

THE YUKON BIODIVERSITY WORKING GROUP
2019 ANNUAL FORUM



Photo Credit: Sonny Parker Photography

PROGRAM AND ABSTRACTS

*The 2019 Annual Forum is coordinated by:
Yukon Research Centre (Yukon College)
Yukon Conservation Data Centre (Government of Yukon)*



THE YUKON BIODIVERSITY WORKING GROUP 2019 ANNUAL FORUM

OUR VISION AND PURPOSE

The Biodiversity Working Group is a non-government open-membership group of those involved in ongoing biodiversity assessment and monitoring projects throughout the Yukon. It is hosted through the Yukon Research Centre at Yukon College and meets informally during winter months. The vision is in four basic parts: a) To foster partnerships and networking, -- including coordinated contribution to national and local initiatives relative to the Canadian Biodiversity Strategy; b) to deliver public education on biodiversity issues; c) to provide coordination among field researchers promoting long term data bases on key focal species; d) to integrate local traditional knowledge into on-going field data gathering processes.

THE FORUM

The Forum is designed as a single-day annual event, held this year March 2nd from approximately 9AM to 4PM. The purpose is to give an opportunity for a broad cross section of exposure to current field projects that relate to biodiversity assessment and monitoring in the Yukon. Posters, coffee and lunch breaks are normally provided. A day for community members and researchers to share information and foster partnerships, learn about Yukon plants, animals and special habitats as well as to identify knowledge gaps and species or habitats that need monitoring.

REGISTRATION

The sessions are open to all with an interest in Yukon biodiversity, its assessment, monitoring and conservation. There is no registration fee. We provide name tags and would like to keep a registry of all those attending.

ORGANIZING COMMITTEE

Dave Mossop
Bruce Bennett
Jessica Norris
Dennison Bohmer

ABSTRACTS

2019 YUKON BIODIVERSITY FORUM

Dave Mossop

Yukon Research Centre and Yukon College

Title: Are American Kestrels in Yukon (Canada) showing signs of being in “Predator Pit”?

The American kestrel (*Falco sparverius*) population status in the Yukon, Canada, has been tracked since the mid 1980’s using a territory-wide nest box array of about 150 boxes. Starting rather abruptly in the early 1990’s, the study group has collapsed. In 2007 the study group fell to zero, then has struggled along at between 1 and 8 pairs. Interestingly among this small number of breeding pairs an inordinate proportion are found in later visits to have abandoned clutches of fertile eggs or dead half grown young. One very possible explanation that needs focus is the predation level to which the adults are being subjected. Peregrine falcon, that have recovered to relatively high numbers in the territory are well documented as predators of kestrels. While the ultimate issues facing kestrels are likely content-wide, the idea of predation holding this very small population down at the far northern limit of its range, would fulfill the theory of ‘small population vortex’ nicely.

Thomas S. Jung*, Shannon A. Stotyn, and Nicholas C. Larter

Department of Environment, Government of Yukon, Whitehorse, Yukon, Canada (TSJ); Department of Renewable Resources, University of Alberta, Edmonton, Alberta, Canada (TSJ); Canadian Wildlife Service, Environment and Climate Change Canada, Whitehorse, Yukon, Canada (SAS); Department of Environment and Natural Resources, Government of the Northwest Territories, Fort Simpson, Northwest Territories, Canada (NCL)

Title: Freezer meals: comparative value of muskrat (*Ondatra zibethicus*) push-ups as late-winter forage for a northern ungulate

One of the more unique aspects of the natural history of muskrats (*Ondatra zibethicus*) is that during early winter they construct push-ups—piles of frozen vegetation—on the surface of frozen lakes. Push-ups are a potentially valuable source of relatively high quality forage for northern ungulates, which typically become increasingly nutritionally deprived during winter. Because of concerns by local First Nations that bison (*Bison bison*) were eating muskrat push-ups and causing local declines in their population, we assessed the comparative value of push-ups as late-winter forage for bison. We collected vegetation from 18 push-ups and 18 shoreline (wet sedge meadows) sites, distributed equally from 3 lakes, and used wet chemistry techniques to assess their nutritional quality (i.e., percent crude protein, neutral detergent fibre, lignin, and total digestible nutrients, plus major and trace minerals). General linear models revealed that most variables assessed differed significantly by SITE (push-up versus shoreline; 13 of 15 variables), LAKE (3 lakes; 9 of 15), and their interaction (SITE*LAKE; 11 of 15). Our data suggest that muskrat push-ups may provide a supplement to winter forage used by bison by helping to boost protein intake as well as providing minerals that may be deficient in their late-winter diets, such as Ca, Fe, and Cu. As such, bison should seek push-ups in late winter to supplement their diet and improve their nutritional condition at a time when they are seasonally impoverished. Our study also demonstrates that nutritional quality of push-ups varies significantly between nearby lakes—likely due to their unique biogeochemistry. As such, muskrat push-ups on some lakes may be more favoured by bison than those on other lakes.

Pam Sinclair*, Marty Mossop, Shannon Stotyn

Canadian Wildlife Service

Title: Life in the riverbank: nesting ecology of Bank Swallow *Riparia riparia* in southern Yukon

The Bank Swallow *Riparia riparia* is listed as Threatened in Canada due to population declines, but little is known of its status in the north. We investigated the nesting ecology of this species in the Whitehorse area by monitoring 74 colonies along 46 km of the Yukon River (2013-2016) and five colonies in road cut-banks (2013-2017). Nesting abundance on the Yukon River, as measured by burrow counts (326 burrows/km), was high compared to other regions of high abundance in North America although percent occupancy of burrows appeared lower. Burrows persisted over the winter more than in other regions, with 95% of colonies persisting for the duration of the study and 24% percent of individually-tracked burrows present in 2013 persisting into the 2017 season. All cut-bank colonies and 69% of river colonies were occupied by Bank Swallows in at least one year during the study. These colonies were active on average 2.8 ± 1.2 of 4 years monitored (river colonies), and 4.2 ± 0.8 of 5 years (road-cut colonies). Within colonies, the percent of burrows occupied was higher in river colonies than cut-bank colonies. Of burrows containing active nests, 55% were newly-excavated by the birds that year, while 32% had been occupied the previous year and 13% had been present but unoccupied the previous year. More study is needed to determine distribution, population status, importance of natural vs. artificial habitats, and effects of climate change on this species in the north.

Dawn Hansen

Tr'ondëk Hwëch'in and EDI Environmental Dynamics Inc

Title: Stock Restoration Planning and Klondike River Chinook In-Stream Incubation Trial

Community concerns about the decreasing numbers of Chinook salmon returning to the Dawson Area and the Klondike River have raised a number of questions. With guidance from the Tr'ondëk Hwëch'in stock restoration plan for the Klondike River, the community is undertaking a number of projects to assess Chinook salmon spawning habitat and ways to increase the number of Chinook returning to the Klondike River. Teaming up with EDI, Tr'ondëk Hwëch'in has started an in-stream incubation trial to determine habitat suitability, juvenile development rates and alternate ways to increase salmon numbers. A large portion of this project is to encourage community participation in learning about the salmon life cycle and challenges for salmon at different life stages

Jill Johnstone

Northern Plant Ecology Lab

Title: Resilience of black spruce forests to fire in the northwest boreal region

This talk will summarize recent work in Alaska, Yukon, NWT, and Saskatchewan examining the resilience of black spruce forests to fire under changing climate and fire conditions. Research on spruce forests in the Yukon has demonstrated the potential for closely timed fires (reburns) to disrupt stable patterns of black spruce regeneration. Similarly, work on large fires in Alaska indicates that patches of black spruce forest that burn with high severity, losing much of their accumulated organic layer, are likely to shift to increased dominance of deciduous trees like birch and aspen. Measurements of post-fire recovery across a range of forest types in Saskatchewan and NWT further suggest that black spruce forests may be particularly vulnerable to regeneration failures or shifts to alternate forest types after fire. Such shifts seem most likely in well-drained forests, and may represent an interaction of changing fire conditions with climate warming that could drive a reduction in well-drained black spruce forests within the northwest boreal region.

Jane Harms*, Emily Chenery, Peter Molnar (University of Toronto) Meghan Larivee, Michelle Thompson, Julianna Campbell (Environment Yukon)

Environment Yukon

Title: The Yukon Winter Tick Monitoring Project: Understanding the impacts of climate change on a wildlife parasite

Winter ticks (*Dermacentor albipictus*) are blood-feeding parasites of moose, elk, caribou and deer. Although winter ticks are naturally present throughout North America, they are relatively new to Yukon. Large numbers of ticks can have a negative effect on wildlife health, resulting in hair loss, blood loss, and possibly death of the host. Presently, winter ticks in Yukon are thought to be in low numbers, and no major impacts on moose or other hosts have been reported to date. However, the changing climate is resulting in warmer, wetter conditions with shorter winters in Yukon which could impact winter tick survival and impacts on hosts. This multi-year project will examine the current distribution of ticks in Yukon, determine the potential impact of *D. albipictus* on various cervid hosts, and describe ways in which climate change may alter these interactions in future. The first field season of this project found the presence of larval ticks in the environment for the first time in Yukon, and established a set of wildlife cameras in multiple locations in Yukon to monitor host animal movement and assess winter tick-induced patterns of hair loss. This project relies on collaboration with Yukoners to report hair loss in cervids and provide hides from harvested animals for analysis. Ongoing research will support our understanding of winter ticks in Yukon and will support strategies for future management

Wayne Strong* and Dave Mossop

Yukon Research Centre

Title: The Yukon Research Herbarium Project

Development of a Yukon College herbarium was initiated in the spring of 2018. This project is oriented towards the creation of a research herbarium. The starting collection consisted of 200–250 mounted specimens. Fieldwork in the Swift River to Aishihik area during the summer of 2018 resulted in the collection of 2450 vascular plant, lichen, and bryophyte specimens. An additional 800-mounted specimens were obtained from private donors. By the spring of 2019, the collection will likely exceed 3000-catalogued specimens. The short-term goal of the project is to develop a collection of 10,000+ specimens and an associated digital database by 2022. Longer-term goals include the miniaturization of Cody's *Flora of Yukon* to facilitate its field use, and the development of an online system for plant identification with database information, and specimen photographs and location maps. These latter possibilities are subject to obtaining permission from the copyright holder to use the *Flora of Yukon* for these purposes.

Individuals wishing to contribute existing collections should contact wstrong@yukoncollege.yk.ca to determine their suitability for inclusion. Specimens do not need to be mounted, but must be adequately pressed and preserved. Specimens must also include locations (e.g., UTM or Lat/Long) and collection dates, and should include appropriate site data. Individuals planning to make contributions post-2018 plants should also make contact to ensure that the appropriate information is included for each specimen.

Jonathan Lowey

EDI Environmental Dynamics Inc.

Title: Pine Creek Arctic grayling assessment and habitat improvement

Pine Creek is located to the immediate north-east of the Village of Haines Junction, Yukon. EDI in partnership with the Alsek Renewable Resources Council are conducting habitat enhancement trials for Arctic grayling on Pine Creek. Habitat enhancement structures were constructed during summer 2017 and 2018 to increase habitat complexity, the availability of resting habitat, and habitat cover. The goal of the habitat enhancement trials are to increase the presence of adult Arctic grayling in Pine Creek in order to provide alternative angling opportunities to supplement the recently closed lake trout fishery on Pine Lake. Monitoring during 2019 (and future) years will provide insights on the effectiveness of the habitat enhancement trials. Results can then be used to guide future habitat enhancement projects on Pine Creek and in the surrounding areas.

Bruce Bennett

Yukon Conservation Data Centre, Environment Yukon

Title: Tombstone BioBlitz 2018 Results

A bioblitz is an intense period of biological surveying in an attempt to record all the living species within a designated area. Over 100 scientists, naturalists, and volunteers conducted an intensive field study in Tombstone Park over the Canada Day weekend. With nearly 1000 species recorded (1 in 8 ever reported from Yukon) over the weekend there have been some fascinating discoveries. Learn about new and exciting finds, many new for Canada.

Sonny Parker*, Katie Aitken and Dave Mossop

University of Alberta and Yukon College

Title: Analysis of Long-term Nest Box Use in Southern Yukon: Trends and Relationships Among Secondary Cavity Nesters

Secondary cavity nesting birds and mammals play an important ecological role in the boreal forest. Cavity availability is a limiting factor for many of these species, and hence interspecific competition for viable cavities affects survival and reproduction among secondary cavity nesters. We examined a long-term (2006-2018) nest box data set from the Yukon Territory to identify general trends and interrelationships in nest box use among Mountain Bluebirds (*Sialia currucoides*), Tree Swallows (*Tachycineta bicolor*), Chickadees (*Poecile* spp.), and red squirrels (*Tamiasciurus hudsonicus*). Mountain Bluebird nest box use showed a consistent decline over all years, while other species' nest box use remained relatively stable. Red squirrel nest box use was related to Mountain Bluebird nest box use, but was not related to nest box use in other species. Red squirrels used nest boxes primarily for storage of material and rarely for raising young. Mountain Bluebird nest box use predicted a significant proportion of Tree Swallow nest box use, suggesting higher competitiveness in Mountain Bluebirds. Our results support current evidence of declining Mountain Bluebird populations throughout their breeding range, however, causation is unclear. In contrast, while there is evidence from other studies for Tree Swallow declines throughout Canada, swallow numbers appeared stable in our study location. Climate change and land use practices have the potential to affect both Mountain Bluebird and Tree Swallow phenology, especially in the north. More research is needed to help explain how competitive relationships and population health in northern secondary cavity nesters are changing over time. Continued long-term nest box monitoring projects are an effective and affordable way to examine temporal trends and interactions among these species.

Adil Darvesh

CPAWS

Title: Safeguarding our ecological identity: Why the Yukon needs laws that protect species at risk

The north still has many healthy ecosystems and large areas of relatively undamaged wilderness. With proactive policies, the Yukon can become a model jurisdiction for the protection of species at risk. However, existing laws are current laws are inadequate to protect the Yukon's biodiversity and ecological character. Canada's *Species at Risk Act* fully applies to only 6 percent of the Yukon's land base, while the Yukon *Wildlife Act* applies to just 5 percent of the territory's species. Using existing laws to protect species at risk is like trying to hold out the rain with a fishing net. It's time for the Yukon to take ambitious action to safeguard vulnerable species and the ecosystems they rely on — by enacting standalone species at risk legislation.

CPAWS Yukon identifies gaps in protection for species at risk and offers recommendations for strong legislation in a new report: *Safeguarding our ecological identity*. Effective species at risk legislation it should contain four key principles: the assessment of species by an expert-led advisory body, mandatory legal designation for species at risk, prohibitions against harming species and damaging their habitat, and the rapid implementation of recovery strategies and action plans. Legislation should provide a leading role for Indigenous knowledge in the assessment of species at risk and the crafting of recovery strategies. Indigenous Guardian and community monitoring programs could work on the front lines to track species at risk, implement action plans and enforce legislation. Taking action on species at risk legislation could open an exciting spectrum of new opportunities in conservation, research and Indigenous leadership.

Hilary Cooke* and Lila Tauzer

Wildlife Conservation Society Canada

Title: The migratory spectacle of Yukon's Tintina Trench: a study of spring migration of waterfowl and sandhill cranes.

Yukon's Tintina Trench is frequently described as an important flyway for migratory birds, yet there have been no comprehensive assessments of important stopover sites and habitats. In spring, lakes with open water provide a critical place for waterfowl to rest, recover, and forage in an otherwise inhospitable landscape of snow and ice. In 2016 we initiated a project to identify important stopover lakes for swans, geese, ducks, and other waterbirds in the southeastern part of the flyway. Since then we've surveyed 36 potential stopover locations (includes full-lake surveys on small lakes and multiple locations on large lakes) from 1 to 3 years. Surveys were conducted by helicopter 4 times between mid-April and mid-May. We will report on the lakes that were most heavily and consistently used during this migratory period. In addition, we piloted a study of spring migration of sandhill cranes in 2018. An estimated ¼ million sandhill cranes use the Tintina flyway en route to breed in Alaska and Siberia and we are interested in identifying potential stopover sites. Our 2018 goal was to test Autonomous Recording Units for monitoring cranes. We deployed recording units around the community of Faro, and simultaneously counted cranes passing by. We will share stories, images and video of the 2018 crane migration, and discuss our plans for 2019.

Donald Reid*, Maria Leung, Elise Bolduc, Frank Doyle, Scott Gilbert, Alice Kenney, Charles Krebs, Joël Bêty.

Wildlife Conservation Society

Title: Phenology of hatching and food in low Arctic passerines and shorebirds: is there a mismatch?

The warming climate is driving earlier spring snow melt and longer growing seasons in tundra regions of northwestern North America, thereby changing the timing of ecological processes. On Herschel Island, Yukon, Canada, we investigated the potential for phenological mismatch of egg hatching in migratory birds with the pulses in abundance of arthropod prey on which young birds depend for growth. Tracking hatch dates of passerines and shorebirds along with the changes in biomass of mobile life history stages of arthropods (principally Araneae, Tipulidae, Carabidae, Muscidae, Chironomidae, Mycetophilidae and Ichneumonidae), we found no evidence for phenological mismatch in the 2007-2009 time period. The great majority of nests hatched, and the period of most rapid chick growth occurred, in advance of the highest availability of arthropod biomass. Shorebirds hatched significantly later than passerines, less in advance of the peak abundances of arthropods. They are most at risk of future mismatch, given likely trend to earlier onset of arthropod availability and the birds' long migration routes. Since the 1980s the nesting bird community on eastern Herschel Island has experienced reduction or loss of some species dependent on freshwater ponds or sparsely-vegetated upland tundra. This well studied site warrants further monitoring to assess change.

Al von Finster

Title: Potential River Channel below the Tweedsmuir Glacier: Implications for Pacific Salmon Utilization of the Upper Alsek River Basin

Pacific Salmon are currently obstructed from the upper Alsek Basin by Turnback Canyon in NW BC. The Tweedsmuir Glacier flows into the Alsek River valley from the West and enters at roughly right angles to river flow. Turnback Canyon carries the Alsek past the glacier. The canyon is believed to have formed when the glacier was much more active than at present. Prior to the advance of the Tweedsmuir, the Alsek River may have flowed under what is now the toe of the glacier. The recession of the Tweedsmuir may open this valley, should it exist. If so, and if the channel is accessible to anadromous Coho, Sockeye and Chinook Salmon, these fish are expected to colonize the Upper Alsek Basin. This will include the waters within Kluane Park and to the east of it: the Jarvis River, the Dezadeash River and Lake and the Aishihik River and many of their tributaries. The anadromous salmon populations will have the potential to affect riparian ecosystems, with knock-ons to more upland ecosystems. Preliminary glaciological work on the toe of the Tweedsmuir Glacier is scheduled to occur in 2019. If successful, it may lead to further investigations to determine the existence and characteristics of the land surface below the glacier.

Tara Stehelin* and Fiona Schmiegelow

University of Alberta and Yukon College

Title: Predicting present and future distribution and abundance of Olive-sided Flycatcher (*Contopus cooperi*) and Western Wood-pewee (*C. sordidulus*) in northwestern North America using climate and landcover

Northwestern North America is predicted to have some of the greatest human-caused changes to climate globally, making study of northern-breeding birds imperative to their conservation and management. Long distance migrants and aerial insectivores such as the Olive-sided Flycatcher (*Contopus cooperi*)(OSFL) and the Western Wood-Pewee (*C. sordidulus*) (WEWP) may be impacted disproportionately, due to additional ex situ stressors on their populations such as habitat loss. Examining relative contributions of these stressors is paramount to understanding potential impacts to populations. In northern portions of this region, climate-mediated changes can be examined largely independently of habitat loss. We used 15,637 records of these species from 1049 unique locations sampled between 1992 and 2014 from a comprehensive avian dataset managed by the Boreal Avian Modeling project to generate boosted regression tree models of abundance for these two species of concern. Each bootstrap randomly selected equal abundances and absences stratified by number of observations at each site then built stagewise models using a suite of 37 climate, land-use, topographical and disturbance covariates at a 4 km scale, including species-specific offsets for detectability (and then evaluated using 10-fold cross validation). We also generated models using only climate and landcover layers, one topographical, and one disturbance layer for covariates with climatic conditions from a baseline time period of 1981 – 2010 and two future time periods: 2041-2070 and 2071-2100 under a comparatively high (ensemble projections, RCP8.5) and low (RCP4.5) greenhouse gas emission trajectory. Mean projected outputs revealed high relative abundances in the entire region, but especially in the far northwest and in riparian areas. Total mean abundances were initially high and then either remained the same or declined across scenarios for OSFL, but increased for WEWP, however, the difference in predicted abundance (taking into account probable time lags from vegetation change) between the two time periods was positive for OSFL (as indicated by more gains than losses) and negative for WEWP, underscoring the importance of planning proactively for future species-specific needs. Most gains in distribution were in the northern portion of ranges and most losses were in the southern part of the study area.

Crispin Guppy

Ecofor Consulting Ltd.

Title: Cryptic butterfly species in the arctic-alpine

The "Melissa Arctic" butterfly occurs across temperate and arctic North America and Asia in arctic and alpine rock rubble and tundra habitats. The wing coloration is similar to lichen-covered rocks and tundra, on which they sit when at rest. There are many unrecognized 'cryptic species' within this group of cryptically coloured butterflies, which are being detected through barcode mtDNA analysis and high quality photography of hundreds of museum samples. Museum samples are up to a century old. As an example, Golden Horn Mountain on the edge of Whitehorse has three of these cryptic species flying together - two using alpine rock rubble, and one using tundra.

POSTERS

Nina Vogt

University of Alberta and Yukon College

Title: Effects of permafrost thaw on vegetation and its value to Southern Lakes Caribou habitat in Yukon

Canada's North is deeply impacted by climate change. Changing climates are contributing to landscape change, which raises concerns about sustainability of northern ecosystems that support species habitat. In addition to altering surface topography, the degradation of permafrost causes changes in moisture levels and nutrient availability to plants. This reduces habitat quality for numerous boreal species, many of which are traditionally relied upon as country food. In Yukon, the Southern Lakes Caribou herd experienced historic decline, and since the 1990s, has been the focus of extensive recovery efforts. This herd spans the traditional territories of several Yukon First Nations including: Carcross/Tagish, Kwanlin Dun, the Ta'an Kwach'an Council, Taku River Tlingit, Teslin Tlingit Council, and Champagne and Aishihik, who have been working collaboratively to recover caribou.

The proposed project will identify and characterize key plant and wildlife habitats that overlap with permafrost that is highly vulnerable to thaw, and therefore likely to be impacted by climate change. It will bridge the knowledge gap that exists between understanding changes induced by permafrost thaw and how vegetation and wildlife may react to these changes.

Project objectives are to:

1. Identify the vegetation present in and around permafrost areas that contributes to caribou habitat;
2. Evaluate the relationship between permafrost degradation and vegetation change; and
3. Analyze the potential effects of vegetation change on caribou habitat quality.

Bruce Bennett

Yukon Conservation Data Centre – Environment Yukon

Title: A Snapshot of Yukon Biodiversity – what makes up Yukon's biodiversity by group

The Yukon Conservation Data Centre keeps records over 6700 species which are known to call Yukon home. The biodiversity is broken down by groups. Did you know there are nearly as many flea species as fishes?

Piia M. Kukka, Jeffery R. Werner, Leah M. Andresen, Thomas S. Jung, and Charles J. Krebs.

Department of Environment, Government of Yukon, Whitehorse, Yukon, Canada (PMK, TSJ); Department of Biological Sciences, University of British Columbia, Vancouver, British Columbia Canada (JRW, CJK); Centre for African Conservation Ecology, Nelson Mandela University, Port Elizabeth, Eastern Cape, South Africa (LMA); Department of Renewable Resources, University of Alberta, Edmonton, Alberta, Canada (TSJ)

Title: Landscape drivers of site occupancy by remnant populations of arctic ground squirrels (*Urocitellus parryii*)

Arctic ground squirrels (AGS) occupy alpine and lowland habitats in southwestern Yukon, Canada, where populations have been monitored since the 1970s. While alpine populations have remained stable, populations in low-elevation sites collapsed in the late 1990s and have yet to recover. Propelled by the region-wide collapse of AGS at low-elevation sites, the purpose of our study was to determine covariates associated with occupancy of remnant AGS populations. Using walking transects, we surveyed 155 low-elevation sites in eight study areas for AGS presence, and report a naïve site occupancy rate of 0.628 (SE = 0.040) with a detection probability of 0.884 (SE = 0.026). The presence of conspecifics was the most important covariate explaining AGS occupancy. Importantly, AGS occupancy increased with increasing habitat openness, and was positively influenced by the presence of linear features. Connectivity among colonies and availability of open habitat patches within the boreal forest are likely important factors for the persistence of low-elevation populations, which may be linked to predator avoidance. Shrubification of the boreal forest as a result of climate warming may be reducing AGS ability to avoid predators and persist. Anthropogenic disturbance, such as linear features, may enhance AGS habitat and population connectivity, suggesting that remnant populations in low-elevation habitats at the southern edge of their range are largely persisting in landscapes with a greater human footprint than more natural sites.

Thomas S. Jung, Sean M. Konkolics, Piia M. Kukka, Yasmine N. Majchrzak, Allyson K. Menzies, Michael J. L. Peers, and Emily K. Studd

Department of Environment, Government of Yukon, Whitehorse, Yukon, Canada (TSJ, PMK); Department of Renewable Resources, University of Alberta, Edmonton, Alberta, Canada (TSJ); Department of Biological Sciences, University of Alberta, Edmonton, Alberta, Canada (SMK, YNM, MJLP); Department of Natural Resource Sciences McGill University, Montréal, Québec, Canada (AKM, EKS)

Title: Short-term effect of helicopter-based capture on movements of bison (*Bison bison*)

Capture and handling wildlife is often required to obtain demographic, behavioural, or physiological data. However, capturing wildlife sometimes lacks public support. Thus, investigating the potential impacts of capturing wildlife is important in terms of informing public debate, as well as establishing data censoring protocols. Here, we investigated the short-term effect of helicopter-based capture and handling on the movements of free-ranging bison (*Bison bison*). We examined daily movement rates, home range size, and displacement of GPS-collared individuals after being captured. Our results indicate that there is minimal, short-term impact of capture on bison movements. In our sample, significant differences from baseline behaviour was observed only within the first 24 hrs after release; however, we observed variation among individuals. Some animals took up to 10 days after capture to return to baseline movements while others had no measurable response. Despite individual variation, 80% of individuals had returned to normal movements within five days after capture. Furthermore, there was a significant difference in the response to being captured by the sexes, with females increasing their movements, and males having decreased movement, after capture. Our results suggest that the effects of capture on movement is unlikely to have severe negative fitness effects on bison, and researchers should censor the first 10 days after capture. We encourage similar studies to inform data censoring protocols and public discourse about wildlife captures.

Jessica Norris, Thomas S. Jung, Piia M. Kukka, Brian G. Slough, and Kathryn E.H. Aitken

Department of Renewable Resources, University of Alberta, Edmonton, Alberta, Canada (JN, TSJ, KEHA); Department of Environment, Government of Yukon, Whitehorse, Yukon, Canada (TSJ, PMK); Whitehorse, Yukon, Canada (BGS)

Title: Beyond exit counts: using a capture-mark-recapture approach to estimate the size of a meta-colony of little brown bats (*Myotis lucifugus*)

Little brown bat (*Myotis lucifugus*) colonies play an important ecological role within their surrounding ecosystem. Previous population estimations have been conducted in the southern Yukon territory, however, little is known about the current abundance and distribution of the species. Little brown bats in Canada are Endangered in the federal *Species at Risk Act*. This is due to many negative impacts affecting the species including climate change, habitat loss, and, particularly, the disease known as white nose syndrome. White nose syndrome is responsible for millions of little brown bat mortalities in the eastern regions of North America and is expected to move into other inhabited areas. Monitoring the species for the purposes of conservation and increasing knowledge is of high importance in Yukon. This study provided new data that contributed to a long term monitoring project of little brown bats in southern Yukon. A colony located at Squanga/Salmo Lake in the southwest Yukon was selected for mark-recapture sessions. Six sessions were completed between the months of June and July, 2018. Data was analyzed using 5 mark-recapture models with Density 5.0. A total of 278 individuals were captured 320 times during the 6 trapping occasions in 2018 compared to 517 individuals captured 705 times during the 4 trapping occasions in 2012. Results show the Darroch model was the most supported and highest ranked 904 ± 120.2 (95% C.I. = 709.3-1197.7), compared to 2012 when the Huggins model was the most supported population estimation 874.4 ± 44.4 (95% C.I. = 797.4 -972.5). Recapture probability was estimated as low with an average of 6% compared to 2012 average recapture probably of 59%. Geometric population growth rate was calculated using highest ranked estimations for 2012 and 2018 which resulted in $\lambda = 1.037$.

Julie Thomas and Thomas S. Jung

Department of Environment, Government of Yukon, Whitehorse, Yukon, Canada (JT, TSJ); Department of Biological Sciences, University of Calgary, Calgary, Alberta, Canada (JT); Department of Renewable Resources, University of Alberta, Edmonton, Alberta, Canada (TSJ)

Title: Rural communities in the boreal forest are islands of habitat for synurbic little brown bats (*Myotis lucifugus*)

Urban development is detrimental to many species; however, little brown bats (*Myotis lucifugus*) may be attracted to human settlements and may be a “synurbic” species. Buildings and human-made bat houses provide apparently high quality roosting habitat, which may be a limiting factor in the boreal forest, where trees are typically small and subject to a short fire interval cycle. In the boreal forest there are relatively few urban developments in a matrix of wilderness and seemingly suboptimal natural roosting habitat. Given their potential attractiveness as roosting habitat, we asked whether isolated rural communities are islands of summer habitat for little brown bats in the boreal forest. To test this hypothesis, we investigated the relationship between little brown bat activity, foraging rates, and proximity to urban centres. We used acoustic detectors to monitor bat activity near three small, rural communities in Yukon, Canada, and characterized bat habitat with remote sensing data. Bat activity increased with proximity to community centers, but foraging activity did not, suggesting that communities were important as roosting rather than foraging habitat. Bats were also attracted to waterbodies and areas with relatively high densities of linear features (e.g. roads and transmission lines). Our study advances knowledge of little brown bat habitat requirements in the boreal forest, where little is known and better information is required to help identify habitats critical to their recovery.

YUKON BIODIVERSITY FORUM

Yukon Beringia Interpretive Centre

Saturday March 2nd, 2019



8:30	COFFEE & TEA HOSTED BY THE YUKON CONSERVATION DATA CENTRE	
9:00	Dave Mossop Yukon Research Centre Yukon College	<i>Are American Kestrels in Yukon (Canada) showing signs of being in a "Predator Pit"?</i>
9:20	Thomas S. Jung Fish and Wildlife Branch Environment Yukon	<i>Freezer meals: comparative value of muskrat (Ondatra zibethicus) push-ups as late-winter forage for a northern ungulate</i>
9:40	Pam Sinclair* , Marty Mossop and Shannon Stotyn Canadian Wildlife Service	<i>Life in the riverbank: nesting ecology of Bank Swallow Riparia riparia in southern Yukon</i>
10:00	Dawn Hansen Tr'ondëk Hwëch'in and EDI Environmental Dynamics Inc	<i>Stock Restoration Planning and Klondike River Chinook In-Stream Incubation Trial</i>
10:20	COFFEE & TEA HOSTED BY THE YUKON CONSERVATION DATA CENTRE	
10:40	Jill Johnstone Northern Plant Ecology Lab	<i>Resilience of black spruce forests to fire in the northwest boreal region</i>
11:00	Jane Harms* , Emily Chenery, Peter Molnar, Meghan Larivee, Michelle Thompson, and Julianna Campbell Program Veterinarian Environment Yukon	<i>The Yukon Winter Tick Monitoring Project: Understanding the impacts of climate change on a wildlife parasite</i>
11:20	Wayne Strong* and Dave Mossop Yukon Research Centre	<i>The Yukon Research Herbarium Project</i>
11:40	Jonathan Lowey EDI Environmental Dynamics Inc.	<i>Pine Creek Arctic grayling assessment and habitat improvement</i>
12:00	LUNCH HOSTED BY YUKON CONSERVATION DATA CENTRE	

1:00	Bruce Bennett <i>Yukon Conservation Data Centre Environment Yukon</i>	<i>Tombstone BioBlitz 2018 Results</i>
1:20	Sonny Parker* , Katie Aitken and Dave Mossop <i>University of Alberta and Yukon College</i>	<i>Analysis of Long-term Nest Box Use in Southern Yukon: Trends and Relationships Among Secondary Cavity Nesters</i>
1:40	Adil Darvesh <i>Communication Coordinator CPAWS</i>	<i>Safeguarding our ecological identity: Why the Yukon needs laws that protect species at risk</i>
2:00	Hilary Cooke* and Lila Tauzer <i>Wildlife Conservation Society Canada</i>	<i>The migratory spectacle of Yukon's Tintina Trench: a study of spring migration of waterfowl and sandhill cranes.</i>
2:20	COFFEE & TEA HOSTED BY THE YUKON CONSERVATION DATA CENTRE	
2:40	Don Reid <i>Wildlife Conservation Society</i>	<i>Phenology of hatching and food in low Arctic passerines and shorebirds: is there a mismatch?</i>
3:00	Al von Finster	<i>Potential River Channel below the Tweedsmuir Glacier: Implications for Pacific Salmon Utilization of the Upper Alsek River Basin</i>
3:20	Tara Stehelin* and Fiona Schmiegelow <i>University of Alberta and Yukon College</i>	<i>Predicting present and future distribution and abundance of Olive-sided Flycatcher (<i>Contopus cooperi</i>) and Western Wood-pewee (<i>C. sordidulus</i>) in northwestern North America using climate and landcover</i>
3:40	Crispin Guppy <i>Ecofor Consulting Ltd.</i>	<i>Cryptic butterfly species in the arctic-alpine</i>

(* presenter)

Posters Available for Viewing

Nina Vogt

University of Alberta and Yukon College

Title: Effects of permafrost thaw on vegetation and its value to Southern Lakes Caribou habitat in Yukon

Bruce Bennett

Environment Yukon

Title: A Snapshot of Yukon Biodiversity – what makes up Yukon’s biodiversity by group

Piia Kukka - *Co-authors: JR Werner, LM Andresen, CJ Krebs and TS Jung.*

Environment Yukon

Title: Landscape drivers of site occupancy by remnant populations of arctic ground squirrels (*Urocitellus parryii*)

Thomas S. Jung - *Co-authors: Sean M. Konkolics, Piia M. Kukka, Yasmine N. Majchrzak, Allyson K. Menzies, Michael J. L. Peers, and Emily K. Studd*

Environment Yukon

Title: Short-term effect of helicopter-based capture on movements of bison (*Bison bison*)

Julie Thomas - *Co-author: Thomas S. Jung*

Environment Yukon

Title: Rural communities in the boreal forest are islands of habitat for synurbic little brown bats (*Myotis lucifugus*)

Jessica Norris - *Co-authors: Thomas S. Jung, Piia M. Kukka, Brian G. Slough, and Kathryn E.H. Aitken*

University of Alberta and Yukon College

Title: Beyond exit counts: using a capture-mark-recapture approach to estimate the size of a meta-colony of little brown bats (*Myotis lucifugus*)