK WATCH: INVOLVING STAKEHOLDERS IN REPTILE MONITORING**
Allison M. Krause Danielsen* and Pamela L. Rutherford
- 1420-1440 **EASTERN MASSASAUGA RATTLESNAKE MONITORING ON THE BRUCE PENINSULA**
Dan Harvey* and Frank Burrows
- 1440-1500 **SLITHER UNDER ROOF: USE OF ARTIFICIAL COVER TO SURVEY A CRYPTIC SNAKE SPECIES, THE NORTHERN RIBBON SNAKE (*THAMNOPHIS SAURITUS SEPTENTRIONALIS*)**
Jose Lefebvre* and Stephen W. Mockford
- 1500-1520 **HIBERNATION IN SMALL-BODIED SNAKES IN SOUTHWESTERN MANITOBA**
Pamela L. Rutherford*, Nicholas Cairns, Chelsea Jaeger and Drew J. Hoysak
- 1530-1700 **POSTER SESSION**
- 1900-2300 **BANQUET, BANQUET PRESENTATION, PRESENTATION OF SILVER SALAMANDER AWARD AND CARCNET SCHOLARSHIP, AND HERP QUIZ**
Presentation: SNOW AND WIND: RECRUITMENT OF WOOD FROGS FROM NORTHERN PRAIRIE WETLANDS DURING A WET-DRY-WET CYCLE
David B. Donald, Environment Canada, Water Quality Monitoring Division, Regina, SK

CARCNET/RÉCCAR and CAH 2009

SUNDAY 27 September 2009

0800-0840 **REGISTRATION**

0830-0840 Opening Remarks/Announcements

SESSION 4 HABITAT ASSESSMENT AND BIOGEOGRAPHY I

Chair: Gabriel Blouin-Demers, University of Ottawa

0840-0900 **EVALUATING PREDICTIVE HABITAT MODELS BASED ON PRESENCE/ABSENCE DATA FOR THE THREATENED SPRING SALAMANDER, *GYRINOPHILUS PORPHYRITICUS*, IN QUÉBEC, CANADA**
Jay Ploss

0900-0920 **THE EFFECT OF FLOODING ON THE SPATIAL ECOLOGY AND THERMOREGULATION OF SPOTTED TURTLES (*CLEMMYS GUTTATA*) IN A SOUTHERN ONTARIO POPULATION**
Katharine Yagi* and Jacqueline D. Litzgus

0920-0940 **SITE FIDELITY, INDIVIDUALITY, AND SCALE OF HABITAT SELECTION MAY COMPLICATE THE DESIGNATION OF SPOTTED TURTLE HABITAT IN ONTARIO**
Megan L. Rasmussen* and Jacqueline D. Litzgus

0940-1000 **FRESHWATER TURTLE SURVIVAL STRATEGIES UNDER ICE**
Jacqueline D. Litzgus*, Christopher B. Edge and William F. Greaves

1000-1020 **BREAK**

SESSION 5 HABITAT ASSESSMENT AND BIOGEOGRAPHY II

Chair: Gabriel Blouin-Demers, University of Ottawa

1020-1040 **THE USE OF SMALL EPHEMERAL WETLANDS BY AMPHIBIANS IN THE MIXEDWOOD FOREST OF BOREAL ALBERTA**
Godwin E. Okonkwo*, Cynthia A. Paszkowski and Brian R. Eaton

1040-1100 **THERE'S NO PLACE LIKE HOME: REFUGE MICROSITE CHARACTERISTIC SELECTION EXHIBITED BY BOREAL TOADS (*ANAXYRUS BOREAS BOREAS*)**
Zachary L. Long* and Ellie E. Prepas

1100-1120 **BOREAL TOAD HABITAT USE IN THE BOREAL MIXEDWOOD FOREST OF NORTHERN ALBERTA**
Brian R. Eaton

1120-1140 **CONSERVING LONG-TOED SALAMANDERS (*AMBYSTOMA MACRODACTYLUM*) USING UNDER-ROAD TUNNELS IN WATERTON LAKES NATIONAL PARK**
Katie S. Pagnucco*, Cynthia A. Paszkowski and Garry J. Scrimgeour

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1140-1200 **GROUP PHOTO**

1200-1320 **LUNCH**

SESSION 5 CONTINUED

Chair: Bruce Pauli, Environment Canada, National Wildlife Research Centre

1320-1340 **COMPARISON OF TECHNIQUES FOR DEFINING THE CRITICAL HABITAT OF THE NORTHERN PRAIRIE SKINK (*EUMECES SEPTENTRIONALIS*)**
William C.J. McFadden* and Pamela L. Rutherford

1340-1400 **INVESTIGATING THE PHYLOGEOGRAPHY OF THE GREATER SHORT-HORNED LIZARD (*PHRYNOSOMA HERNANDES*) IN ALBERTA**
Magdalene N.Y. Leung* and Anthony P. Russell

1400-1420 **THE FROG FILTER: AMPHIBIAN INTRODUCTION BIAS DRIVEN BY TAXONOMY, BODY SIZE, AND BIOGEOGRAPHY**
Reid Tingley*, Christina M. Romagosa, Fred Kraus, Benjamin L. Phillips and Richard Shine

SESSION 6 SPECIES RECOVERY AND CONSERVATION

Chair: Bruce Pauli, Environment Canada, National Wildlife Research Centre

1420-1440 **NORTHERN LEOPARD FROG RECOVERY PROGRAM AND STEWARDSHIP IN ALBERTA, CANADA**
Kris Kendell

1440-1500 **ECOLOGICAL RESTORATION IN A DEGRADED LANDSCAPE: CONNECTING AMPHIBIAN BREEDING AND UPLAND TERRESTRIAL HABITAT**
Sara L. Ashpole*, Christine A. Bishop and Stephen D. Murphy

1500-1520 **STOCHASTIC POPULATION VIABILITY ANALYSES FOR AN ENDANGERED FRESHWATER TURTLE, *CLEMMYS GUTTATA***
Jean J. Enneson and Jacqueline D. Litzgus*

1520-1540 **THE TERRESTRIAL WETLAND GLOBAL CHANGE RESEARCH NETWORK (TWGCRN)**
Bruce D. Pauli

1540-1600 **WHAT'S ON THE MENU? GROWTH RATE VARIATION AND PHENOTYPIC PLASTICITY IN LEOPARD GECKO, *Eublepharis macularius***
Christopher Gauthier, David Lesbarrères*

1600-1700 **GENERAL MEETING**

MONDAY AND TUESDAY 28-29 September 2009

All day **FIELD TRIP TO GRASSLANDS NATIONAL PARK**

CARCNET/RÉCCAR and CAH 2009

CARCNET/RÉCCAR and CAH 2009 POSTERS

BODY SIZE IN RELATION TO DIET AND GEOGRAPHIC LOCATION IN GARTER SNAKES (*THAMNOPHIS* SPP.)

James H. Baxter-Gilbert* and Jacqueline D. Litzgus

EFFECTS OF BODY MASS AND TEMPERATURE ON THE STANDARD METABOLIC RATE OF THREE SPECIES OF COLUBRID SNAKES

Hillary Black and Jacqueline D. Litzgus*

CHARACTERIZATION OF THE REPRODUCTIVE CYCLE IN FEMALE VEILED CHAMELEONS (*CHAMAELEO CALYPTRATUS*) BY ANALYSIS OF FECAL HORMONE METABOLITES

Christine I. Gilman*, Maya S. Kummrow, Paula M. Mackie and Gabriela F. Mastromonaco

TRENDS IN AMPHIBIAN BREEDING CALL AND REPTILE EMERGENCE DATES AT THE OJIBWAY PRAIRIE IN RELATION TO CLIMATE CHANGE

Stephen J. Hecnar, Paul D. Pratt and Darlene R. Hecnar*

HABITAT SELECTION OF THE EASTERN YELLOW-BELLIED RACER (*COLUBER CONSTRICTOR*) AND BULLSNAKE (*PITUOPHIS CATENIFER*) IN SOUTHERN SASKATCHEWAN

Jessica A. Martino*, Chris M. Somers and Ray G. Poulin

MODELING ROAD MORTALITY OF PRAIRIE RATTLESNAKES AND BULLSNAKES IN ALBERTA

Adam J. Martinson and C. Cormack Gates (Authors not in attendance. Presented by Andy Didiuk)

THE USE OF SMALL EPHEMERAL WETLANDS BY AMPHIBIANS IN THE MIXEDWOOD FOREST OF BOREAL ALBERTA

Godwin E. Okonkwo*, Cynthia A. Paszkowski and Brian R. Eaton

IDENTIFICATION AND ASSESSMENT FOR THE NOMINATION OF POSSIBLE IMPARA SITES IN MANITOBA, CANADA

Brandi L. Prouten

HABITAT CORRELATES OF WOOD FROG (*RANA SYLVATICA*) LIFE-HISTORIES IN PONDS LOCATED THROUGHOUT AN URBANIZED LANDSCAPE

Brett R. Scheffers and Cynthia A. Paszkowski*

ABUNDANCE AND DISTRIBUTION OF NORTHERN LEOPARD FROGS (*LITHOBATES PIFIENS*) ALONG THE UPPER QU'APPELLE RIVER

Corie White, Heather Davies and Glen McMaster (Authors not in attendance. Presented by Andy Didiuk)

CONFERENCE ABSTRACTS 2009

ASHPOLE

ECOLOGICAL RESTORATION IN A DEGRADED LANDSCAPE: CONNECTING AMPHIBIAN BREEDING AND UPLAND TERRESTRIAL HABITAT

Sara L. Ashpole^{1*}, Christine A. Bishop² and Stephen D. Murphy³

¹School of Planning, University of Waterloo, Waterloo, ON, N2L 3G1, sashpole@uwaterloo.ca;

²Environment Canada, Delta, BC, V4K 3N2, cab.bishop@ec.gc.ca; ³Environment and Resource Studies, University of Waterloo, Waterloo, ON, N2L 3G1, sd2murph@uwaterloo.ca

Wetland and riparian habitat losses in the highly developed lower South Okanagan Valley exceed 90%, with 88% of remaining wetlands experiencing at least one harmful impact resulting from human actions. Since 2006, intensive wetland enhancement and restoration efforts have focused on reconnecting known amphibian-breeding habitat with newly constructed wetlands. Our goal is to increase the quantity and quality of wetland habitat on private lands, while fostering stewardship in recovery actions among private landowners and public stakeholders through conservation agreements with Ducks Unlimited Canada or The Land Conservancy of BC. Enhancement and new wetland construction sites were selected using three main criteria: close proximity (< 500 m) to known breeding populations of the Threatened Great Basin Spadefoot (*Spea intermontana*) or the Endangered Tiger Salamander (*Ambystoma tigrinum*), close proximity to waterways (< 500 m), and a minimum distance from roadways (> 100 m). In addition, control measures are taken at sites infected with the invasive American Bullfrog (*Rana catesbeiana*) or sites with predatory non-native fish species. A total of 14 new wetlands have been constructed and five wetlands have been enhanced, effectively doubling the number of wetlands in the study area. To determine project success, the enhancement and restoration sites, in addition to surrounding wetlands, are monitored annually for calling frogs, the presence of eggs, and metamorph emergence. Early signs of immigration and reproductive success for populations of the Spadefoot have been observed, with 11 project ponds producing metamorphs in spring 2009. Our project results support a “build and they will come” action, likely a response to the overwhelming lack of available breeding habitat. But still the critical upland habitat needed by amphibian species poses a significant threat to species movement and long-term population success. The impact of habitat modification and the availability of loose sandy soil, required by burrowing amphibian species, was significantly greater and often impenetrable around agricultural wetland sites and sites adjacent to road ways or developed areas.

PLATFORM

CONFERENCE ABSTRACTS 2009

BAXTER-GILBERT

BODY SIZE IN RELATION TO DIET AND GEOGRAPHIC LOCATION IN GARTER SNAKES (*THAMNOPHIS* SPP.)

James H. Baxter-Gilbert* and Jacqueline D. Litzgus

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The typical body size of an animal in a given location is dependant on a number of factors including climate, diet and gender. The garter snakes (*Thamnophis* spp.) are a group of reptiles that have a wide range, varied habitats and varied diets, which makes them excellent organisms for examining the effects of diet and geographic location on body size. We collected metadata from 22 sources across North America; the data included information on location (latitude and longitude), SVL (snout-vent length), gender and stomach contents. Diet was assessed by determining the primary prey choice, based on stomach content percentages, and ranking it on a scale of 1 to 3. The ranking scale was referred to as the Prey Acquisition and Ingestion (PAI) scale, and was based on prey size and difficulty in acquiring. Prey that were large and the most difficult to consume were ranked in category 3. We predicted that as SVL increased, the PAI would increase, as it was expected that larger snakes would be able to eat larger prey. However, when diet was compared to SVL, PAI decreased as SVL increased. When SVL was compared to the latitude of the capture site we found a positive relationship supporting Bergmann's Rule; as latitude increased so did SVL. Similar results were seen with longitude. Snakes in coastal regions with milder climates had smaller SVL than snakes from more central regions with temperate climates. Our findings demonstrate that within a given location there are differences in body size that may be attributed to dietary selection, but on a grander scale, geographic location, with respect to the climate and seasonality of the specific location, is a stronger driving force on body size.

POSTER

CONFERENCE ABSTRACTS 2009

BISHOP

ATRAZINE IN THE ENVIRONMENT AND IMPLICATIONS FOR AMPHIBIANS (AND REPTILES)

Christine A. Bishop^{1*}, Tana V. McDaniel² and Shane R. de Solla³

¹Environment Canada, Science and Technology Branch, Delta, BC, V4K 3N2, CAB.Bishop@ec.gc.ca; ²International Joint Commission, Burlington, ON, L7R 4A6, Tana.McDaniel@ec.gc.ca; ³Environment Canada, Science and Technology Branch, Burlington, ON, L7R 4A6, Shane.deSolla@ec.gc.ca

Atrazine has widespread and intensive use worldwide but this has resulted in it becoming one of the most common pesticide contaminants of both surface and ground waters. To assess its impact on wild amphibians and reptiles the challenge is that there seems to be very little interaction between aquatic ecotoxicologists and aquatic monitoring specialists. We really want to know when and how much atrazine are amphibians and reptiles exposed to during development and throughout their life and what are the effects on the aquatic food web they depend on. When field studies are conducted, they are so often limited in the diversity of pesticides measured and the exposure period evaluated is often limited to the time period when biologists are on site. In particular, the real effects of atrazine alone are difficult to discern from mixture effects given atrazine is rarely the sole pesticide wildlife is exposed to at any given location in the environment. Despite the now extensive literature examining the toxicity of atrazine to amphibians, it is the community based effects of atrazine that appear to be of greatest concern. The cascading effects of atrazine's toxicity to phytoplankton are only recently being revealed with results that have population and ecosystem level implications. The possible link between alterations in immunity and increased parasitic infections in amphibians due to atrazine presence in the environment could have global implications for amphibian survival. While still relevant, we must now go beyond the debate on effects of atrazine on individual endpoints in amphibians and focus on atrazine's broader impact in the environment where amphibians and reptiles continue to be exposed. Amphibian and reptile populations are under a multitude of stresses and habitat quality is key to their survival.

PLATFORM

CONFERENCE ABSTRACTS 2009

BLACK

EFFECTS OF BODY MASS AND TEMPERATURE ON THE STANDARD METABOLIC RATE OF THREE SPECIES OF COLUBRID SNAKES

Hillary Black and Jacqueline D. Litzgus*

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Ectotherm behaviour, as well as physiological and developmental processes, are greatly influenced by environmental temperature, and the combination of these factors may limit species distributions. We tested the effects of temperature, body mass and species on the standard metabolic rate (SMR) in three species of snakes: the Eastern Garter Snake (*Thamnophis sirtalis sirtalis*), the Northern Red Belly Snake (*Storeria occipitomaculata*) and the Smooth Green Snake (*Liochlorophis vernalis*). CO₂ production was measured in the lab at 15°C, 20°C and 25°C using a flow-through respirometer. We predicted that as temperature and body mass increased, SMR would increase for all three species. We hypothesized that SMR would differ among snake species when controlling for body size because different species have different feeding ecologies, which in turn affect digestion and therefore metabolic rate. As expected, SMR increased with temperature and body mass, but did not differ among species. The lack of species differences may be because of a phylogenetic effect as all species examined were from one family, the Colubridae. Q₁₀ values were similar among all three species (~5), and were slightly higher than those reported for other vertebrate ectotherms. Our findings generally agree with other examinations of reptile metabolism, although no previous studies have tested SMR in frequently-feeding, small-bodied snake species. Future studies should concentrate on comparisons of SMR between infrequently-feeding Colubrids and frequently-feeding Colubrids.

POSTER

CONFERENCE ABSTRACTS 2009

BULTÉ

IMPACT OF RECREATIONAL POWER BOATING ON TWO POPULATIONS OF NORTHERN MAP TURTLES (*GRAPTEMYS GEOGRAPHICA*)

Grégory Bulté, Marie-Andrée Carrière and Gabriel Blouin-Demers*

Department of Biology, University of Ottawa, Ottawa, ON, K1N 6N5, gblouin@uottawa.ca

Recreational power boating is growing in popularity in North America. This activity is known to have lethal and sub-lethal effects on aquatic wildlife and freshwater turtles may be particularly sensitive to this activity. In this study, we report on patterns of traumatic injuries inflicted by powerboat propellers to Northern Map Turtles (*Graptemys geographica*) from two sites differing in boat traffic intensity in Ontario, Canada. The relative vulnerability of turtles was assessed, in light of seasonal patterns in boat traffic, as a function of sex and age specific movement patterns, habitat use and basking behaviour obtained by radio telemetry. Population viability analyses (PVA) were also conducted to evaluate the potential demographic consequences of mortality induced by powerboats. The prevalence of propeller injuries was two to nine times higher in adult females than in adult males and juvenile females. Patterns of movement, habitat use and aquatic basking indicated that adult females are more exposed to collisions with boats. PVA showed that boat-induced mortality in adult females could lead to rapid population extinction if the risk of mortality when hit by a boat is >10%. Collectively, the results of this study showed that recreational power boating is a serious threat to Northern Map Turtles, even under moderate boat traffic. The need to adopt measures restricting boat traffic in areas important to turtles is discussed.

PLATFORM

CONFERENCE ABSTRACTS 2009

CROWLEY

THE ONTARIO HERPETOFAUNAL ATLAS PROGRAM – PROVINCIAL SCALE CITIZEN SCIENCE

Joe F. Crowley* and John W. Urquhart

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Ontario Nature, in partnership with the Eastern Ontario Model Forest, Natural Heritage Information Centre, Toronto Zoo, Ontario Ministry of Natural Resources and several other organizations, has launched a new Ontario Herpetofaunal Atlas Program. After a successful pilot project in the five easternmost Ontario Counties, the atlas was launched province-wide this spring. The previous Ontario Herpetofaunal Summary Atlas provided extensive information about the distribution of Ontario's herpetofauna. However, much of that information is now considered "historic" and needs to be updated. Furthermore, the local distribution of species is still unknown in many areas and new populations of rare species are still being discovered. The atlas is a citizen science program that is soliciting the help of the public to report observations of reptiles and amphibians throughout Ontario. We are also working with many existing groups that are already surveying or monitoring Ontario's herpetofauna to incorporate pre-existing data into the atlas. The goal of the new Ontario Herpetofaunal Atlas Program is to improve our understanding of the current distribution and abundance of Ontario's reptiles and amphibians, and to make these data readily available to conservation organizations. This program will address urgent actions identified in recovery strategies by filling in knowledge gaps so that planning and management decisions, stewardship and research will be better informed. A more complete understanding of herpetofaunal species distribution and abundance will also provide important baseline data that will help us monitor and evaluate the status of populations over time. An online atlas will be published and updated on our website (http://www.ontarionature.org/herpetofaunal_atlas.html) each year and will include species accounts, updated range maps, photo galleries, partner programs and much more.

PLATFORM

CONFERENCE ABSTRACTS 2009

EATON

BOREAL TOAD HABITAT USE IN THE BOREAL MIXEDWOOD FOREST OF NORTHERN ALBERTA

Brian R. Eaton

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Understanding the distribution and abundance of Boreal Toads (*Bufo boreas*) in relation to habitat and disturbance patterns in the industrially-active boreal mixedwood forest is critical for successful management for the continued existence of this species in the region. Habitat needs of the Boreal Toad are relatively complex, including aquatic breeding and terrestrial foraging habitats, specific microhabitat types for overwintering, and corridors to allow movement between habitat types. Recent research from central Alberta suggests that toad hibernation sites may be limiting. We lack data on the habitat needs of this species in the western boreal forest, making it difficult to manage resource extraction activities to minimize impacts on toad populations. To determine how toads use available habitat and respond to industrial activity in the boreal mixedwood we are radio-tracking toads in an area of active oil and gas extraction near Peace River, Alberta. GIS analysis of movement and habitat selection data will be done to build a model of Boreal Toad habitat use, which can be used to mitigate the impact of resource extraction on this species. We are also surveying aquatic habitats in the study area to determine if borrow pits are potential mitigation tools during resource extraction, or if they are ecological traps for amphibians. Borrow pits are formed during road building; these pits fill with water, creating breeding sites that are heavily used by Boreal Toads. Determining if these pits are viable larval habitat or ecological traps is critical if managers are to make well-informed decisions that have positive impacts on local amphibian populations, rather than produce population sinks where breeding effort is wasted because larvae do not survive to metamorphosis, or metamorphs are too small to survive the winter. Here I report on three seasons of toad tracking in boreal Alberta.

PLATFORM

CONFERENCE ABSTRACTS 2009

FORZÁN

BATRACHOCHYTRIUM DENDROBATIDIS IN PRINCE EDWARD ISLAND FROGS

María J. Forzán^{1*}, Natacha S. Hogan², Raphaël V. Vanderstichel³ and Kevin L. Teather²

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Batrachochytrium dendrobatidis (*B.d.*), the fungus responsible for the disease known as chytridiomycosis, has caused the decline or extinction of approximately 200 frog species worldwide. It is present in Australia, Europe, Africa, South and North America, including Nova Scotia and New Brunswick, two of the three Maritime Provinces of Canada. To determine whether the fungus is present in Prince Edward Island, 17 ponds across the province were sampled during the summer of 2009. Skin swabs were collected from a total of 114 individuals, including 93 Green Frogs (*Lithobates clamitans*, formerly *Rana clamitans*), 20 Northern Leopard Frogs (*Lithobates pipiens*, formerly *Rana pipiens*) and one Wood Frog (*Lithobates sylvaticus*, formerly *Rana sylvatica*). The samples were preserved and transported in 70% ethanol and assayed by Pisces Molecular (Colorado, USA) for the presence of *B.d.* ribosomal RNA by PCR amplification. Twenty-five Green Frogs and five Northern Leopard Frogs tested positive for *B.d.*; the Wood Frog was negative. Eleven of the 17 ponds had at least one positive frog. Among the positive frogs, Green Frogs were more likely to have a very strong PCR signal when compared to Northern Leopard Frogs (p-value < 0.001, Fisher's exact test); in fact, there is an interaction between species and age, where younger Green Frogs have a stronger PCR signal than adult Green Frogs (p-value = 0.001, Fisher's exact test). The interaction suggests that metamorphs carry a heavier load of fungus. The overall prevalence of *B.d.* infection in the frogs in the study is estimated to be 26.3%. If the ponds in the study fairly represent all ponds in PEI, the apparent prevalence of *B.d.* in PEI lies between 18 and 34.5% (95% CI). There was no significant difference in the proportion of infected male Green Frogs when compared to female Green Frogs. Further monitoring will be required to determine what effect *B.d.* infection has on amphibian population health on Prince Edward Island.

PLATFORM

CONFERENCE ABSTRACTS 2009

GAUTHIER

WHAT'S ON THE MENU? GROWTH RATE VARIATION AND PHENOTYPIC PLASTICITY IN LEOPARD GECKO, *Eublepharis macularius*

Christopher Gauthier, David Lesbarrères*

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Abstract

In recent years geckos have become popular species in the pet trade industry. Consequently, these species have been maintained under artificial living conditions, using dietary manipulation. As natural prey is not readily available in captivity, substitute prey items are required to maintain these captive animals allowing testing the potential for environmental factors to affect the animal's phenotype. Using three different treatments, the relationship between diet and phenotypic plasticity in young siblings of leopard geckos (*Eublepharis macularius*) was investigated over a 120 day period to identify the diet that leads, when fed similar absolute fresh matter amounts, to the fastest growth rate. The first treatment was composed of a strict diet of crickets only, a second diet consisted of mealworm larvae only, and a third treatment consisted of a mixture of both mealworm larvae and crickets. We showed that geckos fed with the mealworm diet have a significantly greater body weight as well larger body traits as compared to geckos fed with crickets or a mixed diet. We also observed that diet affected the growth rate and morphological characteristics of leopard geckos therefore supporting the notion that these traits can be influenced by the resources after birth. Our study adds to the limited data concerning the effect of diet on the growth rates of captive animals and discusses the effects of the commonly suggested mixed diet of crickets and mealworms for leopard geckos.

PLATFORM

CONFERENCE ABSTRACTS 2009

GILMAN

CHARACTERIZATION OF THE REPRODUCTIVE CYCLE IN FEMALE VEILED CHAMELEONS (*CHAMAELEO CALYPTRATUS*) BY ANALYSIS OF FECAL HORMONE METABOLITES

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Reproductive failure is a significant cause of disease in female reptiles, often resulting in loss of reproductive potential or death of the animal. For a better understanding of basic reproductive biology and the development of preventative and curative protocols, enzyme immuno-assays (EIA) for estrogen (E2), progesterone (P) and testosterone (T) were validated for fecal analysis in Veiled Chameleons. Fecal samples from 46 female Veiled Chameleons were analyzed. Hormone patterns were correlated with changes in skin colour and reproductive behaviour, and, in a subset of animals, with magnetic resonance imaging (MRI) of follicular development. Approximately 24-fold increases over mean progesterone baseline values (756.05 ng/g dried feces) and 7.5-fold increases over mean E2 and T baseline values (284 and 236.97 ng/g dried feces, respectively) were associated with biological events. The results indicate a mean reproductive cycle length in Veiled Chameleons of 132 days. After a quiescent ovarian phase of 52 days, follicular growth occurs over a period of approximately 60 days that is characterized by gradually increasing E2. Ovulation follows a sudden increase in T and P around day 110. Oviposition happens three weeks later, as T and P return to baseline levels. This is the first study to validate the use of EIA for fecal reproductive hormone analysis in a reptile species. This non-invasive monitoring technique will likely prove a valuable tool for the assessment of reproductive function in other reptile species.

POSTER

CONFERENCE ABSTRACTS 2009

HARVEY

EASTERN MASSASAUGA RATTLESNAKE MONITORING ON THE BRUCE PENINSULA

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Bruce Peninsula National Park (BPNP) likely hosts one of the more secure remaining Eastern Massasauga Rattlesnake populations given the extent of protected land it contains. However, determining the status of the Massasauga population has proven difficult due to the species' cryptic nature and lack of communal hibernation. From 2004 to 2008, BPNP experimented with different survey methods (time-constrained searches, road monitoring, cover board monitoring, gestation site monitoring) to determine which might form the most informative and cost-effective basis for a monitoring program. Cover boards (wooden and metal) were ineffective at attracting Massasaugas (only five snakes located in four years). Massasaugas were found much more efficiently at gestation sites and on roads (~1 snake/hour) than in general foraging areas (0.08 snakes/hour). Road monitoring detected mostly males and gestation site monitoring detected females and neonates. Thirty-nine adult females were captured and marked at gestation sites over four years. Contrary to expectations, no marked females were recaptured at gestation sites in subsequent years, negating the effectiveness of a mark-recapture approach. Using power analysis, a severe (50%) decline in Massasaugas at 20 - 25 gestation sites could be detected about half of the time over five years and two-thirds of the time over 20 years. Surveying for occupancy, rather than abundance, at gestation sites saves time, but results in a slightly impaired ability to detect systemic declines. In 2009, BPNP implemented a monitoring program based on occupancy rates at gestation sites.

PLATFORM

CONFERENCE ABSTRACTS 2009

HECNAR

LONG-TERM TRENDS IN SOUTHWESTERN ONTARIO POND AMPHIBIAN METACOMMUNITIES

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The dynamic nature of amphibian populations and communities makes it difficult to determine if trends are occurring. Two important conservation questions are how many sites should be examined and for how long do they need to be monitored before trends can be detected? Variation in trends among sites also makes regional or large-scale approaches to species conservation necessary. We studied trends in species richness, turnover and incidence at 35 amphibian pond metacommunities in southwestern Ontario over an 18-year period to determine temporal trends. We used multiple methods and repeated surveys at individual sites to construct annual species lists. Over the study period, 14 species occurred but mean annual species richness was about 4.1 species per site (range 2 - 8). Local annual turnover remained high (~17%) throughout the study. Incidence varied among species from ubiquitous to extremely rare and some long-term subtle trends were detected. Despite a high level of species turnover at the local scale, we found that species richness and incidence showed little regional change because local trends tend to balance out at the regional scale. Mann-Kendall time series analyses were able to detect trends in amphibian populations and metacommunities, but they also revealed that these trends may play out on a scale of decades before changes in regional faunas can be detected.

PLATFORM

CONFERENCE ABSTRACTS 2009

HECNAR

TRENDS IN AMPHIBIAN BREEDING CALL AND REPTILE EMERGENCE DATES AT THE OJIBWAY PRAIRIE IN RELATION TO CLIMATE CHANGE

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Climate change can have profound and complex consequences for natural ecosystems and their component species. Potential effects of climate change on organisms are complex and variable, but some organisms may show greater response by virtue of their basic biology. Ectothermic vertebrates such as amphibians and reptiles that reside in temperate regions have complex phenologies that are strongly influenced by temperature and precipitation. We examined first call dates for breeding amphibians (3 species) and dates of first emergence from hibernation for reptiles (7 species) from the Ojibway Prairie Complex in Windsor, Ontario, over a 32-year period to determine if trends are occurring and how phenology is related to changing weather patterns. Mann-Kendall trend analyses revealed significantly earlier calling or emergence for the Western Chorus Frog, Common Gartersnake, Eastern Foxsnake and DeKay's Brownsnake, and significantly later dates for the Northern Leopard Frog, Snapping Turtle and Blanding's Turtle (marginal). Local weather records indicate a long-term trend of increasing temperature and precipitation. The four species with earlier activity all hibernate on land and the three species with later activity hibernate underwater. This pattern of activity change is consistent with differential relative heating of terrestrial versus aquatic habitats because of the high specific heat of water and increased precipitation. Differential phenological trends may alter interspecific interactions and change the structure of this herpetofaunal community.

POSTER

CONFERENCE ABSTRACTS 2009

KENDELL

NORTHERN LEOPARD FROG RECOVERY PROGRAM AND STEWARDSHIP IN ALBERTA, CANADA

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The Alberta Conservation Association is part of a provincial recovery team for the Northern Leopard Frog (NLF) (*Lithobates pipiens*, formerly *Rana pipiens*) in Alberta. The team is responsible for implementation of actions and strategies that will help maintain viable NLF populations for future generations. Population and habitat monitoring, reintroductions, habitat protection and outreach initiatives have been key actions designed to meet the objectives of the recovery plan. Results from a detailed inventory revealed that some NLF populations at the core of the species' range appear to be relatively healthy, although many populations remain isolated and at significant risk of extirpation if current habitat conditions decline. Importantly, the inventory also identified habitat threats at NLF sites. In response to identified habitat threats at select sites, we implemented five stewardship projects through the recovery plan, ranging from the installation of solar-powered and gravity-fed cattle watering systems and fencing, to spring development projects. These projects aimed to mitigate the negative impacts from cattle on important NLF habitat. Confirmed breeding ponds at each site were targeted to receive stewardship attention and represented areas of habitat that were definable and considered vital to the recruitment and maintenance of the local NLF populations of interest. All sites were managed by landholders that were interested in, and receptive of, stewardship on their properties. We also developed and installed three NLF interpretive signs for the Galt Canal Nature Trail associated with the Magrath NLF reintroduction site, within the Town of Magrath. These signs were designed to highlight the habitat needs, conservation issues and natural history of the NLF at this easily reached public site. We believe that landholders can play an important role in alleviating habitat threats that impact the NLF in Alberta. Through the implementation of cooperative stewardship agreements and projects landholders can improve habitat for the NLF, as well as realize economic benefits through improved water quality and increased productivity of their lands.

PLATFORM

CONFERENCE ABSTRACTS 2009

KRAUSE DANIELSEN

SKINK WATCH: INVOLVING STAKEHOLDERS IN REPTILE MONITORING

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Southwestern Manitoba is home to six squamate reptile species (Red-bellied Snake, Smooth Green Snake, Red-sided Garter Snake, Plains Garter Snake, Western Hognose Snake and Northern Prairie Skink). The Northern Prairie Skink is of conservation concern and was listed as Endangered by COSEWIC in 2004; there are limited data in Manitoba for several of the other snake species. Northern Prairie Skinks and Western Hognose Snakes are limited to sandy habitats, much of which occur in Spruce Woods Provincial Park and in the CFB Shilo military base. However, there is potential for extensive habitat for all squamate reptile species to exist on lands outside the park and the military base, such as privately-owned land, land purchased by non-government organizations (NGOs) such as Nature Conservancy of Canada (NCC), and First Nations land. Instead of stretching the limited time of reptile researchers, more information can be gained by providing these stakeholders with tools to monitor reptiles on their own. Protocols will be produced that are appropriate for different target audiences (e.g., general public, field biologists, website material (SOS website and Herp Atlas), Centre for Indigenous Environmental Resources (CIER), NCC). Landowners and other groups have shown great interest in skinks on their properties and often take the lead for stewardship. The monitoring protocol will enable groups to take ownership of monitoring reptiles on their own land and will in turn provide more information to researchers for recovery of Species at Risk. In summer 2009, researchers will work with private landowners and NGOs to test and refine the protocol and gain some idea of its usefulness in a practical setting. The protocol project is a preliminary step for a master's thesis which will look at reptile distribution on private land and landowner stewardship of amphibian and reptile Species at Risk.

PLATFORM

CONFERENCE ABSTRACTS 2009

LAVERTY

EFFECTS OF HUMAN RECREATION ON THE POPULATION ECOLOGY AND SPATIAL BEHAVIOUR OF TURTLES IN AN ONTARIO PARK

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Provincial parks are considered protected areas for Species at Risk, but parks also provide areas for recreational activities for people. Eco-tourism has led to an increase in the use of areas such as The Massasauga Provincial Park (MPP) in Georgian Bay, Ontario, which provides boating and camping opportunities on remote islands only accessible by air or water. The purpose of our project is to determine if human recreation is having an effect on turtle populations in The MPP. The project will have two components: a study of the population ecology of all turtle species in the park, and an analysis of the spatial behaviour of Stinkpot Turtles (*Sternotherus odoratus*). Data will be collected from three replicates of each of two site treatments: impacted bays (high activity) and non-impacted bays (low activity). Mark-recapture and visual surveys will be used to determine the abundance, biodiversity and sex ratios of turtle populations. Radio telemetry and a Geographic Information System (GIS) will be used to estimate home range sizes and average daily movements of Stinkpots in impacted and non-impacted sites. Demographic and spatial data will be compared between site treatments. We predict that if human recreation is negatively affecting turtles, then abundance and biodiversity will be lower in impacted sites compared to non-impacted sites, and that Stinkpot home range sizes and movements will be greater in impacted areas as turtles try to avoid people. Information gathered will assist in park management planning and increase knowledge of the impact of water-based recreational activities on turtles.

PLATFORM

CONFERENCE ABSTRACTS 2009

LEFEBVRE

SLITHER UNDER ROOF: USE OF ARTIFICIAL COVER TO SURVEY A CRYPTIC SNAKE SPECIES, THE NORTHERN RIBBONSNAKE (*THAMNOPHIS SAURITUS SEPTENTRIONALIS*)

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The Northern Ribbonsnake population of Nova Scotia is disjunct from the continental population. This population is particularly vulnerable due to its small size (1,000 - 3,000 individuals) and its isolation. The Northern Ribbonsnake was listed as Threatened in 2002 by COSEWIC, the main reason being lack of knowledge about the species. The Northern Ribbonsnake is a cryptic species because of its semi-aquatic lifestyle, which makes it difficult to find in its natural habitat. The use of artificial cover is a tried and tested method to survey for terrestrial snakes, but has not been tested for semi-aquatic species. An experiment was designed to test the viability of this method to survey Northern Ribbonsnakes, in hopes to reduce the effort in person-hours for distribution surveys. Four sites of known occurrence were chosen in southwest Nova Scotia; Grafton Lake, McGowan Lake, Molega Lake and Barren Meadow. At each site, four types of artificial covers (roof shingles, corrugated metal, cloth tarp and press wood) were randomly selected and placed in transects in three types of habitat; water's edge, open meadow and forest edge. All the artificial covers types were the same size. The results will be analyzed to determine if artificial covers are effective as tools for surveys, and which type of artificial cover and habitat should be selected if the method is successful. We will also examine if artificial covers are used more during a period of the active season and/or a period of the day.

PLATFORM

CONFERENCE ABSTRACTS 2009

LEUNG

INVESTIGATING THE PHYLOGEOGRAPHY OF THE GREATER SHORT-HORNED LIZARD (*PHRYNOSOMA HERNANDESI*) IN ALBERTA

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The Endangered Greater Short-horned Lizard is the only saurian native to Alberta. Former studies of this species in Alberta have revealed significant information about its general biology and geographic distribution. Across southeastern Alberta, its geographic distribution is patchy and centres upon four main clusters with apparent gaps between them — South Saskatchewan River; Manyberries; Chin Coulee and along the Milk River. Furthermore, the total Albertan population is thought to be rather sparse, with an upper estimate of 16,379 individuals (COSEWIC report, 2007). We know little about historical patterns of colonization, or the effects of current land usage patterns on the population structure of these lizards. Mapping the inferred population movement patterns of this taxon over the landscape in relation to the retreat of the ice-sheet 10kYA, and during the dry xerothermic period (6kYA-4kYA), may help to explain current distribution patterns in Alberta. Furthermore, exploring the potential effects of recent anthropogenic activity (oil and gas drilling and irrigation practices) may also help shed light on their role in shaping current distribution and patterns of habitat occupancy. We are employing sequenced molecular markers (mitochondrial, nuclear and microsatellite) extracted from horned-lizard tail-tips to (1) investigate the route(s) by which horned lizards (re)-colonized Alberta following the retreat of the Laurentide ice-sheet some 10kYA, and (2) explore the effects of landscape-scale habitat alteration on the potential connectivity between and within population clusters of the Short-horned Lizard. Potential problems of sample size will be addressed. Our findings should contribute to enhancing management strategies of this locally Endangered species.

PLATFORM

CONFERENCE ABSTRACTS 2009

LITZGUS

FRESHWATER TURTLE SURVIVAL STRATEGIES UNDER ICE

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Turtles at northern latitudes spend over half their lives in hibernation and can employ two strategies to tolerate the long winter season without access to aerial oxygen: anoxia tolerance or anoxia intolerance. Although lab studies have provided information on survival by turtles when submerged at cold temperatures, only recently have field studies started to examine this aspect of the annual cycle of turtles. The purpose of our study was to compare the overwintering ecology and site selection among three turtle species to allow inference about physiological adaptations. We synthesized data from three radio telemetry studies in Ontario to look for species-specific characters and general patterns. Spotted Turtles (*Clemmys guttata*) in Georgian Bay used defined structures in sphagnum swamps with little dissolved oxygen, showed fidelity to sites, and hibernated communally. Similarly, Blanding's Turtles (*Emydoidea blandingii*) in Algonquin Park used wetlands with low dissolved oxygen, chose sites that were colder than random sites, and showed site fidelity. Selecting sites with low temperatures minimizes metabolic acidosis caused by low oxygen levels since oxygen demands can be met cutaneously. In contrast, Wood Turtles (*Glyptemys insculpta*) in Sudbury did not show site fidelity, overwintered in a flowing river that provided high dissolved oxygen, and winter movements were not related to temperature or oxygen levels. All three species used sites that were ice and snow-covered for several months and that maintained stable body temperature just above freezing. Given that most turtles in Ontario are considered to be at risk, hibernation ecology data are important for defining critical habitat.

PLATFORM

CONFERENCE ABSTRACTS 2009

LONG

THERE'S NO PLACE LIKE HOME: REFUGE MICROSITE CHARACTERISTIC SELECTION EXHIBITED BY BOREAL TOADS (*ANAXYRUS BOREAS BOREAS*)

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Adult Boreal Toads (*Anaxyrus boreas boreas*) exhibit non-random movement patterns consisting of bursts in which they travel great distances over short periods of time, followed by extended periods of rest. During these rest periods, animals establish themselves in one or a few nearby refuge microsites (often under 1 m² in size). Animals display a high degree of fidelity towards their refuges and can be found in them repeatedly during their stay within a given area. It is believed that refuge microsites represent a critical resource for Boreal Toad persistence in an area. What sets these microsites apart from the surrounding habitat is unknown. We conducted a pilot study in 2008 in the boreal forest of Alberta to compare vegetation community composition between refuges. Preliminary analyses indicate that there were no similarities between vegetation communities across refuges. Instead, the animals appear to use complex arrays of coarse woody debris (CWD). An ongoing follow up study employs radio telemetry to identify refuges, using the animals as vectors. Vegetation community, substrate, CWD and microclimate characteristics are being compared between refuge, near-refuge and reference plots. It is expected that the physical structure of the microsite is being selected by Boreal Toads, rather than 'habitat' in the traditional sense. Such finer-scale habitat information is necessary to guide conservation efforts, potentially leading to the creation of critical Boreal Toad habitat following anthropogenic disturbances such as timber harvest.

PLATFORM

CONFERENCE ABSTRACTS 2009

MARTINO

HABITAT SELECTION OF THE EASTERN YELLOW-BELLIED RACER (*COLUBER CONSTRICTOR*) AND BULLSNAKE (*PITUOPHIS CATENIFER*) IN SOUTHERN SASKATCHEWAN

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Understanding the habitat requirements of a species is vital for developing an effective recovery or management strategy. The Eastern Yellow-bellied Racer (*Coluber constrictor*) is a Threatened species in Canada, primarily because its range is restricted to a small area around Grasslands National Park in southern Saskatchewan. There have been no studies published on the ecology of this species in the Canadian prairies, and thus there is little detailed information from which to draft a recovery strategy. The Bullsnake (*Pituophis catenifer*) shares habitat and hibernacula with the Racer. The geographic range of the Bullsnake is larger than that of the Racer but again no ecological studies have been published on this species in Canada and as a consequence, its conservation status is designated as "Data Deficient". We employed radio telemetry to begin identifying important ecological parameters of these two snake species, including habitat selection, movement patterns and den locations. Over two years we tracked 20 Racers and 16 Bullsnares from five den sites in the Grasslands National Park area. We measured a wide range of habitat features selected by snakes (percent vegetation, maximum vegetation height, distance to nearest burrow, etc.) and these measures will be incorporated into a multivariate habitat selection model. There appears to be a general trend of Racers spending their summer in proximity to the Frenchman River as opposed to inhabiting the upland pasture areas. Bullsnares showed a similar trend, spending time along waterways, but also seemed to prefer habitat in roadside ditches. All snakes avoided Black-tailed Prairie Dog colonies. When completed, the results of this project will be used to inform recovery strategies and help identify critical habitat for these species.

POSTER

CONFERENCE ABSTRACTS 2009

MARTINSON

MODELING ROAD MORTALITY OF PRAIRIE RATTLESNAKES AND BULLSNAKES IN ALBERTA

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The grasslands of the Northern Great Plains have experienced significant change, first from crop agriculture during the settlement period, then with elaboration of the transportation network, and in recent decades for hydrocarbon extraction. Roads with vehicles can have significant ecological effects including wildlife road mortality. Road density and vehicle access pose unquantified threats to snake populations in Alberta's Mixedgrass Natural Subregion, where development has been accompanied by increased road density and vehicular traffic. We studied the movement behaviour of Prairie Rattlesnakes (*Crotalus v. viridis*) and Bullsnares (*Pituophis catenifer sayi*) and developed models of their risk of road mortality. We found that temperature was a good predictor of snake movement and influenced road mortality rate. Traffic density also significantly influenced the number of snakes killed on roads. Additional factors that influence mortality risk were incorporated into a system dynamics model that we used to evaluate the sensitivity of parameter value changes. Model results indicated that road density and traffic density were the most influential factors for snake road mortality risk, vehicle speed had a moderate effect, and the influence of driver awareness was negligible. We propose that wildlife managers can use these models as planning tools for mitigating the impacts of road mortality on Prairie Rattlesnake and Bullsnake populations.

POSTER

CONFERENCE ABSTRACTS 2009

McFADDEN

COMPARISON OF TECHNIQUES FOR DEFINING THE CRITICAL HABITAT OF THE NORTHERN PRAIRIE SKINK (*EUMECES SEPTENTRIONALIS*)

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The Northern Prairie Skink (*Eumeces septentrionalis*) is found within a 1,770 km² range in southern Manitoba, confined to sandy soils and open grassland prairie. This population is isolated from its contiguous population range that extends north into North Dakota and Minnesota and to the south into Kansas. The size of this home range within Manitoba has been declining in recent years and is of increasing conservation concern. This decline has been due to various causes, which include the loss of open grassland prairie to aspen succession caused by fire suppression programs, exotic leafy spurge infestation, urbanization, road construction and land lost to agriculture for potato farming. In order to facilitate improvements in the Northern Prairie Skinks' habitat, suitable habitat (or "proposed critical habitat") must first be established. This is possible through use of aerial orthophotos, ground truthing, or using unmanned aerial vehicles to collect photos, and creating polygons within a mapping program to determine the size of suitable skink habitat at known capture locations. These methods were employed in the study, allowing comparisons to be done between the different techniques and determine the merits of each in their ability to accurately determine the Northern Prairie Skinks' "proposed critical habitat."

PLATFORM

CONFERENCE ABSTRACTS 2009

OKONKWO

THE USE OF SMALL EPHEMERAL WETLANDS BY AMPHIBIANS IN THE MIXEDWOOD FOREST OF BOREAL ALBERTA

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Amphibians are currently experiencing a population decline due to several factors including habitat loss. Identifying what constitutes amphibian habitat in the mixedwood forest landscape will provide a critical tool for managing populations. Most conservation plans for amphibians ignore small ephemeral watersheds because of their size and temporary nature. Furthermore, there have been limited studies on amphibian use of these habitats. We carried out a study to identify if and how amphibians use small ephemeral wetlands (< 0.1ha) on land leased by Daishowa Marubeni International Ltd. within the Peace River Forest Management Area of northwestern Alberta. Twenty-seven small ephemeral wetlands (< 0.1ha) were sampled every two weeks using time-constrained visual encounter surveys for all life stages of amphibians, from May to August, 2008. During each survey, water depth, hydroperiod, temperature, pH and canopy cover of the ponds were also measured. Amphibians were observed at the water surface, pond bottom, under submerged debris, shoreline and riparian areas. A total of 1,105 amphibians including *Lithobates sylvaticus* (*Rana sylvatica*), *Anaxyrus boreas* (*Bufo boreas*) and *Pseudacris maculata* were captured in 19 wetlands. Breeding was observed with egg masses and tadpoles occurring in 14 wetlands. Over 68% of the animals found were young-of-the-year. Wetlands with amphibians were characterised by < 40% canopy cover, while > 60% canopy cover was observed at wetlands without amphibians. Temperature and pH were significantly higher in wetlands with amphibians present. Regression analysis indicated that pH, canopy cover, temperature and hydroperiod significantly influenced amphibian presence and breeding at these wetlands. Our study demonstrates that amphibians use small ephemeral wetlands at different stages of their life cycles. The value of these wetlands should not be under-estimated because of their small size, and the absence of water at the time of operational planning. Based on the use of these habitats by amphibians documented by our study, incorporating small wetlands into forestry and conservation plans will contribute to the preservation of amphibian populations.

PLATFORM AND POSTER

CONFERENCE ABSTRACTS 2009

PAGNUCCO

CONSERVING LONG-TOED SALAMANDERS (*AMBYSTOMA MACRODACTYLUM*) USING UNDER-ROAD TUNNELS IN WATERTON LAKES NATIONAL PARK

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Urbanization and the construction of roads result in habitat fragmentation, which can affect the size, health and persistence of animal populations. Corridors are an essential feature of natural reserves because they connect otherwise isolated areas of suitable habitat. Amphibians require both aquatic and terrestrial habitats connected by suitable corridors to complete their life cycles. Linnet Lake in Waterton Lakes National Park (WLNP) once supported a large population of Long-toed Salamanders (*Ambystoma macrodactylum*; a “Species of Special Concern” in Alberta) that has undergone recent declines. In 1994, at least 10% of Long-toed Salamanders that attempted to cross the Park Entrance Road (which runs parallel to Linnet Lake) were killed by vehicles, and up to 44% were killed during more recent counts. In 2008, four tunnels—the first in a Canadian National Park—were installed by Parks Canada under the Entrance Road to aid salamander movement between habitats. The main objective of our study is to determine the suitability of under-road tunnels as a means of conserving a Long-toed Salamander population threatened by the effects of roads. In 2009, salamanders were guided towards tunnel entrances using directional drift fences. We marked and measured amphibians caught along drift fences nightly throughout the migration period to gather population demographic information, as well as to develop a population estimate. Tunnel use was monitored using cameras and pitfall traps at all eight entrances. Radio telemetry and drift fences were used to determine Long-toed Salamander movement patterns and habitat use. By characterizing terrestrial habitat use by Long-toed Salamanders as a model species, we hope to define the landscape conditions needed to sustain amphibian and reptile populations in the Canadian Rockies, and to use this knowledge to influence decisions on future road construction and creation of corridors to link critical habitat features.

PLATFORM

CONFERENCE ABSTRACTS 2009

PATERSON

ASSESSING THE USE OF ARTIFICIAL NESTING SITES AS A CONSERVATION TOOL FOR TURTLES IN ALGONQUIN PARK, ONTARIO

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Adult mortality from roads is one of the main threats to turtle populations in Ontario. Most often, it is reproductive females that are killed on roads during movements to nesting habitats. This is especially deleterious because adult females are the most critical individuals for population viability. In order to reduce adult female mortality and to improve recruitment of juveniles, the use of artificial nest sites has been suggested as a conservation tool. The goal of this study is to evaluate the use of artificial nesting sites in reducing adult female mortality and increasing recruitment for turtle Species at Risk in Algonquin Park, Ontario. The area has four species of turtles, three of which are listed by COSEWIC as Species at Risk. Previously known natural nesting sites and four artificial nesting sites were monitored during June 2009. Females were processed and identified using individual notch codes. Nests were excavated, eggs measured, and caged with hardware cloth to obtain hatching success rates in the absence of predation. Habitat characters such as distance to water, vegetation cover, incubation temperatures and substrate type were recorded to determine differences between natural and artificial sites. Preliminary data from a first field season will be presented comparing nests both on and off the artificial nest sites. These results will be important for the implementation of artificial nesting in other areas where road mortality poses a significant risk to adult female turtles.

PLATFORM

CONFERENCE ABSTRACTS 2009

PAULI

THE TERRESTRIAL WETLAND GLOBAL CHANGE RESEARCH NETWORK (TWGCRN)

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The TWGCRN is a growing network of U.S. and Canadian organizations, scientists, and research sites dedicated to addressing two overarching questions: 1) How will climate/global change affect critical ecosystem services provided by interconnected wetlands and uplands across a vital portion of the North American landscape? and 2) What can resource managers do to mitigate negative impacts on these services? We are using various approaches including surveys, monitoring, experiments, and modeling and standardized methods to measure key biotic and abiotic responses to climate/global change that will enable us to address these questions across space and time. Our integrated approach also involves coupling of data collected via satellites with data collected on the ground at intensive study sites. We use satellite data to assess landscape-level conditions, such as snow cover, vegetation green-up and structure, the extent of surface water, and effective habitat connectivity over time. We use ground data to describe conditions at individual wetlands, such as amphibian and bird calling phenology and occupancy, air and water temperatures, and water quantity and quality. Measuring these different, but related, variables will enable us to provide valuable information on how changes in climate and land use are associated directly and indirectly with changes in vegetation, hydrology, and biological communities at the landscape level and the ecosystem services they provide.

PLATFORM

CONFERENCE ABSTRACTS 2009

PROUTEN

IDENTIFICATION AND ASSESSMENT FOR THE NOMINATION OF POSSIBLE IMPARA SITES IN MANITOBA, CANADA

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Canada is home to 49 amphibians and 54 reptile species (CARCNET), many of whose numbers are declining due to various factors such as the loss of important habitat for the various life stages of these organisms. Manitoba is home to several species that are either endemic or considered Species at Risk. These species are found throughout Manitoba; three areas in particular are important for the survival and persistence of a variety of reptile and amphibian species. The Narcisse Wildlife Management Area is vital to the survival of the Prairie population of Northern Leopard Frogs, which are of Special Concern, and the Red-sided Garter Snake. Though the Red-sided Garter Snake is not a Species at Risk, this area holds an exceptionally large proportion of Manitoba's population. They require the area for migration to and from wintering hibernacula as well as for breeding and feeding sites during the summer. The second area is Spruce Woods Provincial Park (SWPP). SWPP has a varied landscape which includes the very rare Spirit Sands. There are few places in Canada and nowhere else in Manitoba with such large stretches of open sand (Manitoba Conservation). This area is home to the endemic Northern Prairie Skink and the Western Hognose Snake. The third location is the area surrounding the town of Saint-Léon. This area is rich in wetlands, and as such has a large proportion of the Prairie/Boreal subspecies of Gray Tiger Salamanders. The three areas that were chosen for these nominations were based on geographic distribution, habitat type and species composition. With a preference for areas that contain Species at Risk, the overall goal of this project is to document and bring recognition to areas that are vital to the continued survival of Canada's amphibians and reptiles.

POSTER

CONFERENCE ABSTRACTS 2009

RASMUSSEN

SITE FIDELITY, INDIVIDUALITY AND SCALE OF HABITAT SELECTION MAY COMPLICATE THE DESIGNATION OF SPOTTED TURTLE HABITAT IN ONTARIO

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Designation of habitat for Species at Risk is an important step in the conservation of populations. This is especially true for species such as turtles whose extreme life histories do not allow them to respond quickly to recovery efforts. The Spotted Turtle (*Clemmys guttata*) is listed as Endangered in Canada. Spotted Turtles appear to be habitat generalists across their range, but specialists within each population. These factors complicate the creation of basic habitat assessment and protection guidelines, even over relatively small geographical areas. This study documents habitat selection and use of overwintering and nesting sites in a large population of Spotted Turtles on Lake Huron, Ontario. Individual turtles (N = 15) were located regularly from April 2007 until April 2009 using radio telemetry. Based on multi-scale compositional analyses, individuals selected habitats for their home range and within the home range, and the ranking of preferred habitat types depended on the scale of study. Seasonal shifts in habitat selection were observed. Despite shifting macrohabitat types, microhabitat use did not vary by season. Females were more likely to choose areas with more available cover from June - August compared to males. Nesting sites were variable, and females showed fidelity to substrate type rather than a specific location. Overwintering site choice was also variable, and most individuals showed high fidelity to an overwintering location. Up to 16 individuals were found within one overwintering site. Based on the results of this study, we suggest that microhabitat characteristics should be the focus when describing Spotted Turtle habitat. The variability and individuality apparent in habitat selection (especially nesting and overwintering sites) complicates the designation of Spotted Turtle habitat in populations that have not been intensively studied.

PLATFORM

CONFERENCE ABSTRACTS 2009

TINGLEY

THE FROG FILTER: AMPHIBIAN INTRODUCTION BIAS DRIVEN BY TAXONOMY, BODY SIZE AND BIOGEOGRAPHY

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Species introductions are a major ongoing threat to global biodiversity, and prevention of such introductions is the best way to reduce future damage. Importantly, established species often exhibit a highly non-random suite of traits relative to non-established taxa, and these biases reflect strong selection at a series of steps along the invasion pathway. Here we investigate traits that are favoured in the first of these steps: the transportation of species outside of their native geographic range. We use the global introduction of amphibians as our case study. Many species of amphibians have been introduced to places far outside their natural geographic ranges; some of these species have flourished, and have gone on to have severe ecological impacts on native fauna. Do taxonomy, body size and biogeography predict the likelihood of an introduction event in amphibians? Comparisons of introduced and non-introduced amphibians reveal significant biases with respect to taxonomic position (some groups are more likely to have been introduced than others) and attributes of the native geographic range (most introduced species are northern-hemisphere in origin, occupy a wide geographic range, and are sympatric with high densities of humans). These biases presumably reflect the ease of capturing and transporting such animals. Additionally, intentionally introduced species average larger in body size than do unintentionally introduced species (i.e., stowaways). Interestingly, many of these patterns are similar to those revealed by previous analyses of avian introductions, suggesting possible generalities in the anthropogenic biases involved in transporting species around the globe.

PLATFORM

CONFERENCE ABSTRACTS 2009

WHITE

ABUNDANCE AND DISTRIBUTION OF NORTHERN LEOPARD FROGS (*LITHOBATES PIFIENS*) ALONG THE UPPER QU'APPELLE RIVER

Corie White¹, Heather Davies² and Glen McMaster¹ (Authors not in attendance. Presented by Andy Didiuk)

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The abundance and distribution of Northern Leopard Frogs (Species of Special Concern) along the Upper Qu'Appelle River from the Qu'Appelle Dam to Eyebrow Marsh was determined using mark-recapture methods during fall (2007, 2008) and subsequent spring (2008, 2009) sampling. In total, 1,043 frogs were captured and uniquely marked. Using Program MARK the fall abundance for surveyed sites was estimated to be 3,733 ($\pm 1,667$ SE, $n = 13$ sites) and 3,434 ($\pm 1,783$ SE, $n = 9$ sites) frogs for 2007 and 2008, respectively. When extrapolated to the entire system (35 km) the fall abundance for 2007 and 2008 was estimated to be 19,722 ($\pm 8,650$ SE) and 26,708 ($\pm 12,965$ SE). Spring abundance estimates could not be determined due to low recapture rates. The number of individuals detected varied between sites; however, the abundance was not related to the land cover type at 0.5 km, 1 km and 2 km radius from the transects. Two individuals marked in the fall were recaptured during the subsequent spring surveys. The fall population was composed primarily of young of the year (83% in 2007 and 94% in 2008). Conversely, adults accounted for 65% of the population in spring 2008 and 69% in spring 2009. The number of individuals detected in the fall was greater than the number detected in the subsequent spring, with the number of young of the year/juveniles accounting for 70% of the recorded decline between seasons. The low overwinter recapture rates and the reduction of juveniles in the spring suggests low overwinter survival for young of the year. Further, the small movements recorded (≤ 300 m) and evidence of breeding at localized wetlands (≤ 200 m from the channel) suggests a localized overwintering and breeding population along the Upper Qu'Appelle River.

POSTER

CONFERENCE ABSTRACTS 2009

WHITING

USING STABLE ISOTOPES TO EXPLORE THE ECOLOGY AND FUNCTIONAL ROLE OF TADPOLES

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A decade ago Petranka and Kennedy (1999) called for a re-evaluation and further study of the functional role and trophic position of tadpoles. Tadpole digestive efficiency appears to be low, as much of the ingested material passes through the gut unchanged. Due to differences between ingestion and assimilation, tadpole diets remain poorly understood. Gut contents provide snapshots of the diet, whereas stable isotopes of nitrogen and carbon integrate dietary components over a much longer time. A clearer understanding of tadpole diets, and tadpole functional roles (herbivore, carnivore or omnivore) and their trophic position within aquatic food webs are essential to understanding the ecology of tadpoles. Our goals were to use stable isotopes to identify the functional roles of Boreal Chorus Frogs and Wood Frogs in temporary ponds, identify the relative trophic positions of these species within ponds in different landscapes (agriculture and protected natural areas), and explore interspecific interactions between tadpole species. We sampled six ponds within Elk Island National Park, Alberta and eight ponds in the surrounding agricultural areas. The potential food of tadpoles was unclear from isotopic signals but in general, tadpole trophic position suggested they were omnivores compared to purely herbivorous snails present at each location. Herbivory in tadpoles increased in ponds with greater phosphorous concentrations. The functional role of tadpoles varied among agricultural ponds depending on upland activities with tadpoles becoming more carnivorous in pasture ponds. The isotopic signals of tadpoles suggested that interspecific resource overlap may occur at some locations, but this overlap did not result in differences in growth of Boreal Chorus Frogs across ponds. In addition to food web structure, we collected an ontogenetic series of samples from eggs through to metamorphosis to adults for both Boreal Chorus and Wood frogs. Isotopic signals distinguished animals consuming terrestrial versus aquatic diets. Understanding the feeding ecology of tadpoles may help predict how alterations to aquatic food webs either through changes to surrounding land use or climate change might influence tadpole survival and ultimately population persistence.

PLATFORM

CONFERENCE ABSTRACTS 2009

YAGI

THE EFFECT OF FLOODING ON THE SPATIAL ECOLOGY AND THERMOREGULATION OF SPOTTED TURTLES (*CLEMMYS GUTTATA*) IN A SOUTHERN ONTARIO POPULATION

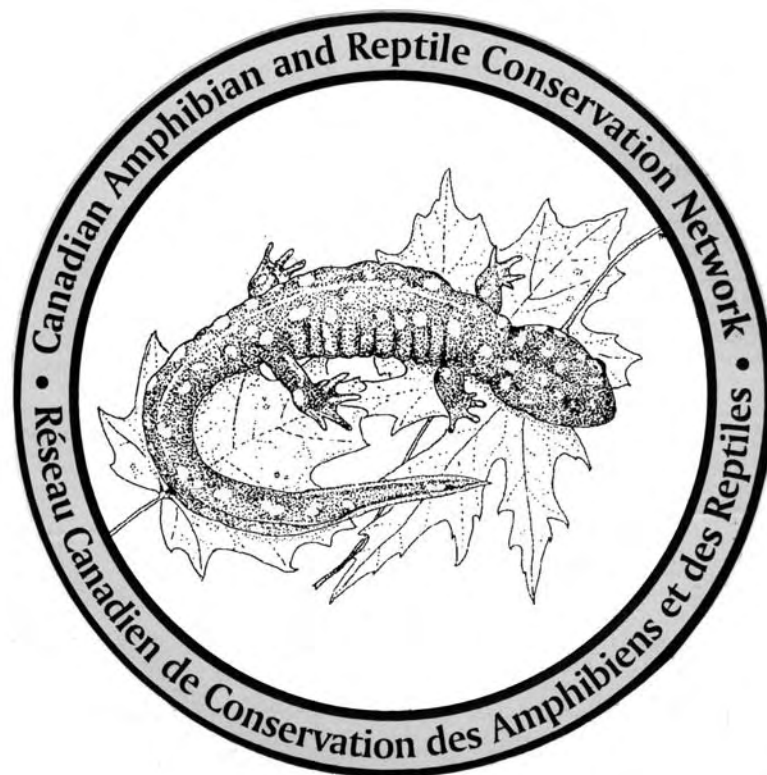
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Ectotherms have evolved behavioural and thermoregulatory mechanisms to adjust body temperatures to minimize energetic costs. Assessing habitat selection is important for describing thermoregulatory behaviour since ectotherms choose habitats based on their thermoregulatory needs. One such behaviour is aestivation; a summer dormancy that includes inactivity, fasting and physiological adjustments to protect against water loss. The purpose of this project is to determine the effect of changing habitat (i.e., flooding) on the spatial ecology and thermoregulation of Spotted Turtles (*Clemmys guttata*), specifically looking at aestivation. Spotted Turtles from a population in southern Ontario will be radio tracked, and body temperatures (T_b) and environmental temperatures (T_e) recorded. To examine the relationship between thermoregulation and habitat selection, artificial turtle models outfitted with temperature loggers will be placed throughout the available habitat. Temperatures chosen by turtles will be compared to those available to determine if habitat selection is related to thermal properties. Spotted Turtle preferred body temperature (T_{set}) will be determined by observing active individuals in a thermal gradient. We will examine whether turtles in nature choose habitats based on thermal properties that allow them to maximize time spent at T_{set} . Spatial ecology will be compared before and after the habitat change using historical radio telemetry data collected by the Ministry of Natural Resources and data collected during the current study. Understanding the response of a Species at Risk, such as the Spotted Turtle, to a rapid change in habitat will help biologists determine the best long-term course of action to take to maintain populations.

PLATFORM

CONFERENCE ABSTRACTS 2009



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