The Alaskan Wildlifer

Newsletter of the Alaska Chapter of the Wildlife Society

Winter Issue - February 2015

Message from President Grant Hilderbrand

I hope everyone had a safe and enjoyable holiday season. I know we are all getting ramped up for late winter and spring field work, and many of us are still hoping for more snow for both work and play.

I wanted to share a few highlights regarding Chapter activities over the past few months. Following the election, the chapter sent a letter to the new administration welcoming them to office, thanking them for their willingness to serve, and offering our time and expertise as a source of information as they wrestle with wildlife issues facing our state. In January, national TWS signed on with a number of other resource and conservation organizations to a letter to the president opposing harvest of old-growth from the Tongass National Forest. A number of chapter members provided feedback and insights through that process. Also in January, the chapter supported a Board of Game proposal adding lands to Palmer Hay Flats State Game Refuge and a Senate bill to add lands to Creamer's Field Migratory Waterfowl Refuge. Finally, the chapter has launched a special committee to develop and administer an awards program. This committee will be chaired by Tom Paragi.

The main activity of the chapter over the winter has been organizing the **2015 Annual Meeting scheduled for Juneau April 13-17**. We have a number of great workshops, symposiums, and activities planned. In addition, our meeting is merging with the Northern Furbearer Conference this year. Look for more details in this newsletter and in coming months. Huge thanks to Scott Brainerd and his team for organizing the meeting. We have had many, many members offer ideas and time in this regard to date. It is a labor of love, but labor none the less. I hope to see you all there!

Issue Highlights

Regional News

Northern

Todd Brinkman, Northern Representative

Personnel Changes

Dr. Perry Barboza, Professor of Biology, will be leaving UAF during summer 2015. Dr. Barboza has accepted a Professorship in the Department of Wildlife and Fisheries Sciences at Texas A&M University. Perry has been making important contributions to wildlife research and education in Alaska since 1997. He has served as principle advisor for approximately 12 graduate students, served on the advisory committee for another 20 graduate students, produced 70+ peer-reviewed journal articles, and received the Outstanding Book Award in 2010 from The Wildlife Society for Integrative Wildlife Nutrition. Dr. Barboza is firmly established as an internationally-recognized scientific leader in the field of wildlife nutrition. Perry convened two symposia on wildlife nutrition for TWS national meetings in 2006 and 2009. He has been a strong advocate for getting students involved in TWS, serving as the mentor to the Alaska Student Chapter on several occasions. Despite relocating 3,000+ miles away, Perry will continue to collaborate on research in Alaska. He has a couple Alaska–based projects underway that will continue for at least three years. At Texas A&M, Dr. Barboza will maintain a focus on large mammal ecology with an emphasis on wildlife nutrition. During a recent chat with Perry, I asked him to reflect on his time at UAF. With regards to wildlife science, Perry talked about how much he has learned about the significance of making good predictions about wildlife populations before they "fail." He also mentioned that his work has enhanced his awareness of the social consequences of wildlife research. Dr. Barboza commended the Alaska Chapter's emphasis on student engagement. He noted his enjoyment of the annual meetings and his appreciation of the commitment to education of both students and established professionals. Lastly, Perry spoke fondly of the comfortable atmosphere of the Chapter meetings. In particular, he likes the approachable, collegial, and informal nature of its members. Thank you, Perry and best of luck in your new position!

TWS-Alaska Chapter Regions (Northern, Southcentral, and Southeast)

David Payer, Supervisory Ecologist for the Arctic National Wildlife Refuge has accepted the position of Coordinator for the Arctic Landscape Conservation Cooperative.

ADF&G recently hired **Adam Craig** as the Division of Wildlife Conservation, Region V, Biometrican. Adam has worked for the Division of Sport Fish for the past 12 years, and will continue to be based in Anchorage while working on wildlife issues in northwest Alaska. **Sara Longson** joined the Wildlife Health and Disease Surveillance Program with ADF&G in Fairbanks in January as a Wildlife Biologist I. She comes to us from ADF&G SF division in Homer, and her background includes a B.S. in biology from Northeastern University in Boston and she is a Certified Veterinary Technician with extensive experience in veterinary private practice with anesthesia and managing controlled substance records.

Charles "Danny" Caudill will start in March as the new Wildlife Biologist III predator-prey research biologist with the ADF&G Division of Wildlife Conservation office in Fairbanks. He received his B.S. from the University of Tennessee in Wildlife and Fisheries Science and his M.S. from Utah State University in Wildlife Biology where he conducted research pertaining to the population dynamics and impacts of hunter harvests on Sage Grouse. He is leaving his position with the Florida Fish and Wildlife

Conservation Commission as the state's lead principal investigator on upland gamebird research, where he conducted research on wild turkeys and coyotes.

Wildlife Economic Report
ADF&G commissioned a study by ECONorthwest on "The economic importance of Alaska's wildlife in 2011" that was released in May 2014. "Spending on hunting and viewing totaled $3.4 billion in 2011 but generated $4.1 billion in economic activity in the state, over 27,000 jobs, and $1.4 billion in labor income" Visit http://www.adfg.alaska.gov/static/home/news/ongoingissues/pdfs/2014-May-FINAL-REPORT-DataSupplement-economic-importance-Alaska-wildlife.pdf to access the full report.

Wood Bison Update
Catherine Harms, Regional Program Manager with ADF&G in Fairbanks, reported that wood bison reintroduction has "transitioned from glacier speed over the past 20+ years to light speed since August 5, 2014". A 29-member team representing local communities, regional population centers, landowners, Alaska Native interests, wildlife conservation interests, industry, and State and Federal agencies prepared a draft of the Wood Bison Management Plan for presentation to the Federal Subsistence Board (January 2015). The same plan will be presented to the Board of Game in February 2015. During March/April 2015 (weather dependent), approximately 100 bison will be loaded onto C-130 cargo planes and flown to Shageluk, about 350 miles west of Anchorage. Animals will be held in pens until conditions are optimal for release, and a trail of feeding stations will guide released bison for 5 miles or more to higher-elevation habitat to avoid problems associated with fairly common spring floods in the area. Staff are investigating the possibility of barging another two dozen large bulls to the area from Nenana after breakup. Intensive monitoring of the bison will extend for a couple years, and hunting may eventually be prescribed when there is a harvestable surplus (possibly in 3-5 years).

Optimizing Detection of Grizzly and Polar Bear Dens using Drones
Nils Pedersen, a new M.S. graduate student in the Biology and Wildlife Department at UAF, will begin a proof-of-concept study during February 2015 that seeks to use an Unmanned Aircraft System (i.e., drone) equipped with a thermal infrared camera to test, refine, and optimize techniques for detecting grizzly and polar bears dens on the North Slope of Alaska. His research attempts to benefit multiple stakeholders (e.g., industry, agency, and tribal) by enhancing a tool that may mitigate negative human-bear interactions and create more opportunities for exploring bear denning ecology.

Hunting and Trapping in National Preserves
The National Park Service (NPS) issued a Proposed Rule document in September 2014 (http://www.regulations.gov/#!documentDetail;D=NPS-2014-0004-0001) that is receiving considerable comments (112,670 as of Feb. 1, 2015). The NPS proposes to amend its regulations for sport hunting and trapping in National Preserves in Alaska.
This proposed rule would not adopt state laws or regulations that authorize taking of wildlife, hunting or trapping activities, or management actions involving predator reduction efforts with the intent or potential to alter or manipulate natural predator-prey dynamics and associated natural ecological processes to increase harvest of ungulates by humans. The rule would maintain long-standing prohibited sport hunting and trapping practices; update procedures for closing an area or restricting an activity in NPS areas in Alaska; update obsolete subsistence regulations; prohibit obstructing persons engaged in lawful hunting or trapping; and authorize use of native species as bait for fishing. The end date for comments was February 15, 2015.

Western Arctic and Teshekpuk Caribou Herds in Decline
The 2013 photocensus for the Western Actic and Teshekpuk caribou herds estimated continued declines in population size. ADF&G has submitted an agenda

change request to the Board of Game (BOG), who have agreed to take the issue up at their March meeting. ADF&G has initiated efforts to prepare a feasibility assessment for intensive management. Harvest reductions also are being considered, and if reductions were to be implemented for the Teshekpuk caribou herd, it would be the first of such an action in over 30 years.

Fencing and Wildlife near Delta Junction
Darren Bruning, ADF&G Delta Junction Area Wildlife Biologist, reported that ADF&G and the Natural Resource Conservation Service are collaborating to investigate and address issues relating to fencing and wildlife. The impact of fencing on wildlife is a relatively new issue in Interior Alaska, and discussions are currently focused on fence design, placement, and consideration of wildlife movements prior to construction.

Bowhead Whale Longevity and Singing
Dr. Craig George, Senior Wildlife Biologist with the North Slope Borough Department of Wildlife Management in Barrow, reported that the human medical community has become very interested in recent research on changes in bowhead whale genes related to cell cycle, DNA repair, cancer, and aging (http://www.sciencedirect.com/science/article/pii/S2211124714010195). Dr. George also highlighted recent research that used hydrophones near Point Barrow to record bowhead whales songs (http://onlinelibrary.wiley.com/doi/10.1111/mms.12196/abstract). The study identified a repertoire of at least 12 unique songs sung by 32 individuals during 95 hours of recording.

Dall Sheep Hunting
At the request of the BOG, a survey of Dall sheep hunters, guides, and transporters was recently completed to provide more information on 1) hunter perceptions of crowding, 2) levels of satisfaction or dissatisfaction with current sheep management and regulations, and 3) approval or disapproval of potential changes to address hunter crowding and conflict (http://www.adfg.alaska.gov/static/home/library/pdfs/wildlife/mgt_rpts/14_sheep_hunter_survey_report.pdf). Additionally, ADF&G provided a summary of trends in sheep populations, harvest, and allocation since the 1970s (http://www.adfg.alaska.gov/static/home/library/pdfs/wildlife/mgt_rpts/14_sheep_report_bog.pdf). The BOG will consider this information when they address sheep proposals at the February and March meetings in Wasilla and Anchorage, respectively.

Kumi Rattenbury, Ecologist with the NPS in Fairbanks, reported that a spring 2014 survey on Dall sheep numbers in the western Brooks Range estimated a ~70% decline in total sheep numbers since 2011. In addition, the survey estimated very low lamb production and survival. The population decline resulted in an emergency closure of 2014 hunts in the area, and the BOG and Federal Subsistence Board will be considering an extension of hunt closures at upcoming meetings.

Obama Administration Moves to Protect Arctic National Wildlife Refuge
President Obama recommended to congress the largest ever wildness designation, the highest level of protection available to public lands. For more information, visit: http://www.doi.gov/news/video/thisweekjan30.cfm

Southcentral

Nathan Svoboda, Southcentral Representative

Personnel Changes
Dr. Courtney Amundson was recently hired as a permanent Research Wildlife Biologist with the USGS Alaska Science Center. Courtney received her M.S. and Ph.D. from the University of Minnesota where she studied the role of predator removal and density-dependence on mallard production in North

Dakota, and the impacts of parasites on the survival of American Coots. Courtney will lead species demography and distribution modeling efforts for the USGS Changing Arctic Ecosystems Initiative and also new work on pollinators and parasites in Alaska.

Dr. Dan Ruthrauff was recently hired as a permanent Research Wildlife Biologist with the USGS Alaska Science Center. Dan received an M.S. degree in Wildlife Management from Humboldt State University and recently completed his Ph.D. at the University of Groningen in The Netherlands. His Ph.D. focused on the energetic and physiological constraints faced by Rock Sandpipers in Cook Inlet, the most northerly wintering site for a shorebird in the Pacific Basin. Dan will lead the Alaska Science Center's Shorebird Ecology Program.

Tom Cady has been hired from Tongass National Forest as the new Deputy Refuge Manager. Tom earned his Bachelor's Degree from Humbolt State University and a Master's Degree from North Carolina State University. His background is in fisheries biology, and he is currently the manager of the Fisheries, Watershed, Wildlife, and Subsistence program for two ranger districts on Prince of Wales Island. He will begin in his new position February 8, 2015.

Susan Savage, Wildlife Biologist, retired effective Dec. 31, 2014, but is continuing to volunteer into the summer to complete outstanding projects and help provide for a smooth transition. Susan worked for 17 years as the refuges' avian biologist, accomplishing a remarkable breadth and depth of work with landbirds, shorebirds, seabirds, raptors, waterfowl and game birds on the two refuges. She has contributed a lasting legacy to the refuges, to Southwest Alaska, and to the state as a whole.

Melissa Cady has been selected as the new Avian Biologist, filling behind Susan Savage. Melissa earned her Bachelor's Degree from Hendrix College and a Master's Degree from Colorado State University. She has many years of experience as a wildlife biologist, working primarily with birds. She is currently a Wildlife Biologist with Tongass National Forest, and will begin with the refuge on February 8, 2015.

Sara Longson was recently hired as the new ADF&G wildlife biologist in Fairbanks and will be working with the ADF&G state veterinarian and the Animal Health and Disease Surveillance Program. Sara comes from ADFG Sport Fish division in Homer and her background includes a B.S. in biology (2003) from Northeastern University in Boston. Sara is also a Certified Veterinary Technician with extensive experience in veterinary private practice with anesthesia, dentistry and managing controlled substance records.

Cara Staab is leaving Alaska and the BLM so her husband can once again live and play in elk country. She appeased him as long as she could with fantastic Alaskan adventures in caribou and moose hunting, but alas, distant bugles continued to lure him so now she must go. Cara will be the Wildlife Ecologist for the USFS Northern Region in Missoula, Montana. Cara's departure opens a phenomenal opportunity for another biologist to lead BLM's Wildlife and Threatened & Endangered Species programs across 75 million acres of the Great Land. Call Cara before March 4th if you are interested in knowing more, or watch USA Jobs this spring.

Grant Hilderbrand recieves Award for Professional Excellence in Natural Resources

Excerpt from announcement of Director's Awards for Natural Resources: "Grant Hilderbrand has raised the professional operating level of the entire Alaska Region in the area of wildlife management and research. In particular, Grant completed a major effort this year to further wildlife stewardship. He published a paper "Wildlife Stewardship in the Alaska Region," which provides defensible guidance to the directorate, superintendents, and park professionals in the area of wildlife management - the most effective guidance for parks since ANILCA and immediately applicable. Grant has published management-relevant research, lead park-level research, and has provided unprecedented mentorship to the wildlife professionals in the Alaska region." Congratulations Grant!

State Legislature Update
On January 21, 2015 the state house introduced house bill HB70 and referred it to the Resources Committee. HB70 would add lands to the Creamer's Field Migratory Waterfowl Refuge (http://www.legis.state.ak.us/PDF/29/Bills/HB0070A.PDF).
Also on January 21, 2015, the state house introduced house joint resolution no. 7, opposing the proposed designation of an Aleutian Island National Marine Sanctuary (http://www.legis.state.ak.us/PDF/29/Bills/HJR007A.PDF).

U.S. Forest Service Update - The New Year means many of the Forest Service field offices are getting ready for the upcoming field season, reviewing hiring packets and checking supplies. It also means gearing up for spring migration and our associated birding festivals, including:

- The Alaska Hummingbird Festival in Ketchikan during the Month of April;
- The Stikine River Birding Festival in Wrangell - April 30 – May 3, 2015;
- The 25th Annual Copper River Delta Shorebird Festival in Cordova - May 7 – 10, 2015; and
- The Yakutat Tern Festival in Yakutat - May 28 - 31, 2015.

Nationally, the Forest Service is experiencing numerous retirements which is creating many diverse promotional opportunities, including some locally. More information can be found at https://www.usajobs.gov/

The 33rd Annual Native American Fish and Wildlife Society National Conference, will be May 20-22, 2015 and will be sponsored by the NAFWS Alaska Region. It will be held in Juneau, AK at Centennial Hall.

The Forest Service is revising the Chugach National Forest Land Management Plan, which includes a roadless area evaluation, under the 2012 Planning Rule. For more information visit: http://www.fs.usda.gov/detail/chugach/home/?cid=stelprdb5408185

Southeast

Kevin White, Southeast Representative

Personnel Changes
ADF&G Wildlife Biologist **Ryan Scott** recently transitioned from the regional management coordinator to the regional supervisor position. ADF&G Assistant Area Biologist **Stephanie Sell** was promoted to the Area Biologist position (formerly held by Ryan Scott). ADF&G Wildlife Technician and graduate student **Carl Koch** was recently promoted to the Assistant Area Biologist position (formerly held by Stephanie Sell).

Kristian Larson was hired in December 2014 as a new Wildlife Biologist I, and will assist with ongoing ADF&G predator-prey research projects. He is based in Ketchikan and has worked for the Division of Wildlife Conservation since 2010 on a variety of projects including using live-capture and non-invasive sampling methods to study wolves and black bears.

Deborah Rudis retired in March 2014 from the U.S. Fish & Wildlife Service Ecological Services office in Juneau where she was the Contaminants Biologist for the past 25 years. Deb's first work in Alaska was on the *Exxon Valdez* oil spill and included numerous other oil spills over the years, including the *Deepwater Horizon* spill in the Gulf of Mexico. Much of her work focused on mining issues in southeast Alaska, and contaminants on National Wildlife Refuge lands, particularly in the Aleutians. Deb will be staying in Juneau and doing some part-time consulting work when she is not enjoying hiking, skiing, running, sea kayaking, or traveling.

ADF&G Regional Supervisor **Doug Larsen** retired on Halloween in 2014 (dressed appropriately in pajamas during his last day of work). Doug had a long and accomplished tenure at ADF&G that included serving as the Director and Assistant Director of the Division of Wildlife Conservation, Regional Supervisor for the southeast Alaska region, and as a management biologist in the Kotzebue and Ketchikan area offices.

Doug is planning to remain in Juneau and continues to stay involved with TWS-Alaska Chapter activities.

Urban Black Bear Management
ADF&G is working with Waste Management to implement Kodiak garbage cans in black bear "hot spots" this spring to test effectiveness on discouraging nuisance bears from human attractants. They hope to transition from the current cans, which are not bear resistant, to cans that are either resistant or bear proof.

Alexander Archipelago Wolf
On August 10, 2011, the U.S. Fish & Wildlife Service (Service) received a petition from the Center for Biological Diversity and Greenpeace requesting that the Alexander Archipelago wolf (*Canis lupus ligoni*) be listed under the Endangered Species Act. On March 31, 2014, USFWS announced a 90-day finding stating that the petition included substantial information indicating that listing may be warranted. On September 22, as part of legal negotiations associated with the multi-district legislation settlement, the Service agreed to publish a 12-month finding on or before December 31, 2015, explaining whether or not listing is warranted. Shortly thereafter, the Service initiated a status review of the Alexander Archipelago wolf that will be completed in time to inform the listing decision. If you have information to assist in the review or questions regarding the process, please contact **Drew Crane**, U.S. Fish & Wildlife Service Alaska Region Endangered Species Coordinator, by phone at 907-786-3323 or email at drew_crane@fws.gov

Use of electrical weapons for human-bear conflict resolution
Since 2009, ADF&G biologists **Phil Mooney**, **Larry Lewis,** and **Neil Barten** have utilized electrical weapons (CEWs – aka. "tasers") for hazing and aversive conditioning of wildlife, primarily brown bears. Initial stages of the work focused on developing functional improvements for the devices and proficiency of their use to improve field application and effectiveness. Subsequent field work allowed ADF&G to expand the program to Armstrong–Keta fish hatchery staff at Port Armstrong on southern Baranof Island. During the height of summer spawning as many as 30-35 brown bears concentrate near the weir to feed on salmon. Since 2010, ADF&G staff have exposed more than 200 brown bears to the CEW devices, resulting in a 100% flight response. In 2013, ADF&G approved a trial permit, the first of its kind, to allow trained hatchery staff to use CEWs to haze and aversively condition brown bears. The Armstrong hatchery has not had a Defense of Life and Property bear kill since the CEW program began in 2010.

Upcoming Meeting - Forest Road Use

The **Alaska Society of American Foresters** will be holding its annual meeting in **Fairbanks from March 25-27, 2015**. On Thursday 26th, Chapter member Tom Paragi will moderate the session, "Public use of state forest roads: who pays for construction and maintenance?" Forest roads to enable silvicultural practices are permitted under the federal Clean Water Act to less stringent standards for some parameters than public roads due to lower expected traffic volume. Public uses of forest roads (e.g., for hunting) can increase maintenance needs in certain soil types and seasonal periods and may jeopardize the silvicultural exemption, thus requiring far greater construction and maintenance costs. The session will include technical presentations and a panel discussion on engineering and fish and wildlife habitat considerations, then policy statements and a panel discussion with agency, governmental, and public access group officials. The session will end with scoping of potential solutions for maintaining public uses and forestry practices. Contact james.schwarber@alaska.gov for registration information.

Student Chapter News- Rutting Moose, Chili, and Hunter ED

Photo: Adam Haberski

During the fall semester, the University of Alaska-Fairbanks Student Chapter of The Wildlife Society welcomed new members, and continued to establish traditions for the Chapter. To kick off the semester, the Chapter headed to Denali National Park and Preserve to observe moose behaviors during rut. This annual event is a fantastic way for the Chapter to bond, and to draw new members excited about being a part of TWS. After a night of camping, members hiked into the park to look for moose. Using spotting scopes, they were able to observe a few harems in the distance, and they were also fortunate to see bull moose displaying dominance just off the Park road.

Members learn how to use firearms safely in the Alaska Department of Fish and Game's Hunter Education course, part of the HIT program. *Photo: Adam Haberski*

In late October, the Chapter hosted its second annual chili fundraiser. The event is becoming a UAF favorite. This year the chapter partnered with UAF's Reindeer Research program, which provided reindeer meat for the chili.

In November, the Alaska Department of Fish and Game provided a hunter education course for the chapter. This is a great opportunity for new members to meet some of the fantastic people at ADFG, and to earn hunter saftey certification.

The Student Chapter is looking forward to continuing their kestrel nest box monitoring project this spring, and hopefully establishing a new long-term research project with the help of ADFG. Several members have been working on travel grant proposals to present their research in Juneau this Spring at the Annual TWS Alaska Chapter Meeting

Look for us on Facebook!

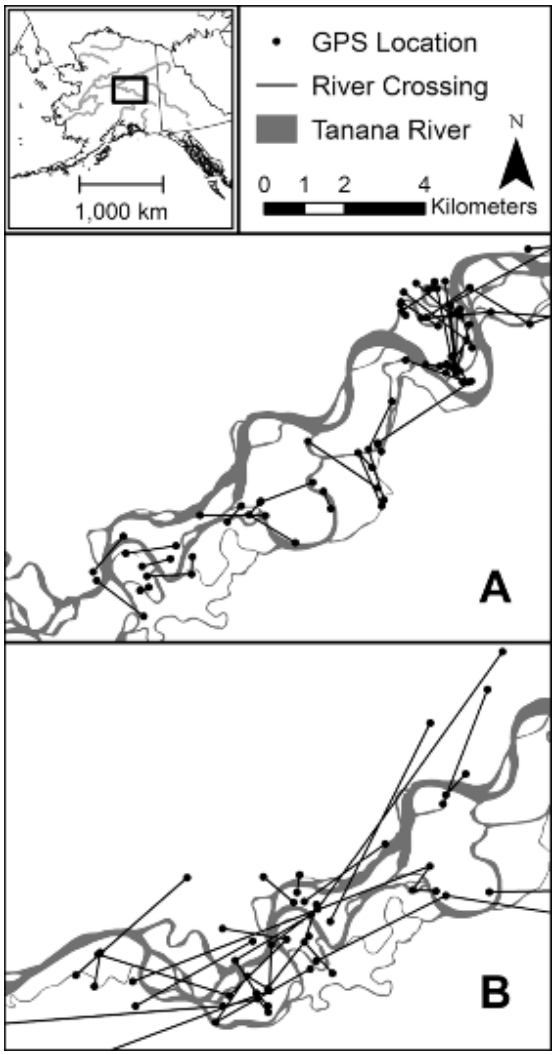
You can now "like" us on Facebook. On our new Facebook page, we are posting information on scientific publications relevant to Alaska's wildlife, announcements of upcoming meetings, and job openings. If you have ideas on how we can most effectively use our Facebook page, contact the Executive Board through the Chapter email: twsalaska@gmail.com

Cool Cats

By Knut Kielland and Dashiell Feierabend, UAF

We collected location data from Canada Lynx equipped with GPS collars on a 5-h fix schedule between December 2009 and January 2013. Of the 10 animals whose data spanned at least one month, two lynx made crossings of the Tanana River when it was frozen in April, one male crossed the main channel twice in two days when the river was still open in October, and another male crossed the main channel 6 times in November when the river was only partially frozen. One male and one female lynx, however, repeatedly crossed the river during freeze-up between September and November as their home ranges spanned the river. Some crossings occurred at night and both lynx also swam the main channel twice within a 24-hour period. The male made 14 crossings of the main channel of the Tanana River between 4 September and 4 November 2011, and he swam across smaller river braids and sloughs (15-50 m in width) an additional 20 times. The female made 11 crossings of the main river channel between 13 September and 21 November (when air temperatures were as low as -27°C), and she swam across smaller river braids and sloughs an additional 40 times. Based on swimming speed of humans and the displacement effect of the current (2 m/s) we estimated that the animals would spend 4-10 minutes crossing the main channel of the Tanana River, depending on channel configuration. These observations suggest that even hazardous rivers in freezing conditions may not represent significant barriers to highly mobile mesocarnivores such as Canada Lynx, and foraging movements as well as dispersal may include river crossings under such conditions

Dash Feierabend with the male lynx captured in Bonanza Creek 2011. *Photo: Knut Kielland*



Movement across the Tanana River during freeze-up near Fairbanks, Alaska (65° N, −148° W), by a female (A) and a male (B) Canada lynx equipped with GPS collars. Lines connect consecutive GPS locations for Canada Lynx on either side of the river but do not indicate the actual routes traveled

Reference

Feierabend D. and K. Kielland. 2014. Multiple crossings of a large glacial river by Canada Lynx (*Lynx canadensis*). Canadian Field-Naturalist 128:80-83

Woverines - Behind the Myth

By Riley Woodford, ADF&G

The wolverine's reputation precedes it. In Mark Trail's Book of Animals, Ed Dodd writes: "Savage ferocity combined with mischievous cunning has made the wolverine an object of hate and dread among trappers." In Mammals of North America, Vic Cahalane recounts the legendary prowess of the wolverine as fact: immensely strong and known to drive bears and mountain lions off their kills (two or three at a time, even); capable of taking down a bear in a fight; and bad-tempered loners that will destroy a cabin out of sheer deviltry.

Fact and Fiction

Alaska Department of Fish and Game researchers Howard Golden and Mike Harrington are studying wolverines in South-central Alaska. In recent years they've captured 18 wolverines and equipped them with GPS tracking collars to better understand their movements and numbers. Wolverines are impressive, but much of the reputation is exaggerated. "They've got such a bad rap," Harrington said. "I've had people ask, 'will they chase you down? Aren't they dangerous?' People wonder if we're afraid of them."

"A lot of myths about them are way overblown," Golden said. "People attribute magic powers to them, but they're just doing their thing, looking for food. They are curious, smart animals and they figure stuff out pretty quick. They are smart enough to run down a trap line, and that'll make trappers mad. But it makes sense that they'd do that – there's always food on these trap lines. They're not extra aggressive, they avoid trouble."

Wolverines are weasels, Golden said, and have the weasel nature. "That whole family is pretty similar, just the size is different. Ermine can be bold; weasels are an intelligent family of animals and they know how to survive." While wolverines are usually solitary, the "bad tempered loner" stereotype gives the impression they are downright antisocial. Golden visited a facility in Washington that's home to about 40 wolverines. They shared a large common area and he said they were quite tolerant and social with each other.

"If resources are limited, that can cause conflict, but they can be social," Golden said. "If food is plentiful, they've got no reason to worry about each other. We've seen them in April from the air, wrestling and playing with each other, they weren't fighting, they're socializing." They are territorial in the general sense of the word, but Harrington and Golden use the term "home use area" to describe the area they favor.

Mike Harrington holds a young female wolverine. Wolverines are sexually dimorphic, i.e., males are about 30 percent larger than females - 30 to 40 pounds compared to females in the 20 to 25 pound range. This female, CWF006 has a blue ear tag and was pregnant when she was caught on March 7, 2012. In this picture she had just been recaptured to retrieve her collar and is about to be released

"They pick areas they maintain and keep to themselves, males will overlap with females, but males don't overlap much with males, or females with females," Harrington said. "They need resources, and they pick an area where they can make a living and survive."

They have scent glands, a ventral gland near the belly button, anal glands, and little scent glands on the bottom of the pads of their feet, and when they walk they leave scent. Wolverines also scent-mark through urination. "They basically maintain territory this way through active marking," Golden said. "We have found some that have been in fights and are scarred up, they do get into tussles." He said a wolverine can defend itself pretty well, but it's no match for larger predators. "Two wolves can kill one," he said. "You hear stories about them chasing bears off, I've never seen that happen, or known anyone who has."

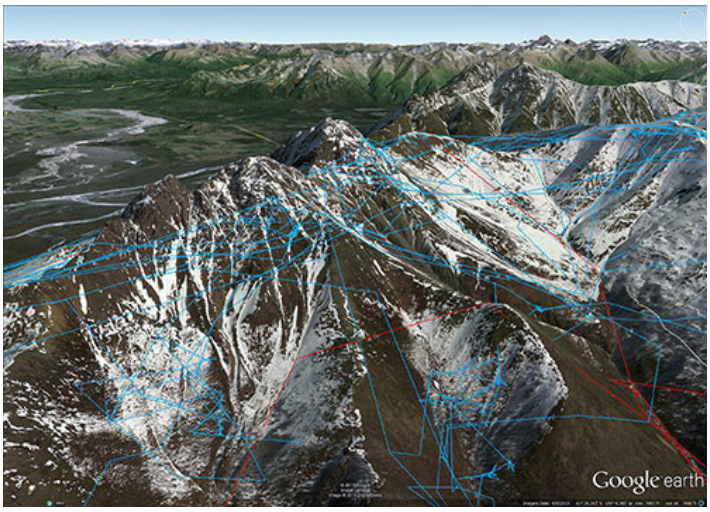
Their eyesight and hearing are not especially good, but they have an outstanding sense of smell. "They've got a pretty good set of tools on them; a really good nose, they can smell food over long distances or buried well under the snow," Golden said. "They can climb trees. They have a really warm coat. They've got strong claws for digging and defense, and incredibly strong jaws for biting and crushing bone and frozen meat - not the same crushing power as a wolf, but they're not as big, a big wolverine is 40 pounds and small wolf is 60 pounds."

"You look at them, they're mostly built for scavenging," Golden said. "But they're very opportunistic and regularly kill small game. They're not as fast as wolves, and they don't work in packs, but they can be more predator than scavenger if the situation allows for it."

Wolverines hunt snowshoe hares and voles, and in summer, ground squirrels and marmots are important prey items. "We've got documentation of them killing smaller Dall sheep. In Scandinavian countries they lose domestic sheep and reindeer to wolverines, and the government provides compensation to herders. The herders are required to hire rangers to document wolverine den sites and reproduction, and that's one reason they have great reproductive data."

It is true that wolverines are very strong for their size and have incredible stamina. Golden said a wolverine can cover 30 miles in a night, working a circuit in search of food. They will den up and rest for brief periods, and then get back on the move. That ability to travel through incredibly rugged mountainous terrain is not exaggerated.

"That's the big thing to come out of the GPS work for Mike and I, and it's pretty amazing when you see it," Golden said. "We get locations every 20 minutes, you can see how fast they move around terrain, they go up and down really steep, icy, rocky slopes like they're not even there. You could never hike it – you'd need climbing gear. It's like they see the world as two-dimensional, the way they move up and down these snow-covered slopes."



Movements of two wolverines through high elevation areas of the rugged Chugach Mountains. CWM006 is a male, and the red line shows his movements between his capture and collaring Feb. 21, 2013, and his last transmission March 26, 2013. The blue line shows the movements of female CWF008, captured March 2, 2013, and her last transmission June 12, 2013 (about a three-month period).

Tracks in the snow

An innovative technique to assess population size has partly driven the research. ADF&G biometrician Earl Becker developed a method to estimate wolf populations based on aerial surveys of tracks in snow. Called SUPE, Sample Unit Probability Estimator, Becker worked out the technique for wolves and he worked with Golden and Harrington to apply it to wolverines. Given some basic assumptions, it works like this: biologists survey an area after fresh snowfall and identify sets of tracks. Track lines can then be extrapolated to population numbers. Some basic assumptions must be met, for example, all animals of interest move during the study, tracks are continuous, they're recognizable from the air, and pre- and post-snowstorm tracks can be distinguished.

Wolverines behave differently from wolves, and they don't run in packs. Another important difference is that a wolverine may sometimes sit tight for two or three days, in a den site or on a kill, and that needs to be factored in. "For two or three days out of 20 they might not be moving, and if we did a SUPE at that time we might miss 10 or 15 percent that weren't moving after a fresh snowfall," Golden said. "That's a correction factor we need to apply to the calculated estimate."

"The other thing about SUPE, it only works in some areas," he added. "It wouldn't work in Southeast; the canopy cover is too thick. You have to meet that set of assumptions, and normally we can verify them while we're flying." Collaring and tracking wolverines allowed researchers to ground truth the technique – and learn a lot about wolverines in the process. Results indicated a density of 4.5 to 5.0 wolverines per 1,000 km2 in the Kenai Mountains and Turnagain Arm area, which is typical for other areas of South-Central where SUPES were conducted.

"Different techniques are suitable for certain areas," Golden said. "In some areas you're just looking for occupancy – do we even have wolverines?" The researchers pointed out two other methods used to study wolverines. Hair snares subtly snag a tuft of fur from a passing animal, and DNA in the follicles enables biologists to identify individual animals, their gender and relatedness, and multiple samples over time can provide an abundance estimate (mark-recapture). In addition, photo identification uses remote, motion-triggered trail cameras to photograph animals in specific poses to reveal distinctive markings that can identify individuals – much as tail fluke marks are used to identify humpback whales.

Catching wolverines: traps and darts

The researchers captured 18 different wolverines between September 2007 and March 2014. Including recaptures, animals were live-trapped 14 times and helicopter-darted 10 times. Among the 18 wolverines captured, there were five juvenile (1–2 years old) females, five adult females, four juvenile males, and four adult males. Wolverines were captured in Chugach State Park east of Anchorage, on the Elmendorf-Richardson joint base (JBER), and south of Anchorage in the Kenai Mountains.

Howard Golden fits a collar on a captured wolverine.
Photo: Isabelle Thibault

Three wolverines did not yield data – they slipped their collars right away, or for other reasons researchers were unable to detect their signals. All telemetry work was done in late winter and early spring to better understand how wolverines move during the period when SUPES

are conducted. Cameras proved to be a valuable tool for trapping and darting. Motion-triggered trail cameras were set up near live traps, and researchers wore helmet-mounted video cameras when helicopter darting to help them learn from capture attempts. That helped them solve an equipment malfunction at one point in the project – they slowed the video down and watched it frame by frame, revealing a problem with the dart design they were able to correct.

Darting can be very efficient under ideal conditions. For example, Golden said one day they caught four wolverines. That was exceptional, as some days they found wolverines they couldn't catch. Aircraft would search for roaming wolverines, and would then call the capture team. "Wolverines are never very abundant, even when they're abundant for the species," Golden said. "You need good conditions to track them; we had two fixed-wing aircraft just looking for animals, sometimes for hours, and then we're sitting on a ridge with the helicopter, waiting. Then we get the call and go after them."

Darting a moving animal from a moving helicopter is clearly a challenge. Harrington said the mountainous terrain and relatively small size of the target added to the difficulty. However, one thing played to their advantage. He said when pursued, wolverines tended to run uphill. In deep snow that really hampered their speed. "On hard packed snow, we couldn't believe how fast they can run," he said. Pursuit was limited to 10 minutes. "Sometimes we had to say, 'we're not going to get this guy.'"

Once caught, wolverines were quickly processed, throughout which, biologists monitored the wolverines' temperature, heart rate and respiration, and were prepared to provide supplemental oxygen if needed. They took samples of tissue (for DNA), hair, and blood, the animals were also weighed and measured, age was estimated, and they were marked with an ear tag and equipped with a GPS/VHF collar.

The collars were programmed to record GPS locations at 20-min intervals, and were capable of maintaining that rate of data collection for about 3 months and then continue VHF beaconing for an additional 100 days before battery failure. Collars also stored elevation and air temperature data. Two types of GPS collars were used; both stored thousands of location data points onboard and allowed remote downloading of collar data from either the ground or air. One model could be remotely signaled to drop-off; the other could not, and required recapture to retrieve collars.

Golden and Harrington were successful live-trapping on JBER during the first two or three years while new animals were still coming into trapsites. The researchers also took advantage of a winter moose hunting season on JBER - wolverines were attracted to kill sites and worked the hunt areas into their foraging circuits. However, it became very difficult to attract wolverines into traps during winter of 2012–13, which they attributed mostly to the lack of new wolverines visiting the area. From images gathered on the remote cameras, it seemed the animals were too wary to be caught. "They remember where they've found food, but they got wise to the traps really quick," Harrington said. "They're hard to live trap in the first place, and really hard after that. You might fool them once, but how do you fool them again after that? We got creative with different kinds of bait - we tried chickens wrapped in bacon, and big wads of beef suet."

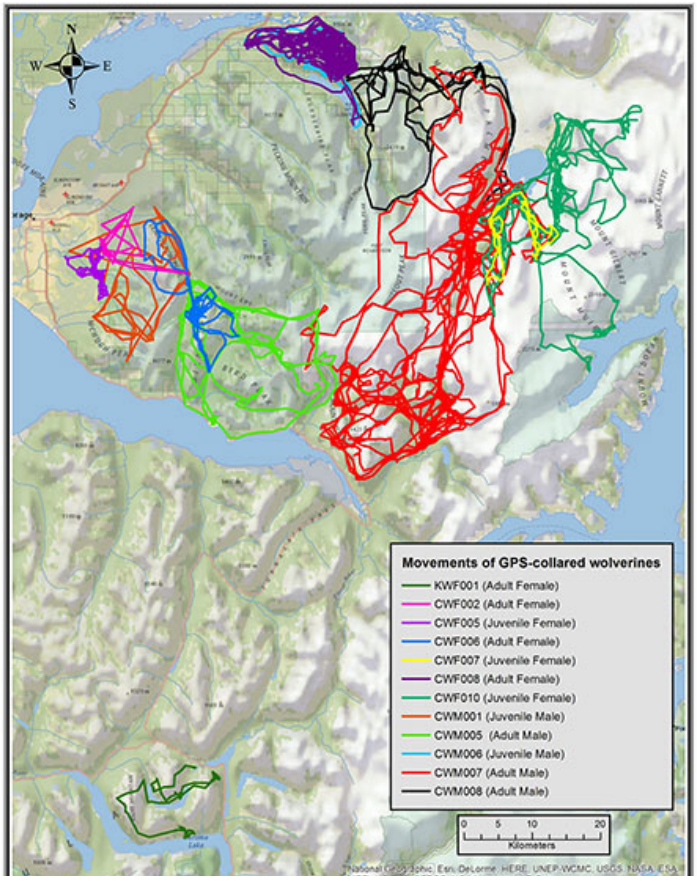
Wide ranging

DO YOU HAVE AN AVERAGE HOME RANGE SIZE FOR MALES AND FEMALES, BASED ON THE 15 COLLARED WOLVERINES?

Males and females traveled extensively throughout their home use areas. Both sexes occasionally went on exploratory trips and then returned to their primary areas. A look at the movements of five wolverines over the course of a year (two females and three males) showed great variation in distances

traveled; some days they covered a lot of ground, others days not so much. The average distances traveled per day were about 12 kilometers for the females, and between eight and 21 kilometers for the males.

"One male had twice as big an area as other wolverines," Golden said. "It may be that area had lost a male and this animal just took over the whole area, at least for the short time the collar was active." Because the focus of the study was movement in late winter and spring, the researchers did not track wolverines year-round. The far ranging male



Movements of 11 wolverines in the Chugach Mountains east of Anchorage, and one wolverine on the Kenai Peninsula further south. Turnagain Arm is at center left. Adult male CWM007 is depicted in red and has a home area roughly twice the size of other wolverines. Note the movements of the male CWM006 and female CWF008 as shown on the other map of high elevation mountain tops.

did provide some data in late spring – when he expanded his range even more. "They do spend a lot of time in summer during the breeding season testing boundaries and trying to encounter females," he said.

An important time in a wolverine's life, and a time for significant movement, is when a young adult strikes out to establish its own home range. Wolverines are born in February or March, two to four kits that usually dwindle from mortality to one or two by fall. "Mortality is pretty high for kits," Golden said. "We're finding females generally don't have a litter before they're about three years old, and then typically have a litter about every other year."

The kits are essentially full grown by October or November and begin moving out. It can be tough for a young wolverine to find territory that is unoccupied and suitable. "A daughter might stay with mom a couple years and inherit her area," Golden said. "Young may try and stay relatively close to their natal area, and siblings may be more tolerant of each other." But wolverines have been known to disperse as far as 235 miles. Dispersal is important, that's how wild areas that "produce" wolverines can supply them to potential home ranges elsewhere: good habitat where wolverines may have been harvested.

That balance is a model for sustainable yield – enough refugia from human activity and good habitat for wolverines that are producing young that will emigrate out. Hunters and trappers in Alaska harvest about 550 wolverines each year. Because wolverine reproductive potential and survivorship is low it's important to understand where and when animals are harvested to be sure the population is not overharvested. Wolverines disperse depending on availability of food and habitat resources, and animals dispersing from areas where they are not harvested, replenish the population in areas where they are hunted and trapped.

CALL FOR PAPERS AND POSTERS

Annual Meeting of The

Alaska Chapter of The Wildlife Society

April 13 - April 17, 2015

Juneau, Alaska

You are invited to the joint meeting of the Alaska Chapter of The Wildlife Society and the Northern Furbearer Conference. Please consider submitting an abstract for poster or oral presentation. Abstracts should be wildlife-related and focus on biology, science, management, education or policy. Meeting information and abstract submission are available at: **http://twsalaskameeting.com/current-conference/call-for-papers/abstract-submissions/**.

Presentations:
Presentations from completed studies or significant results from ongoing work will be given highest priority. Acceptance of presentations of work in progress will depend on abstract quality and program space. Presentations and posters will be accepted based on technical merit and contribution to our knowledge of species, populations, communities, ecological processes, management practices, conservation initiatives, education models, or policy issues. However, meeting time and space is a limiting factor and we may not be able to accept all submissions.

Symposia:
The conference will include special symposia addressing Population and Landscape Genetics (Tania Lewis), Alpine Ecology and Management (Kevin White), and Current Topics in Marine Bird and Mammal Research in Alaska (Jamie Womble). If you are interested in presenting in one of these symposia please check the appropriate box on the online form, and contact the symposia organizers listed there.

Abstract Submission:
Abstracts for oral and poster presentations must be received by **11:59 pm 03/13/2015**. Abstracts received after this date will not be included in the program. You will receive an email receipt of your abstract. All presenters of papers and posters must register for the conference. Please contact twsalaska@gmail.com if you have any questions regarding online submissions. For any program-related questions, you may contact Scott Brainerd (scott.brainerd@alaska.gov) or Grant Hilderbrand (Grant_Hilderbrand@nps.gov).

Northern Furbearer Conference:
The conference will also include an entire day dedicated to northern furbearers. If you are interested in presenting for the Northern Furbearer Conference, please check the box on the online form and contact the Northern Furbearer Conference organizers (Howard Golden and Tom Jung).

Deadline for abstract submission: March 13, 2015

Annual Meeting

Alaska Chapter of The Wildlife Society

Juneau, AK

Monday, April 13

Juneau Arts & Culture Center (JACC), 350 Whittier Street #101, Hangar on the Wharf

	Workshop
	Building Resource Selection Models from Start to Finish
8:00 am – 12:00 pm:	Invited Speaker Session
12:00 pm – 1:00 pm:	Lunch
1:00 pm – 5:00 pm:	Case studies and discussions
6:00 pm – 10:00 pm:	Reception at the Hangar Ballroom (reserved) – cash bar and food

Tuesday, April 14

Juneau Arts & Culture Center (JACC), 350 Whittier Street #101

8:00 am – 8:15 am:	Welcome TWS President and Conference Chair
8:30 am – 10:00 am:	Plenary Session: Nexus of Policy and Science
10:00 am – 10:30 am:	Break
10:30 am – 12:00 pm:	Plenary Session: Nexus of Policy and Science
12:00 pm – 1:00 pm:	Lunch
1: 00 pm – 3:00 pm:	Special Session 1: Marine Mammals and Seabirds
3:00 pm – 3:30 pm:	Break
3:30 pm – 4:50 pm:	Special Session 1: Marine Mammals and Seabirds
4:50 pm – 5:00 pm:	Wrap up and announcements
6:00 pm – 10:00 pm:	Poster Session and Mixer (JACC) – self catered

Wednesday, April 15

Juneau Arts & Culture Center (JACC), 350 Whittier Street #101

8:00 am – 10:00 am:	Special Session 2: Alpine Ecology and Management
10:00 am – 10:30 am:	Break
10:30 am – 11:50 pm:	Special Session 3: Landscape and Population Genetics
11:50 pm – 12:00 pm:	Wrap up and announcements
12:00 pm – 1:30 pm:	Lunch/business meeting
1:30 pm – 3:00 pm:	General Session 1

Wednesday, April 15 - Continued

Juneau Arts & Culture Center (JACC), 350 Whittier Street #101

3:00 pm – 3:30 pm:	Break
3:30 pm – 4:50 pm:	General Session 2
4:50 pm – 5:00 pm:	Wrap up
6:00 pm – 10:00 pm:	Banquet (JACC – reserved) – ticketed and catered, cash bar Guest speaker Richard Carstensen and live music from Wild Kind

Thursday, April 16

Juneau Arts & Culture Center (JACC), 350 Whittier Street #101

All Day:	Northern Furbearer Conference

Friday, April 17

Juneau Arts & Culture Center (JACC), 350 Whittier Street #101, Hangar on the Wharf

All Day :	Workshop Non-invasive Methods for Monitoring Furbearers and Their Prey

Registration Open Soon!

For more information visit

http://twsalaskameeting.com/current-conference/

Student Travel Grant Opportunity

Alaska Chapter of The Wildlife Society

Annual Meeting

Juneau, 13-17 April 2015

The Alaska Chapter of The Wildlife Society (TWS) is offering student travel grants to attend the Chapter's Annual Meeting from April 13-15, 2015 at the Juneau Arts and Culture Center. The meeting will be held in conjunction with the Northern Furbearer Conference (April 16-17) providing participants the opportunity to attend both meetings. Travel grant applications must be received no later than C.O.B. February 27, 2015. Grant recipients will be selected on a competitive basis and notified in mid-March.

Selection Criteria:

- Full-time undergraduate and graduate students are eligible
- Student must be presenting a paper (poster or oral)
- Award amount will be prorated based on travel distance
    - Fairbanks (other northern region community) ≈ $600
    - Anchorage (other southcentral community) ≈ $450
    - Southeast (excluding Juneau) ≈ $300
    - Juneau ≈ All conference fees (e.g., registration, banquet) waived
- Approximately $3,000 in travel funds will be allocated

This grant will likely be less than actual expenses (airfare, lodging, meals, registration). The intent is to make it feasible for many students to travel, not to pay the entire cost for a few. Students are responsible for obtaining the balance needed, which may include using your own funds.

Application Guidelines:

Submission must include name, address, email, phone number, university affiliation, current level of study (undergraduate, graduate, post-graduate), title of poster or paper presentation along with the abstract (formatting guidelines at URL: http://twsalaskameeting.com/current-conference/call-for-papers/abstract-submissions/). Students should also include a short (100-200 word) statement articulating why they should be selected for the travel grant. Grant recipients will be required to accept or deny the travel award by March 27 to allow redistribution of funds if necessary.

Please email applications or direct questions to:

Nate Svoboda (nathan.svoboda@alaska.gov) or
Todd Brinkman (tjbrinkman@alaska.edu)

*Note: travel grant recipients may be asked to assist with miscellaneous meeting tasks.

Award Nominations

Alaska Chapter of The Wildlife Society

Annual Meeting

President Grant Hilderbrand has solicited volunteers to form an Awards Committee for the Alaska Chapter of The Wildlife Society to meet one of our purposes in recognizing professional excellence and conservation achievement. The committee consists of Layne Adams, Tom Paragi (chair), Dan Thompson, Kevin White, and Dave Yokel. The committee built on exploratory discussions after the 2014 annual meeting and a review of awards given by other chapters. It settled on the following structure and process:

Award categories with criteria suggesting appropriate recognition:

- Student Wildlife Conservation Award
  - Individual or team achievement in research or management
  - Distinguished service to the Alaska Chapter or UAF Student Chapter
- Wildlife Conservation Award
  - Outstanding professional achievement during the preceding five years by individual or team in research or management
  - Lifetime achievement for excellence in professional accomplishments over at least 20 years (may be received only once)
  - Distinguished service to Alaska Chapter
  - Distinguished service to students or young professionals
- [Humorous award: *name suggestions*?]-- good natured roasting for an embarrassing event presented at banquet as capstone event following invited speaker; recipient name and year are added to object that is re-awarded each year (e.g., Colorado Chapter has a "blown blunderbuss" award).

Nominations

- The nomination must be from current Alaska Chapter member(s) and be sent to the committee chair
- The nominee does not have to be a current or former Alaska Chapter member
- The nomination should fit on one side of a single page and include:
  - The name of person submitting and date
  - The name of the nominee with current and past conservation-related employment, and professional affiliations (as best known)
  - A brief description ($\leq$200 words) of achievements related to the award category
  - One letter of recommendation (1 page, 1 side) from another colleague or collaborator (who does not have to be a Chapter member) that includes the name of person making the recommendation and date
- The nomination period opens after the annual meeting and closes 1 month prior to the next annual meeting.

Please think of colleagues you consider deserving, and consider a nomination for one or more of the three categories (student wildlife conservation, wildlife conservation, humorous). Send nominations to **tom.paragi@alaska.gov** by **Friday 13 March**. Also suggest names (and an iconic item) for the humorous award!

Kenai Moose and the Funny River Fire

By Riley Woodford, ADF&G

The Funny River Fire - Alaska's biggest fire of the year - burned a huge swath of the Kenai Peninsula in the spring of 2014. The Alaska Department of Fish and Game is investigating how the fire may benefit moose in the area.

The Funny River Fire around May 22, 2014. The total burn area encompassed about 200,000 acres, creating a mosaic of burned, lightly burned, and unburned land. Photo: courtesy Alaska Division of Forestry

The Funny River Fire

More than 500 people were engaged in fighting the fire during the last weeks of May, as it burned through the Kenai National Wildlife Refuge and threatened the communities of Kasilof, Funny River, and Sterling. Conditions were ideal for the fire. By the time the human-caused fire was reduced to smoking ash, the burn had encompassed an area of almost 200,000 acres. Sue Rodman explains how and why the fire was so extensive.

"Most of the stands of black spruce in there were over 60 years old and they were prime for burning," she said. "They're 30 feet tall or more, they have limbs that go all the way to the ground, and the understory vegetation is cranberry and blueberry that burns really well." Rodman has a forestry background and works on landscape and fire-related projects for Fish and Game, sometimes using fire as a tool to enhance habitat in areas like the Alphabet Hills near Delta Junction. She said spruce are particularly flammable trees. "Spruce trees have less moisture in them when they're alive than most trees do when they're dead," she said. "You combine that low moisture content with the amount of volatile contents in the sap and needles, and they burn great."

Many trees are mostly water. Combined, the materials that make up the wood and bark weigh less than the water inside the tree. Rodman said the moisture-to-weight volume is 200-300 percent in most live trees; a cottonwood for example, is 300 percent, most of the tree's weight is water. In spruce the ratio is about 60 percent. During the summer of 2014, highly flammable spruce combined with three other factors: low humidity (20 percent), a dry wind from the north, and an abundance of dry grass. Rodman said in the wake of the Kenai Peninsula's spruce bark beetle epidemic in the mid-1990s, there are a lot of dead spruce trees and Calamagrostis grass, a tall, reedy grass that can burn well under the right conditions.

"Grass is what's called a 'fine fuel,'" she said. "These fuel types give up and receive moisture very quickly, like within an hour, so when humidity drops from a normal of 40 to 50 percent to 20 percent, they give up a lot of moisture." The fire ignited in the afternoon of May 19 on the south side of Funny River Road. Initially driven south by winds, it burned all the way to the north shore of Tustemena Lake. Following the initial run, it burned east toward the Kenai Mountains and north, where it briefly jumped the Kenai River. "It was a human-caused fire started in the grass, and it ran," she said.

Not a Moonscape

"You hear 200,000-plus acres burned and you picture a moonscape – it's not like that," said ADF&G wildlife biologist John Crouse. Crouse lives in Sterling, near the burn, and studies moose on the Kenai Peninsula. "The ground was still frozen in a lot of areas, and in some areas it just scorched the tops of trees. By July there was already green coming back."

The area is not all spruce forest – there are wetlands, and stands of cottonwood, aspen and birch. Those trees have much higher moisture content than spruce, and the landscape itself in some areas is wetter. "Because relative humidity is sensitive to depressions in the landscape, a lot of riverine or stream areas didn't burn," Rodman said. "So that's part of why we ended up with a mosaic. The 2009 Shanta Creek fire was in the middle of the Funny River Fire (area), and that modified the fire behavior. It created fire breaks; there were chunks of habitat that had already burned there."

Rodman said foresters are already seeing places where birch, aspen, willow, and other hardwoods are regenerating. "There are a lot of places that might not have burned very deep into the duff layer. And where it did, bare soil is receptive to reseeding. It looks like there is going to be a nice mosaic of regenerating forage for moose. Moose love fireweed," she said.

Aerial photo of the central Kenai burn area in the summer of 2014 showing a mix of burned and unburned land. Photo: Sue Rodman

Moose and the Kenai Peninsula

The landscape at the northern end of the Kenai Peninsula (north of the Kenai River) is quite different from the south (south of Tustemena Lake), and now there is a big burn in the center of the Kenai. Biologists have been comparing moose in different areas of the Kenai, and the burn provides a new opportunity.

John Crouse is the director of the Kenai Moose Research Center near Sterling. He's working with ADF&G colleagues Thomas McDonough and Dan Thompson to learn more about moose on the Kenai. They are particularly interested in the recruitment of young moose into the population and how the population is growing. "For the past three years we've had 100 moose with VHF collars north and south of the burn," Crouse said. "We're tracking them to learn more about their health, birth rates, and survival, relative to the existing habitat conditions. On the north end of the Kenai, big burns in '47 and '69 really benefitted moose there."

The benefits are short term however, lasting perhaps a few decades after the fire. Crouse said the moose population has been declining in the north end of the Kenai (Game Management Unit 15a) since the early 1990s. The forest has matured and most of the food made available through past fires has now grown up and out of reach. "There is an interaction, they'll bend them over and break them, and that extends the benefit a bit, but eventually they get too big and tall for the moose to reach the available growth. Forty to sixty years post fire there's not much difference in food availability to moose between burned and unburned (plant) communities," Crouse said.

The south end of the Kenai (GMU 15C) is different, and so is the moose population. It's largely spruce and willow habitat, there is more variety in elevation, a more subalpine landscape, and a different fire history. The moose population there has been doing fairly well. Biologists are meeting management and harvest objectives, although there was some recent concern about bull:cow ratios. Around 2009, bull numbers had dropped to nine bulls per 100 cows, so managers reduced the harvest of young bulls. In recent years they've seen younger, breeding-age bulls recruited into

the population, and the ratio is up to 20:100.

Wildlife biologist Thomas McDonough is based in Homer, and serves as the principle investigator for Kenai moose studies. He said comparing moose in the north and the south ends of the Kenai provides insights into habitat quality. "We have 50 adult cows in each area with VHF collars," he said. "We capture a subset of them twice a year and assess their condition; in the fall, ostensibly at the peak of their condition after summer, then again in March when they're in relatively poor condition after the winter. Handling animals at both times of the year gives a really good measure of summer and winter habitat quality."
The work is related to a Board of Game directive to conduct predator control those areas of the Kenai. "These studies are giving some baseline information to help guide those programs," he said.

Moose in the Funny River Burn
"Now we have a 200,000 acre area impacted by a large burn in the middle of the Kenai," said Crouse. "With this (upcoming) collaring effort we hope to learn how moose are responding to the disturbance caused by the fire." Crouse and his colleagues will be busy in November – they plan to capture 100 moose as part of their studies. GPS collars will be deployed on 25 moose in the burn area, and 25 moose north of the burn. The collars will record the animals' location every 30 minutes and sensors on the collars will measure motion (acceleration) to allow biologists to determine activity associated with habitat use – e.g., was the animal bedded down or active and moving?

A collared cow moose with a mouthful of fireweed and her calf of the year. *Photo: Thomas McDonnough*

A subset of the animals will be equipped with a second monitoring device. Biologists plan to equip 30 moose with internal thermometers that will record and store body temperature every five minutes. Another 10 captive moose at the Kenai Moose Research Center will also be equipped with thermometers for comparison.

"We've got areas that are lightly burned, scorched, unburned, and severely burned within the perimeter," Crouse said. "How are moose using that fire landscape?" Researcher Dan Thompson will be looking at activity and location relative to the thermal environment, Crouse said. The fire opened up big areas that produce forage. However moose, being large bodied, respond negatively to high temperatures. Therefore, these areas may not be available to moose if they have to stand out in the sun in warm weather. When moose heat up, at some point they need to stop being active, or dissipate that body heat. They get in lakes, and may go into cooler habitat, such as black spruce forest with cool, moist moss understory, to lay down in the shade.

Thompson hopes to evaluate habitat use based on thermoregulatory costs to the moose. He'll have their locations, environmental temperatures, and the animals' internal temperatures. Captive animals at the Kenai Moose Research Center, equipped with the same devices, will help biologists interpret what the wild animals are doing. ADF&G is also looking at improving habitat in the north Kenai, creating fire breaks that will serve as a measure of safety for the public, and a swath of regenerating forage that's good moose food. In the summer of 2015, the U.S. Fish & Wildlife Service plans to conduct vegetation analysis on the Kenai National Wildlife Refuge within the burn area, and the Forest service is planning to set up vegetation plots as well, to better understand the regeneration process.

Management of the Tongass National Forest

By John Schoen

The Wildlife Society and six other scientific societies request the Forest Service end clearcutting old growth on the Tongass National Forest

On January 20, seven of the nation's top scientific societies, including The Wildlife Society, sent a letter to the Secretary of Agriculture requesting the Obama Administration to rapidly transition out of clearcutting old growth on the Tongass National Forest in southeast Alaska. USDA Secretary Tom Vilsack announced in July 2013, that a transition out of old-growth

logging into logging of second-growth forests would commence soon on the Tongass. Unfortunately, the Tongass Forest continues to support controversial old-growth logging sales (e.g., Big Thorne Timber Sale on Prince of Wales Island) at levels not seen since the 1990s, claiming that it needs to log old growth for another 10-15 years or more despite independent analyses that show second growth will soon be available to replace old growth to meet timber demand.

The scientific societies (representing thousands of scientists, include the Alaska Chapter of the American Fisheries Society, American Ornithologists' Union, American Society of Mammalogists, Ecological Society of America, Pacific Seabird Group, Society for Conservation Biology, and The Wildlife Society) are seeking an end to old-growth logging on the Tongass; the only national forest that still clearcuts old growth. In the last year, three separate letters from groups of scientists have also requested the Obama Administration end old growth clearcutting. These letters recognize that the Tongass has numerous ecosystem benefits including:

- One of the largest and most intact temperate rainforests in the world;
- A national champion in sequestering nearly 7 % of the nation's carbon on just 2 % of the nation's forest base, making it an ideal candidate for the President's climate change agenda;
- World-class salmon runs that are the backbone for thriving subsistence, commercial fishery, and recreation-based economies; and
- Providing essential habitat for many fish and wildlife populations (including 5 species of Pacific salmon, Sitka black-tailed deer, brown bear, black bear, marten, Southeast Archipelago wolf, Prince of Wales flying squirrel, Queen Charlotte goshawk, marbled murrelet, bald eagle, Franklin's spruce grouse, and many others including a number of endemic species).

"Protecting old-growth forest habitat on the Tongass is the key to maintaining the productivity and resilience of extraordinary fish and wildlife populations that have otherwise declined throughout their southern ranges in North America," said Grant Hilderbrand, President of the Alaska Chapter of The Wildlife Society. John Schoen, a retired Alaska biologist and TWS Fellow, said "Quickly transitioning the Tongass National Forest out of clearcutting valuable and irreplaceable old-growth forests is an administrative action that just makes common sense and would bring significant conservation, economic, and climate change benefits to the American people."

Malaspina Bears

By Riley Woodford, ADF&G

In the remote country west of Yakutat, coastal brown bears are fighting, foraging, and exploring a landscape that's still emerging from the ice age. Wildlife biologist Anthony Crupi and fellow ADF&G researcher Lavern Beier have captured 18 brown bears and equipped them with GPS radiocollars, providing researchers with insights into the bears' movements, resource needs, reproduction, and seasonal behaviors.

Alaska's border with the Yukon Territory runs 700-miles north to south, jogging east at the Malaspina Glacier and the Gulf of Alaska. That area, where the Southeast Alaska panhandle meets Southcentral Alaska, is virtually uninhabited; a rugged beach landscape of tide flats, wetlands, young forests, rising foothills, barren rock, and glaciers. In many places, trees are growing on glacial ice. "It's an amazing place to work," Crupi said. "I've seen grey whales 15 feet off the beach. Lots of marine life washes up, a dead sea lion, sharks, and skates." The west side of Yakutat Bay is part of Wrangell-St. Elias National Park and Preserve, and the National Park Service is cooperating in the study.

The Malaspina Forelands

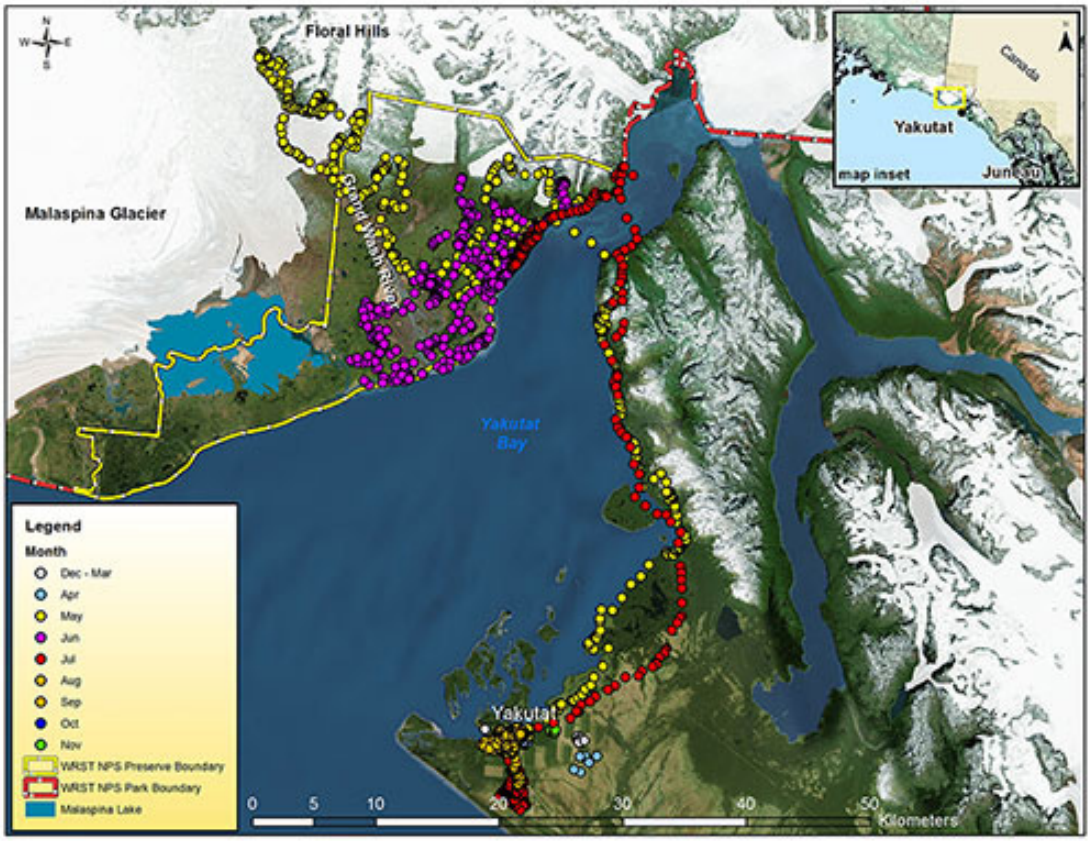
Researchers are studying bears southeast of Yakutat Bay as well. "The topography is completely different there," said Beier. "The Malaspina side of the bay is a moonscape compared to the Yakutat Forelands." The Yakutat Forelands are a lush contrast - old-growth forest crossed with innumerable salmon streams. Yakutat Bay and the small town of Yakutat sit between the two study areas. Ninety brown bears, and one

A big Malaspina bear

black bear, have been collared in the Yakutat Forelands and the Yakutat landfill study areas. It appears these are two separate populations of bears, with very little mixing between the Yakutat and Malaspina Forelands – although there is one notable exception.

One 6-year-old male bear was collared near the Yakutat city landfill. Over the course of a week, he traveled about 35 miles north along the eastern shore of Yakutat Bay to its head at Disenchantment Bay. At 2 am he plunged into iceberg-laden waters for a three-mile swim to the Malaspina Forelands where he spent two months traveling around and then swam back to Yakutat. "Why would he do that?" asked Beier. "Why would he leave all those abundant resources to go over there? You'd think it would be the other way around."

He died shortly after he returned. "We found his collar about 100 yards from where we collared him," Crupi said. "He was dead, a pile of fur and bones, we don't know what happened. But in the days of VHF collars (which only transmit a radio signal and don't store information) we would've thought he'd never left the area." The collar data revealed details of his sojourn. Logging temperature and a location point every 30 minutes, data shows the temperature on his collar dropped from 68 to 34 degrees at the end of his 90 minute swim. He hunkered down for a day of recuperation after the icy swim, then spent May and



A map showing the travels of Bear 722. Blue dots near the town of Yakutat (bottom center) indicate his location in April, yellow dots show his trek north in May, his swim across Disenchantment Bay at the head of Yakutat Bay, and his travels west across the forelands and up to the Floral Hills in the foothills of the Saint Elias Mountains. Purple dots show his locations in June around the forelands, and red, his trip back to Yakutat.

June – the mating season – exploring a 150-square-mile area along the southeast side of the Malaspina Glacier, moving from the coast to the foothills of the St. Elias Mountains and back.

"Not a lot of bears go to the high country," Crupi said. "But he spent the majority of May in high elevation sites." The Malaspina bears commonly prefer low elevation habitat that is a mosaic of colonizing forest, shrubs, kettle ponds, and riparian zones. Glaciers, ice, and salt water are generally barriers to movement, but not always. One bear collared on the Malaspina side, an 8-year-old male, spent a month circumnavigating the entire Malaspina Glacier, covering more than 130 miles. "He also spent a week in the high country," Crupi said. "Then he spent a week foraging at Point Riou (in Icy Bay) and in five days he traveled 60 miles back along the coast to where he began."

For the most part, bears stayed within a home range, traveling five or six kilometers a day in search of food - but that varies with the season. "We assumed females with cubs would have the smallest home range, and they do," Crupi said. "Sex and season are strong predictors of home range. Subadult males have the largest." On the Malaspina side, the average home range for a male bear is 2.5 times larger than that of female bears - 462 km2 (178 mi2) and 184 km2 (71 mi2), respectively.

In spring, females with cubs move less than 1 km a day while adult males are traveling about 5 km a day. In late summer, females with cubs are traveling more, about five km/day, and males about six km/day. "Home ranges are smallest for everyone in the spring and larger in late summer when they're looking for fish and strawberries," Crupi said. Wild strawberries are abundant on the coast in the area. Beier said at times in summer, the aroma of ripe beach strawberries was so strong he could smell them from the helicopter flying overhead.

The picture that's developing of what most bears usually do, has bears waking from hibernation in the spring and feeding on emerging, green vegetation. "Most come straight down to the flats at low elevation,

eating the first spring green up," Crupi said. "Females with cubs stay higher up and seek south-facing slopes with green up. They're avoiding other bears and not moving much."

The average date for den emergence is April 29, with a range of a few weeks. The average date for denning up is November 24. The bears in the Malaspina area seek out dens at about 155 m (500 ft) elevation. That's a striking contrast to brown bears in other areas. For example, Admiralty Island bears typically den several thousand feet above sea level, and bears in the Haines area den at about the 2,800-foot level on average. November 24 is also later than average for denning, which Beier attributes to late-season coho in area streams.

Crupi knows where the bears hibernate because the GPS collars tag the location. Location is logged every 20-30 minutes between April and November, however, to extend battery life when bears are hibernating, location points are logged just once a day from December through March. The collars also record temperature and activity every ten minutes. Movement triggers a mercury switch, and the number of times the switch moves in a 10-minute period is logged. "We can tell strenuous activity from mild activity," Crupi said. A burst of strenuous activity accompanied by a drastic temperature drop likely indicates a bear is fishing.

Collars are equipped with VHF radios, which transmit a location signal. A biologist with an antenna then homes in on the signal to locate a bear – or at least a collar. The signal changes if that collar doesn't move for six hours – known as a mortality signal. Some collars can periodically transmit data while others must be retrieved before the data can be downloaded. Collars are designed to "blow off" after a period of time so biologists can retrieve them, and all the collars in the Yakutat Forelands study area will release in 2015.

LaVern Beier with a Malaspina bear. Malaspina bears spend a lot of time scavenging on the beach, and many of the bears were caught on beaches. Footsnares were anchored to big beach logs, bears were snared, darted with an immobilizing drug, processed, collared, and released unharmed.

A burst of strenuous activity followed by no activity can indicate a fight to the death, and Crupi and Beier have investigated several of these. "We've found several collars torn off in bear fights," he said. "One collar was turned off after all this activity, and we found this big torn up area. No vegetation, all the trees were shredded. It gives you an eerie feeling."

"You can just imagine the scene," Beier said. "Some of the collars are just shredded; like a bear has figured out he can use it as a mouth-hold and grabs the collar. Some are torn lengthwise, or you see these big canine punctures. Strife amongst bears." Crupi said an 11-year-old female bear was killed and eaten in August, with just a pile of fur and a few bones remaining.

With the conclusion of this research project, Crupi and his colleagues have written up some of their findings in a paper: Movement patterns, home range size, and resource selection for brown bears near the Malaspina Glacier, Southeast Alaska. Crupi and his colleagues are still working on the study of the Yakutat Forelands/ Landfill bears.

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From May until October, participants will engage in a series of activities to develop and expand their leadership skills. Institute members will attend the TWS Annual Conference in Winnipeg, Manitoba, Canada (October 16-21, 2015) and participate in various activities, including mentoring and leadership workshop sessions. The Institute is free, and participants receive free registration and a travel grant for the conference.

Participation in the Institute is geared toward early-career professionals, individuals 2 to 3 years out of school (either undergraduate or graduate school), currently working full-time in a wildlife professional position, and with demonstrated evidence of their leadership potential. Also eligible are more recent graduates who have shown strong evidence of their leadership potential and those who are working while concurrently pursuing a graduate degree. All applicants must be dues-paying members of TWS and a Chapter or Section of TWS. The selection committee will be seeking to create a diverse group with participants of varying gender, ethnic, and regional diversity. Selection will be based upon:

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- Demonstrated leadership capability or potential
- Demonstrated level of excellence in current position
- Commitment to and involvement in TWS

Preference will be given to individuals who are certified as Associate Wildlife Biologists® or Certified Wildlife Biologists®, or who have submitted such an application to TWS.

Applicants must submit (in one PDF, excluding online application form and recommendation letters):

- Application form (available at http://wildlife.org/liapplication)
- Cover letter with evidence of leadership capacity or potential, such as previous leadership positions held in TWS Chapters or Student Chapters or in other organizations
- Résumé including a list of publications, awards, etc.
- Academic transcript/s
- 2 letters of recommendation from supervisors, academic advisors, professors, or others in leadership positions with whom you have worked and who are familiar with your leadership potential, commitment to TWS, and commitment to wildlife management and conservation
    - Letters should be emailed directly to leadership@wildlife.org, subject line "Leadership Institute Recommendation for [applicant last name]"
- An essay (1000 word limit), which succinctly summarizes (1) your concept of leadership, (2) your aspiration for your role within TWS in 5 to 10 years, and (3) why you are an ideal candidate for the Institute

Application deadline is March 27, 2015. Email all materials (except the application form, which is submitted online) in one PDF to: leadership@wildlife.org Visit www.wildlife.org for more information (click on 'Next Generation').

Goodbye to a Colleague and Friend: Fred Dean

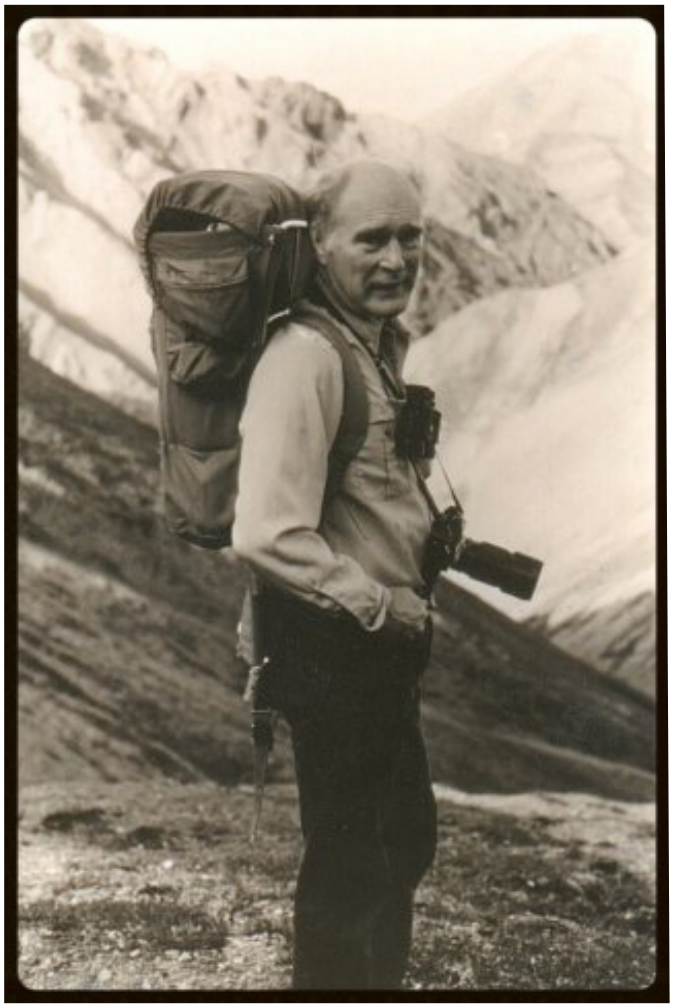
By Tom Paragi and Harry Reynolds ADF&G

Former students, colleagues, and friends were saddened by the passing of Frederick Chamerlain Dean on November 28, 2014 at his home in Fairbanks after a short illness. He is survived by his wife Sue, sons Jeffrey and Stephen, and grandchildren Tehben, Jebarri, and M'fanwy Dean.

Fred was professor emeritus of wildlife management at the University of Alaska Fairbanks. He had been head of the Department of Wildlife Management and assistant leader of the Alaska Cooperative Wildlife Research Unit from 1954 to 1973 before serving as program leader of the Cooperative Park Studies Unit from 1972 to 1983. Fred continued mentoring students as an adjunct professor of wildlife management from 1983 to 1990. He was major advisor for 30 graduate students and served on the committees of more than 40 others. He was also editor of the Biological Papers of the University of Alaska from 1955 through 1974 and served on the editorial board for several additional years. Colleagues and students recognized that Fred's stalwart administrative duties in the early years of the department facilitated the work of many others at the expense of time on his own research.

Fred was born in Brookline, Massachusetts on May 22, 1927 and graduated from Putney School, Vermont in 1945. Fred's early interest in the natural world was nurtured by his summers as a camper and counselor at Camp Treetops in the Adirondacks. He served a year in the U.S. Navy before attending the University of Maine, Orono where he received a Bachelor of Science in 1950 and a Master of Science in 1952. He met his wife, Sue, when they were students at the University of Michigan Biological Station in 1949. Fred received his doctorate in forest zoology in 1957 from State University of New York, College of Forestry, Syracuse. His family still has the wood and canvas canoe he used for both his graduate projects.

Fred's research in Alaska was varied but generally focused in national parks. His chief research focus was on the grizzly bears of Mt. McKinley (now Denali) National Park, where he worked many summers starting in 1957, from the East Fork research cabin with graduate students. An early colleague of his in bear research in the park was the late Adolph Murie. He also led a biological survey of the Baird and Schwatka mountains in 1963, and conducted research on humpback whales in Glacier Bay in the 1970s and 1980s.



Outside of academia, Fred was a founding member of the Alaska Conservation Society and served as president more than once. He joined the Alaska Chapter TWS soon after its formation and regularly attended its annual meetings. After retirement, he became the founding president of the board of the Alaska Boreal Forest Council (1996 to 2006) and co-authored an extensive bibliography on riparian forest ecology. During 2002-2014,

Fred Dean - Continued

Fred chaired the Bear Research and Conservation Grants Committee of the International Association for Bear Research and Management (IBA). Fred worked hard to maintain a committee structure of bear biologists from around the world and developed a transparent and fair system for distributing these funds to students and researchers. Grants went to research and conservation projects on all 8 species of bears across 34 countries, primarily in the developing world where there are no research and management agencies responsible for bear conservation. Under his leadership, 118 grants were awarded, mostly for $5000 to $9000, for a 13-year total of $688,243. The innovative studies completed with the support of these grants have brought about a scientific understanding of bear biology and habitat requirements that would not have been otherwise possible. Fred received the 2010 President's Award from IBA and was only the third person to have received the Distinguished Service Award (2014) since the IBA was founded in 1968.

At his memorial service in Fairbanks, many former students spoke warmly and tearfully of the dedication this quiet, kind, and patient teacher had for students. Over the decades, Fred and Sue have welcomed young biologists into their home and shared many meals with former students who found their way back for a visit. In one instance typical of Fred's nature, a particularly shy student recounted her arrival in Fairbanks, a little bewildered by her move to Alaska. Fred warmly met her at the airport, brought her to his family's cabin, welcomed her stay there until she found a place to live, and enabled her to settle into a new life as a graduate student. In addition to his other fine qualities, Fred's skill as a caller for square and contra dances was remembered, along with humorous stories of life in Fairbanks when his children were growing up.

Julia Bevins can accept memorial donations to the charity for which Fred worked so diligently, the Bear Conservation Fund, at 3303 Checkmate Drive, Anchorage, AK 99508 or online at www.bearbiology.com/index.php?id=bcfgive.

Opportunities with the U.S. Forest Service in Cordova, Alaska

Detail or temporary promotion for the Administrative Support Assistant GS-0303-06/07
Closes February 18, 2015
Primary Contact: Nancy O'Brien
Respond to: nobrien@fs.fed.us
Phone Number: (907) 424-4722

Permanent Seasonal Biological Science Technician (Wildlife) GS-0404-07
Closes February 20, 2015
Primary Contact: Erin Cooper
Email: ecooper@fs.fed.us
Phone Number: (907) 424-4757

Permanent full time Fish Biologist (PWSZ Aquatic Staff) GS-0482-11
Closes February 27, 2015
Primary Contact: Robert Skorkowsky
Phone: (907) 424-4747
Email: rskorkowsky@fs.fed.us

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New memberships and renewals are available on-line at The Wildlife Society (www.wildlife.org/alaska/). Click on membership to obtain membership forms.

Recent Publications by TWS - AK Chapter Members

We would like to highlight the contributions of Chapter members to wildlife science. If you or your colleagues have recently published articles in peer-reviewed journals, please send the citation to Jerry Hupp (jhupp@usgs.gov). The following are some papers that were recently published by Chapter members.

Bean, W.T., L.R. Prugh, R. Stafford, H.S. Butterfield, M. Westfall, and J.S. Brashares. 2014. Species distribution models of an endangered rodent offer incomplete measures of habitat quality at multiple scales. Journal of Applied Ecology 51:1116-1125

Bentzen, R.L., and A.N. Powell. 2015. Dispersal, movements and site-fidelity of post-fledging king eiders *Somateria spectabilis* and their attendant females. Ibis 157:133-147.

Borg, B., S.M. Brainerd, T.J. Meir, and L.R. Prugh. 2015. Impacts of breeder loss on social structure, reproduction and population growth in a social canid. Journal of Animal Ecology 84:177-188.

Brinkman, T., K.B. Maracle, J. Kelly, M. Vandyke, A. Firmin, and A. Springsteen. 2014. Impact of fuel costs on high-latitude subsistence activities. Ecology and Society 19:1-10.

Carrasco, S.E., B.B. Chomel, V.A. Gill, A.M. Doroff, M.A. Miller, K.A. Burek-Huntington, R.W. Kasten, B.A. Byren, T. Goldstein, and J.A.K. Mazet. 2014. *Bartonella* spp. exposure in northern and southern sea otters in Alaska and California. Vector Borne & Zoonotic Diseases 14:831-838.

Colson, K.E., K.H. Mager, and K.J. Hundermark. 2014. Reindeer introgression and the population genetics of caribou in southwestern Alaska. Journal of Heredity 105:585-596.

Ely, C.R., W.J.L. Sladen, H.M. Wilson, S.E. Savage, K.M. Sowl, B. Henry, M. Schwitters, and J. Snowden. 2014. Delineation of tundra swan *Cygnus c. columbianus* populations in North America: geographic boundaries and interchange. Wildfowl 64:132-147.

Fox, A.D., P.L. Flint, W.L. Hohman, and J.-P. L. Savard. Waterfowl habitat use and selection during the remigial moult period in the Northern Hemisphere.

Gilbert, S.L., M.S. Lindberg, K.J. Hundertmark, and D.K. Person. 2014. Dead before detection: addressing the effects of left truncation on survival estimation and ecological inference for neonates. Methods in Ecology and Evolution 5:992-1001.

Glad, T., P. Barboza, R.I. Mackie, A.-D.G. Wright, L. Brusetti, S.D. Mathiesen, and M.A. Sundset. Dietary supplementation of usnic acid, an antimicrobial compound in lichens, does not affect rumen bacterial diversity or density in reindeer. Current Microbiology 68:724-728.

Handel, C.M., and C. Van Hemert. 2015. Environmental contaminants and chromosomal damage associated with beak deformities in a resident North American passerine. Environmental Toxicology and Chemistry. 34:314-327.

Jochum, K.A., A.A. Kliskey, K.J. Hundertmark, and L.N. Alessa. 2014. Integrating complexity in the management of human-wildlife encounters. Global Environmental Change 26:73-86.

Kissling, M.L., P.M. Lukacs, S.M. Gende, and S.B. Lewis. 2015. Multi-state mark-recapture model to estimate survival of a dispersed-nesting seabird, the Kittlitz's murrelet. Journal of Wildlife Management 79:20-31.

Krebs, C.J., J. Bryant, K. Kielland, M. O'Donoghue, F. Doyle, S. Carriere, D. DiFolco, N. Berg, R. Boonstra, S. Boutin, A.J. Kenney, D.G. Reid, K. Bodony, J. Putera, H.K. Timm, T. Burke, J.A.K. Maier, and H. Golden. 2014. What factors determine cyclic amplitude in the snowshoe hare (*Lepus americanus*) cycle? Canadian Journal of Zoology 92:1039:1049.

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Lewis, T.L., M.S. Lindberg, J.A. Schmutz, M.R.

Publications - Continued

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Matsuoka, S.M., C.L. Mahon, C.M. Handel, P. Sólymos, E.M. Bayne, P.C. Fontaine, and C.J. Ralph. 2014. Reviving common standards in point-count surveys for broad inference across studies. Condor 116:599-608.

McGrew, A. K., L. R. Ballweber, S. K. Moses, C. A. Stricker, K. B. Beckmen, M. D. Salman, and T. M. O'Hara .2014. Mercury in gray wolves (*Canis lupus*) in Alaska: Increased exposure through consumption of marine prey. Science of the Total Environment 468-469.

Niedzialkowska, M., K.J. Hundertmark, B. Jedrzejewska, et al. 2014. Spatial structure in European moose (*Alces alces*): genetic data reveal a complex population history. Journal of Biogeography 41:2173-2184.

Prugh, L.R., and C.D. Golden. 2014. Does moonlight increase predation risk? Meta-analysis reveals divergent responses of nocturnal mammals to lunar cycles. Journal of Animal Ecology 83:504-514.

Richard, J., K. White, and S. Côté. 2014. Mating effort and space use of an alpine ungulate during the rut. Behavioral Ecology and Sociobiology 68:1639-1649.

Savory, G.A., C.M. Hunter, M.J. Wooller, and D.M. O'Brien. 2014. Anthropogenic food use and diet overlap between red foxes (*Vulpes vulpes*) and arctic foxes (*Vulpes lagopus*) in Prudhoe Bay, Alaska. Canadian Journal of Zoology 92:657-664.

Shimada, T., N.M. Yamaguchi, N. Hijikata, E. Hiraoka, J.W. Hupp, P.L. Flint, K. Tokita, G. Fujita, K. Uchida, F. Sato, M. Kurechi, J.M. Pearce, and A.M. Ramey. 2014. Satellite tracking of migrating whooper swans *Cygnus cygnus* wintering in Japan. Ornithological Science 13:67-75.

Schürch, A.C., D. Schipper, M. A. Bijl, J. Dau, K.B. Beckmen, C. M.E. Schapendonk, V.S. Raj, A.D.M.E. Osterhaus, B.L. Haagmans, M. Tryland, and S.L. Smits. 2014. Metagenomic survey for viruses in Western Arctic caribou, Alaska, through iterative assembly of taxonomic units. PLOS ONE DOI: 10.1371/journal.pone.0105227

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Thompson, D. P., and P. S. Barboza. 2014. Nutritional implications of increased shrub cover for caribou in the Arctic. Canadian Journal of Zoology 92:339–351.

Uher-Koch, B.D., D. Esler, R.D. Dickson, J.W. Hupp, J.R. Evanson, E.M. Anderson, J. Barrett, and J.A. Schmutz. 2014. Survival of surf scoters and white-winged scoters during remigial molt. Journal of Wildlife Management 78:1189-1197.

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Wilson, R.R., D.D. Gustine, and K. Joly. 2014. Evaluating potential effects of an industrial road on winter habitat of caribou in north-central Alaska. Arctic 67:472-483.

Woldstad, T.M. K. N. Dullen, K. J. Hundertmark, and K.B. Beckmen. 2014. Evaluation of *Trichodectes canis* (Phthiraptera: Trichodectidae) detection methods in Alaskan gray wolves. International Journal for Parasitology: Parasites and Wildlife 3:239-241 DOI: 10.1016/j.ijppaw.2014.08.002.

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