



THE WILDLIFE SOCIETY

Leaders in Wildlife Science, Management and Conservation

British Columbia Chapter



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Another night of insomnia. Last night I lay awake wondering how to communicate my ideas and concerns to influence a suite of natural resource use decisions affecting British Columbia wildlife.



No, not influence...inspire! Yes, I want to inspire their decisions to help me achieve improved wildlife management and conservation outcomes. But where does such inspiration come from? How can I inspire the required action? It turned out to be a long night... but sleep eventually returned. In the morning, while savoring the aroma of my coffee and appreciating the effects it was having to combat my groggy head, I sat down at my computer wondering what to write for this newsletter edition.

Still contemplating my late-night thoughts regarding inspiration, I happened across the BC TWS framework (<http://www.bctws.ca/program-framework.html>). I chuckled at the serendipity of the first sentence, "...The Wildlife Society's (TWS) mission is "To inspire, empower, and enable wildlife professionals to sustain wildlife populations and habitats through science-based management and conservation". A succinct description of my current professional needs! (continued on page 2)

Continuing to read, our chapter framework speaks to a group dedicated to sound wildlife management and conservation of the rich wildlife heritage of British Columbia. We are composed of individuals interested in the art and science of applying the principles of ecology and do so through mutual professional support, sharing of information, and promoting our future generations of wildlife professionals.

Inherent in these words is the recognition that the wildlife management challenges we today face are often too large for any one of us to singly affect, and that we are better together. The answers I seek surrounding inspiration are to be found with you. Together, we inspire and support one another to continue with our valuable work. We seek new collaborations and share with one another our learnings, triumphs, and failures. We mentor those who are ready to take on these tasks into the future.

If you have not otherwise heard about it, I am pleased to share that another opportunity to meet and inspire one another is approaching. We have selected “Our Future Together” as the theme of our 2nd Annual Conference to be held 19-21 March at the Prince George Civic Center. I am excited to again be on the team helping to plan our next fantastic conference and based on the success of last year’s event in Kelowna. I have little doubt that when we get together, I will find continued inspiration. Read more about the conference on page **12** and please contact us with your ideas to make the conference great! Also, please know that we will again have a silent auction, so start thinking about merchandise to contribute (perhaps re-gift that wildlife themed item you got from your mother-in-law?), but rarely use. I hope to see you there and look forward to hearing about your research, ideas, success, and potential collaborations on how we can create a better future for wildlife and their habitats.

~Scott Yaeger

BCTWS - Help Wanted!

Looking for a way to become involved with the BCTWS in a small way? We are recruiting a volunteer to help run our social media accounts! This means creating and sharing content to keep our members engaged and connected through Twitter, Instagram, and Facebook! Email us at tws.bc.chapter@gmail.com if you're interested in getting involved!



Executive Update:

2020 Elections!

It will soon be time to hold an election for the 2020 Executive of our Chapter. Please consider helping out the BC Chapter of the Wildlife Society and wildlife in British Columbia by volunteering to serve on our executive in 2020. Past executive members will tell you that it's a collegial and interesting experience, and a chance to network and meet other wildlife professionals. A formal call for nominations will be sent to members early in October, then an email ballot which will be sent out at the beginning of December. The positions open for election are:

- President-elect (2-year term, 1 as President-elect and 1 as President)
- Secretary-Treasurer (1-year term)
- Student Director (1-year term)
- Director-at-large (2-year term)

The current President-elect, Bill Harrower, will transition in the President's position for 2020. Scott Yaeger will then become Past president.

Please contact Rod Davis who is the chair of the Nominations and Elections Committee at roddavis@shaw.ca if you have any questions or ideas.

Provincial Project Snapshots

CONTRIBUTED BY JOEY CHISHOLM, MSC CANDIDATE,
THOMPSON RIVERS UNIVERSITY

The subboreal forests of Central British Columbia have faced unprecedented changes in recent years. The pine beetle outbreak and associated salvage logging have altered large forested areas as have recent large fires, which are likely to become more frequent and severe with a changing climate. It is therefore a critical time to properly manage these forests in order to maintain biodiversity and ecosystem function.

Often overlooked in forest management are the smaller and more common mammals such as hares and squirrels. Although these animals are a critical food source for many species of mesocarnivores and raptors, as well as occasional prey items of larger carnivores, they tend to receive less research and management attention. Extensive work has been done on red squirrels and snowshoe hare in the Yukon but less so in British Columbia. Much of the work in British Columbia has focused on impacts of these species to forestry operations; however, some habitat-use studies also have been done. Most habitat use studies on these species have focused on stand level characteristics and knowledge of fine-scale habitat use is incomplete.

For my graduate thesis at Thompson Rivers University, I am determining fine-scale habitat use of snowshoe hare (*Lepus americanus*), red squirrels (*Tamiasciurus hudsonicus*) and northern flying squirrels (*Glaucomys sabrinus*). To do this, I am partnering with the John Prince Research Forest (JPRF) located near Fort St. James, BC. Biologists at JPRF have developed a long-term camera monitoring program for mesocarnivores. From the camera monitoring they created a large database of wildlife detections across of a variety of landscape types. I plan to use these camera detections in combination with habitat data collected through remote-sensing (LiDAR) and manually in the field in order to model occupancy for each study species across the research forest and surrounding crown land.

In addition to occupancy-based habitat models I plan to also model snowshoe hare habitat use at a fine-scale using hare pellet data we have been collecting over the past two years. This provides an opportunity to not only look at habitat use at two different ecological scales but also to compare two different passive detection techniques. For the squirrels I also plan to run interaction models to see if the presence or absence of one species affects the distribution of the other. It has been suggested that northern flying squirrels may, for a least part of the year, raid red squirrel food caches. I am hoping to see if this potential interaction has any effect on the habitat use of either species.

In general I am hoping my project is able to fill some gaps on the habitat needs of these three species. This would help for better forest management, especially when managing for the mesocarnivore species that rely on them. I also am hoping my project refines and encourages the use of wildlife cameras and occupancy modeling as an alternative to more intrusive and expensive traditional habitat use studies (e.g. trapping and tagging).

<http://karllarsen.sites.tru.ca/current-students/joey-chisholm/>



Provincial Project Snapshot—how you can share your research from the past, now, or proposed, with members. Or you can state why BC wildlife are important to you. Send a summary of (~ 300-500 words) to tws.bc.chapter@gmail.com with “project snapshot” in the subject line.

Provincial Project Snapshots

**CONTRIBUTED BY MARCUS ATKINS, MSC CANDIDATE,
THOMPSON RIVERS UNIVERSITY**



Various projects investigating rattlesnake ecology and the implications for their management are ongoing at Thompson Rivers University. The over-arching goal of this program is to better understand the ecology of these animals, how various factors (both natural and anthropogenic) are affecting populations, and how management regimes and tactics may be developed to allow these animals to persist. The majority of snake species in BC are at-risk, partially due to the fact that many also reach their northern periphery in BC. This means the populations are naturally limited in their ability to expand their range and densities; when additional anthropogenic stressors are placed on populations, the cumulative effect may be quite serious.

MSc student Marcus Atkins is investigating how rattlesnake populations have changed through time, and the effect of land management regimes. His study is situated in Vernon, BC, where a pivotal rattlesnake study in the 1980s (by Malcolm Macartney) and diverging land management regimes (park versus ranching) has created a fortuitous unplanned experiment. Atkins is revisiting the site to collect a new set of demographic data (denning populations sizes, composition, body condition, sex ratio, etc.) and, with the Macartney data, he is

examining how the snake population has spatially and temporally changed through time. He has also added telemetry to his study to provide a better understanding of habitat use by the animals during the summer. Partners on this project include Dr. Purnima Govindarajulu, BC Parks, the Habitat Conservation Trust Fund, and the Forest Enhancement Society of BC. Further south in the Okanagan Valley, another project is underway in the White Lake Grasslands Protected Area. Previous research in our lab (Winton MSc, 2018) strongly questioned the ability of the population to persist into the future due to road mortality. Attempts to mitigate this impact have been implemented, and now a new MSc student, Jade Spruyt, is continuing with 'Phase 2' where she is examining the effectiveness of eco-passage culverts along the highway. In addition, she is investigating the use of roadside habitat by gravid females. Partners on this project include the Dominion Radio Astrophysical Observatory, the National Research Council, The Nature Trust, the BC Ministry of Highways and Infrastructure, and Dr. Christine Bishop from Environment & Climate Change Canada.

Our longest-running snake study site is situated in Osoyoos, BC. Research on snakes in this area, and their ability to sustain the pressure of widespread development, has been ongoing for nearly 15 years through a strong partnership with the Osoyoos Indian Band and the Nk'Mip Desert Cultural Centre [who recently received national recognition for herpetological conservation]. A number of graduate theses have been produced through this study. Currently, MSc student Dana Eye is continuing the long-term monitoring program while also investigating the use of rookeries by gravid female snakes. Her work has included both empirical and experimental work designed to reveal the specificity of rookery sites and the factors behind their selection by the snakes. Dr. Christine Bishop has been a strong supporter and co-supervisor of all the graduate student work done to date at this site. Other snake projects occurring at TRU include investigations of the age structure of northern peripheral populations through skeletochronology, and the timing and activity patterns of rattlesnakes at hibernating sites throughout the province. That latter is particularly interesting in view of the projected climate change patterns that will occur, and how snake populations may or may not alter their behaviour in response.

<https://karllarsen.sites.tru.ca/current-students/marcus-atkins/>

Provincial Project Snapshots



THE IMPORTANCE OF ESTUARIES IN SPRING CONTRIBUTED BY PAT BAIRD, M.A., PH.D. , SFU-CWE AND KAHILTNA RESEARCH GROUP

Estuaries are important sources of nutrients for the marine ecosystem. The spring freshet carries dissolved organics like phosphate and nitrogen and replenishes the nearshore environment depleted in these nutrients. This freshet also adds fresh water to the system which helps trigger various physiological processes in the microphytoplankton there. Estuaries with seaweed and sea grass are also important areas for growth and development of immature fish. Estuarine mudflats are necessary for growth and development of marine invertebrates and for migrating shorebirds, and this big change in their environment in spring jump starts their growth and development.

The Fraser River delta south of Vancouver BC has the largest estuary in BC, and supplies food and nutrients not only to marine life in the mudflats but also to wildlife in the Strait of Georgia where nutrients are carried by the currents. You can see this flow extending far and wide when flying out of YVR.

A large proportion of the population of western sandpipers, *Calidris mauri*, and the western population of dunlin, *Calidris alpina*, stage on the Roberts Bank mudflats in the Fraser River Estuary on their spring northward migration, obtaining energy and nutrients from invertebrates and microphytoplankton like marine diatoms before their long nonstop flight of up to 2000 km to their first rest stop in Alaska. They probe in the mud as usual for invertebrates, but at this final stop, they lap up diatoms in the biofilm with their bristly tongues. Over 70 species of shorebirds have these bristles, indicating widespread consumption of biofilm. This discovery is fairly recent; with a finding that biofilm makes up 45-59% of the stomach contents of western sandpipers.

What is it that diatoms have that shorebirds need for nonstop long distance migration? We found that they are about the only group on earth that produce long chain essential fatty acids like eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA), which are highly unsaturated fatty acids with 5-6 double bonds and lengths of 20 – 22 carbons. Diatoms also produce polyunsaturated acids with more than one double bond (e.g. linolenic and alpha linoleic acid), monounsaturated fatty acids – one double bond - like oleic acid (olive oil component), and saturated fatty acids with no double bonds – like stearic acid. Monounsaturated and saturated fatty acids are found in great abundance in fat stores of these birds. However all polyunsaturated fatty acids are found in very low proportions (<5%) in depot fat. Researchers thought these long complex fatty acids were not that important for migration. However, our team found that these molecules are not important for energy because they are bioactive, not for energy. They bypass the liver and go directly into the bloodstream of all heterotrophs where they attach to cell membranes, act as ligands, changing the shape of surface proteins. This act sets off a physiological cascade of important metabolic processes which are critical for growth and development of all heterotrophs – e.g. marine worms, bivalves, fish, and birds.

In laboratory experiments, heterotrophs (e.g. copepods, amphipods, bivalves, fish) fed diatoms or diatom predators containing low amounts of EPA and DHA have poor reproduction and growth, as well as physiological problems like bleeding and inflammation. EPA and DHA turn off inflammatory pathways, boost immunity, decrease insulin resistance so that even at low levels of glucose in the blood, cells can uptake glucose to burn it to the greatest extent possible. In a nutshell, these long chain essential fatty acids jump start spring growth in the intertidal for everything from zooplankton like copepods (salmon and others' food), amphipods, marine worms, bivalves, and young fish like capelin and the endangered Fraser River salmon. Also, seabirds, and marine mammals passing through the Georgia Strait are able to gain these bioactive molecules from prey they eat that have gotten a boost in their EPA and DHA stores, because these highly unsaturated fatty acids are not burned up or used up physiologically. In attaching to membranes, they turn genes on or off and thus initiate vast physiological processes. They then can release and go to other cell membranes and start the process all over again. So they are vital for the marine ecosystem and are bioaccumulated. (Continued next page)

Provincial Project Snapshots

(Continued from page 6) However, marine diatoms have greater stores of EPA and DHA than do freshwater diatoms, and these two groups live in different areas of the Fraser River delta, with marine diatoms residing mainly at Roberts Bank where shorebirds forage the most. The manufacture of these molecules by diatoms is initiated by shock or stress from the spring freshet where large quantities of freshwater are added to the tidal marine waters where marine diatoms live. Likewise, the freshet supplies large quantities of nitrogen and phosphorous which trigger marine diatoms to produce EPA and DHA. The turbulence of the water also shocks them to produce more. So the spring runoff is a perfect storm for initiating spring growth and reproduction in the marine food web. It also occurs just when shorebirds fly north to Roberts Bank and stage before their nonstop flight, and when the nearshore ecosystem gears up for spring reproduction and growth, supplying food for the entire marine food web there. It is postulated that EPA and DHA turn on genes in these birds' flight muscles which alter them to long distance and not short hop muscles to allow them the 2000 km nonstop flight.

Why is this study important? Developers need to understand that marine diatoms in estuaries are the bottom of the food chain and their survival is critical for a functional food web. Estuaries and mudflats are often prime areas for cities to build ports, recreational structures, seawalls, and the like, and these can not only physically destroy the functioning estuary but also can alter water flow so that it can become more freshwater than marine, or more silty, making the area inhospitable for marine life that used to live there. Thus, in any nearshore construction project, the entire food web needs to be addressed and studied well in order to understand the intricate workings of all trophic levels in concert. Once an estuary is developed, it cannot return to its original state, despite efforts to do so.

I had always studied apex predators like seabirds (puffins, gulls, penguins) and it has been quite the revelation to go the opposite way to the bottom of the food web. I have a new and awed respect for diatoms and their niche in the marine ecosystem.

—Pat Baird, M.A., Ph.D. , SFU-CWE and Kahiltna Research Group

Mentoring Column

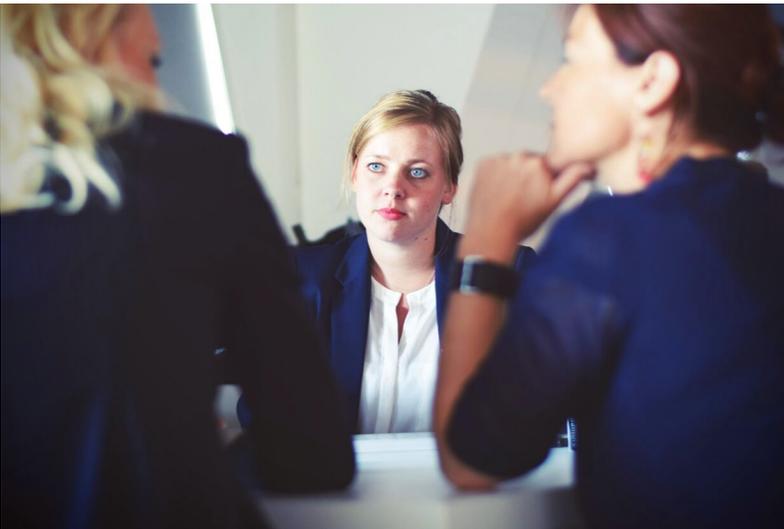
INTERVIEWING (FROM THE YWCA VANCOUVER)

Interviews have changed in recent years. More and more employers are starting to use a behavioral interviewing style. Behavioural interviewing (also known as behavioural event, competency, situational or behavioural based interview) is based on the premise that your past behaviour is the best predictor of your future behaviour.

Behavioural questions usually start with Tell me about...or Describe... or "Give me an example of..."

A behavioural based response requires specific examples of past events that

(Continued on next page)



(continued from page 7) demonstrate skills and abilities rather than responding to a hypothetical situation. Employers want you to provide detailed accounts of what you have done, said, thought and felt in situations, similar to situations you will encounter in the job you are applying for. You can use relevant examples from your current job, a previous role or a situation outside of work altogether, such as volunteering or participation in sports or other activities. Interviewers will be interested in the outcome of the situation, whether there was anything you learned from the experience, etc.

Often, a position is assessed for the skills/competencies and characteristics that relate to job success. Interview questions are then developed based on these skills and competencies. Many times, all candidates will be asked the same questions and notes will be taken in order to evaluate candidates.

There are two basic levels of competencies: technical and behavioural. The first level, technical competencies are predominately about acquired knowledge and technical abilities and skills. These competencies are often easier to see, train for and develop. Examples of technical competencies include knowledge of applicable codes and standards, industry best practices, and the application of tested and tried industry training standards. The second level of competencies is behavioural competencies, such as communication skills or team skills. These competencies can be harder to see and develop but are key indicators of how an individual approaches his/her work.

Other tips:

- For example, instead of asking, “What is being a good project manager?” a candidate would be asked, “Describe a situation that could have been a crisis and that you overcame. What were the circumstances? What were your specific actions? What was the result?”
- After you leave an interview write down all the questions you were asked. Many organizations have favourite behaviour based questions that will be used in many if not all competitions. If you bomb a question make sure you have a great answer prepared next time!

Jobs & Opportunities:

The Galiano Conservancy Association, located on Galiano Island, is seeking applicants for the position of Executive Director. The Galiano Conservancy celebrates its 30th anniversary this year. Established in 1989 as one of the first community-based land trusts in BC, we have grown to become a recognized leader in conservation, ecological restoration, and environmental education. The job details are posted here: <https://galianoconservancy.ca/about/job-opportunities/>

The Galiano Conservancy is also seeking a part-time Operations Coordinator. The position is also posted on the website.

~Adam Huggins Restoration Coordinator Galiano Conservancy Association (778) 322-0607
| restoration@galianoconservancy.ca

Jobs & Opportunities:

Alberta Biodiversity Monitoring Institute

Competition No. S106140194

Posting Date: Sep 16, 2019 Closing Date: Oct 07, 2019

Position Type: Full Time

Grant Funded Salary Range: \$67,057 to \$92,809 per year

Grade: 10 Hours: 40

This position is for 1 year with the possibility of renewal and offers a comprehensive benefits package which can be viewed at: Faculty & Staff Benefits. Working in the ABMI's Application Centre and reporting to the ABMI Operations Manager, the Caribou Recovery Ecologist is responsible for supporting the operational delivery of ABMI products and services related to the Caribou Monitoring Unit. For more information see: <https://www.careers.ualberta.ca/Competition/S106140194/>

Carnivore Research Assistant Position in Portland, OR

Closes: 10/20/2019

The Institute for Natural Resources invites applications for a full-time (1.00 FTE), 12-month, Faculty Research Assistant position. Reappointment is at the discretion of the Director. The position will support a growing academic research lab focused on understanding the effects of biotic and abiotic factors on the demography and habitat associations of wildlife of conservation and management concern in the western United States. Our research primarily focuses on how small population sizes, habitat limitations, land management activities, and changes in climate influence population trends and behavior of carnivores. We collaborate with a diverse group of stakeholders to guide and evaluate conservation action and inform management policy through evidence-based research. Current research focuses include the effects of wildfire on carnivore and small mammal communities in northern California and southern Oregon, the effects of climate change and habitat variation on species interactions and distributions in the Sierra Nevada, and the distribution, density, and habitat associations of rare carnivores in Yosemite National Park. The incumbent will have opportunities to assist with current and ongoing research. The incumbent will also manage a long-term research project in the Klamath-Siskiyou ecoregion of northern California and southern Oregon. This position is responsible for managing a field crew and participating in research non-invasively monitoring fishers in the field. Monitoring activities will include deploying baited hair sampling stations, track plates, and trail cameras. The incumbent will also assist with data organization and summary, spatial and statistical analyses, and writing reports, manuscripts, and proposals for this and other projects. The position is anticipated to start December 1, 2019. This fixed term position will be grant funded and will be extended at annual intervals dependent on sufficient funding. The incumbent will be based in the Portland office of Oregon State University's Institute for Natural Resources on the campus of Portland State University during most of the year. The incumbent will also be based in Yreka, CA from early September through November annually to manage the Klamath-Siskiyou Carnivore Project. Housing will be provided in Yreka between September and November. Housing will not be provided in Portland.

<https://jobs.oregonstate.edu/postings/83090>

Jobs & Opportunities:

BIO 27R - Wildlife Habitat Specialist

Salary Range \$69,900.80 - \$79,791.25 plus 3.3% Temporary Market Adjustment; the Smithers location also receives a \$32.89 bi-weekly isolation allowance.

Close Date 10/14/2019

Job Type Regular Full Time Temporary End Date

Ministry/Organization BC Public Service -> FLNRO and Rural Development Ministry Branch / Division Wildlife and Habitat Branch / Resource Stewardship Division

The Ministry of Forests, Lands, Natural Resource Operations and Rural Development is responsible for stewardship of Provincial Crown land and natural resources, and protection of B.C.'s archaeological and heritage resources. Overseeing a land base of 94.8 million hectares, the Ministry supports the sustainable management of forest, mineral and land resources, the prosperity, viability and competitiveness of industries that use them, and public access for a wide range of activities such as hunting, fishing and recreation. The Ministry is responsible for policy development, operational management and implementation, and oversees over 50 statutes and associated regulations. As the provincial expert, the Wildlife Habitat Specialist provides authoritative advice and recommendations regarding all aspects of wildlife habitat management including science, policies, inventories, restoration and best practices. The Wildlife Habitat Specialist leads or contributes to research projects, policies, best management practices and other tools to advance conservation, enhancement and restoration of habitat. This position collaborates with First Nations and a wide network of internal and external stakeholders and other jurisdictions and ministries to conduct consultations, develop partnerships, exchange information and advance wildlife habitat management objectives, policies and programs.

For complete details about this opportunity, including accountabilities, please refer to the attached job profile. For specific position related enquiries, please contact Steve.Gordon@gov.bc.ca. DO NOT SEND YOUR APPLICATION TO THIS EMAIL ADDRESS. For more information about how to create or update your profile and how to submit your application, please refer to the Job Application page on the MyHR website. If you are still experiencing technical difficulty applying for a competition, please send an e-mail to BCPSA.Hiring.Centre@gov.bc.ca, before the stated closing time, and we will respond as soon as possible to assist you. NOTE: Applications will be accepted until 11:00 pm Pacific Time on the closing date of the competition. In order to be considered for this position, your application must clearly demonstrate how you meet the education, experience and professional designation requirement as outlined below:

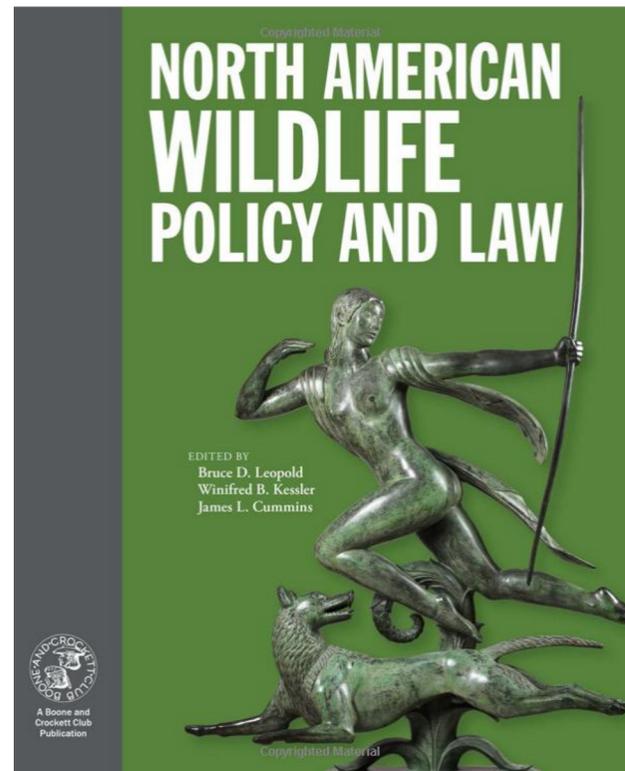
Bachelor's Degree or higher (Master's or PhD degree is preferred) in biology, ecology or a related discipline; AND three (3) years recent (within last 5 years) related* experience; AND as a condition of employment, candidates must have (or obtain within six months of commencing employment) and maintain professional accreditation as a Registered Professional Biologist.

<https://bcpublicservice.hua.hrsmart.com/hr/ats/Posting/view/63009>

Literature Review

North American Wildlife Policy and Law edited by Bruce D. Leopold, Winifred B. Kessler, & Bruce D. Leopold, is a newly released textbook that examines natural resource policy and law in North America and is a vital resource for academics, legislators, policy makers, First Nations and tribal leaders and everyday wildlife professionals.

Referencing the work of prominent wildlife professors, top-level biologists and natural resource professionals throughout the world, this comprehensive text examines the history and foundation of policy, reviews and analyzes major federal, state, and provincial laws and policies important to natural resource management, and most uniquely, discusses application and practice of policy to ensure sustainability of wildlife, fish and their habitats.



Already recognized with several prestigious awards, this could be the next must-have textbook for your library. For more information and to order your copy, visit:

<https://www.boone-rockett.org/nawpl/index.html>

From the Authors:

James L. Cummins - "As wildlife professionals, it is our duty to maintain and improve this world-class system of conservation we have throughout North America... Science is no longer enough as we must constantly address the political, economic, social, and other challenges facing wild places and wild things. And more often than not, that is in the policy arena. This text is a must-have for upcoming and current professionals who want to advance this precious resource for generations to come".

Winifred B. Kessler – " This is the textbook I wish had been available during my decades of teaching and working in Government"



The BCTWS exec are thrilled to announce that the **2nd Annual BCTWS Conference and Workshop** will be held in beautiful Prince George March 19-21, 2020. Keep an eye on your email and our social media pages for more details coming soon! Spread the word and save the date! <http://www.bctws.ca/2020conference.html>

Coming soon:

-Call for abstracts

-Registration

BCTWS 2020 Conference - Help wanted!

The 2019 Conference was a huge success due to the work of our amazing members who volunteered their time. We have a number of volunteer positions to fill - big and small. Email us at tw.bc.chapter@gmail.com if you're interested in being involved or learning more!