



ISSUE
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PEACE/WILLISTON FISH & WILDLIFE COMPENSATION PROGRAM

Arctic grayling research takes big step forward at first-ever conference

Research into the preservation and restoration of Arctic grayling took a big step forward this year at a first-ever conference in B.C. on this fish, which is threatened in many areas of North America.

About 70 biologists gathered in Prince George on February 18 to 20 to share information and focus on how to evaluate, preserve and restore grayling populations.

“The conference has opened up lines of communication between groups doing similar kinds of research so that we can learn from each other’s experiences,” said Brian Blackman, senior fish biologist with the Peace/Williston Fish and Wildlife Compensation Program (PFWWCP), the main sponsor of the conference.

Biologists with PFWWCP are breaking new ground in their efforts to save Arctic grayling. Due to its declining numbers, the fish is “red listed” in the Williston Reservoir watershed, meaning it is vulnerable to extinction. In Montana, grayling have been reduced to about 4% of their original range and a number of populations have declined severely in Alberta.

Biologists at the conference came from B.C., Alberta, the Northwest Territories and Montana. “Each participating group had unique aspects to their programs and we all learned from each other’s experiences,” said Blackman. “Now we have to make sure that we keep communications flowing.”

Blackman explained that the results of scientific studies often take up to five years to be published and valuable material, if it is not scientifically conclusive, is often omitted. “Discussing common problems and possible solutions with other biologists can be extremely valuable and can save years of work,” he said.

In the Williston Reservoir watershed, the Ministry of Environment, Land and Parks (MELP) has instituted a catch and release only fishing regulation for Arctic grayling. MELP’s Habitat Protection Section closely monitors any industrial activities proposed near water bodies supporting Arctic grayling and local industry has supported the Habitat Section’s activities.

Biologists of the PFWWCP have used various methods to study the Arctic grayling’s life cycle, spawning habits and habitat requirements, including radio tracking devices, with the aim of developing a work plan to ensure the survival of the fish in the Williston Reservoir watershed.

In addition to the PFWWCP, the conference was sponsored by the Ministry of Environment, Lands and Parks, BC Fisheries, BC Hydro, Environmental Dynamics, Pacific Western Brewing Co., and Qualstar Solutions Inc.



Arctic grayling from Williston Reservoir watershed.

Inside...

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BRITISH COLUMBIA

Ministry of Environment, Lands and Parks
BC Fisheries

Natureline is published to inform community leaders, interest groups and the public about projects and initiatives undertaken by the Peace/Williston Fish and Wildlife Compensation Program.

The program is a joint initiative of BC Hydro, the Ministry of Environment, Lands and Parks and BC Fisheries. It is designed to enhance and conserve fish and wildlife in the watersheds of the Williston and Dinosaur reservoirs in north-central British Columbia.

In 1988, a \$10 million fund was established to support research and enhancement projects for fish and wildlife in the Williston Reservoir watershed. A further \$1 million was added later to fund fisheries projects in the Dinosaur Reservoir watershed between the W.A.C. Bennett and the Peace Canyon dams. The annual interest from this fund, now valued at \$23 million, is managed to maintain the Peace/Williston Fish and Wildlife Compensation Program in perpetuity.

This issue of Natureline deals with some of the projects currently being undertaken by the program. We invite you to forward any questions and comments on the Peace/Williston Fish and Wildlife compensation Program to Brian Blackman, senior fisheries biologist, or Mari Wood, senior wildlife biologist at:

Peace/Williston
Fish and Wildlife
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1011 4th Avenue
Prince George, B.C.
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Natureline

An update of our activities 1999/2000

wildlife **UPDATES**

Presentations

Three presentations on PWFWCP wildlife projects were delivered at the Wildlife Research Symposium held at UNBC in October. Mari Wood discussed winter tick loads on Stone's sheep, Fraser Corbould talked about habitat use of radio-collared fishers, and Pamela Hengeveld reported on recently conducted amphibian presence and distribution surveys. Mari Wood also delivered a lab session on wildlife capture, handling and radio-telemetry techniques for a UNBC Wildlife Ecology class.

Fisher habitat use project

Seven different fishers (2 males, 5 females) implanted with radio-transmitters were monitored to determine their seasonal habitat use, movements, home ranges, and den and resting site use this year. Habitat assessments to characterize sites that were used by fishers were conducted throughout the summer, and trapping was conducted in the fall. The final trapping session for the project will be conducted this March .

Mackenzie migratory songbird monitoring

Funding was provided to the Mackenzie Nature Observatory to assist with the banding of songbirds during the fall migratory season. Electrical power was also provided to the banding site in the summer.

Snow depth monitoring stations

Remote dataloggers containing information from the previous winter were retrieved from 6 locations throughout the Williston Reservoir watershed in spring 1999. Snow and temperature data were downloaded, and trends were graphed for each site. The stations were re-programmed and re-established at the same sites in the fall to collect information for the 1999/2000 winter.

Rocky Marsh wetland enhancement

Construction of an earthen dam to stabilize water levels at the wetland was completed in August 1999. In addition to the dam, a parking area was created, and nature trails were marked out for future development. The Mackenzie Boy Scouts assisted on the project by building an observation platform overlooking the marsh.

Newly created earthen dam with water control structure at Rocky Marsh wetland



line update

Nabesche mountain goats and mineral licks

In an attempt to increase the distribution of mountain goats in the Nabesche River drainage, sites were selected and salt blocks were placed at three control and 10 treatment locations. A Wildlife Habitat Area (WHA) proposal was developed for the Mount Brewster mineral lick, and submitted to the Ministry of Environment, Lands and Parks for review.

Neonatal ungulate selection

Wolves along the north side of the Peace Arm were captured and radio-collared this winter in order to identify what ungulate species they prey upon during the spring calving season. A female wolf from one pack was trapped and radio-collared in early January, but left the study area in February. In March, four additional wolves (two females from one pack, and two males from another) were captured on the Williston Reservoir ice using a helicopter and a net-gun, and fitted with radio-collars. The wolves will be monitored over a 2 year period, and home ranges and den sites will be located. Fecal material will be collected from den sites and analyzed to determine the species and relative abundance of newborn ungulates preyed upon in spring.

Waterfowl moulting surveys

Two surveys to identify waterfowl moulting areas along the Finlay and Parsnip foreshore, from the Williston Reservoir were conducted in July. Most moulting areas were located along the Parsnip Reach and the lower section of the Finlay Reach. The most common species observed was Canada geese (over 900 were observed on each survey). Eleven sandhill cranes (a blue-listed species) were also observed on each survey.

Amphibian surveys

The second and final year of reconnaissance-level amphibian surveys was conducted between May and July. Surveys were completed in the Beryl Prairie, Johnson Creek, Tacheeda Lakes, Table River, Curve Lake, and the upper Mesilinka and Ingenika river areas. All five species known to occur in the Williston Reservoir watershed were found: wood frog, spotted frog, striped chorus frog, western toad, and long-toed salamander.

Fish and wildlife species list

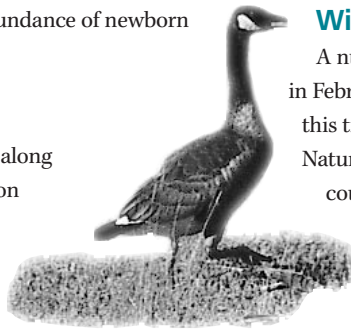
A brochure identifying the fish and wildlife species present within the Williston and Dinosaur reservoir watersheds was developed. The brochure, intended to be used by naturalists and fish and wildlife enthusiasts alike, lists what species are present, their abundance in the watershed (e.g. common, rare), and what habitats they may frequent. Copies of this brochure may be requested from the PFWWCP office in Prince George.

Ingenika River elk transplant monitoring

An inventory of Rocky Mountain elk in the Ingenika River drainage was conducted in February 2000; 50 elk had been released in the area four years earlier. Three groups totaling 34 elk were observed on the survey, including five of six radio-collared females (the sixth was not located within the survey area). Many elk were in dense timber making detection difficult, and two of the three groups (both with collared individuals) were located with the aid of radio-telemetry equipment.

Winter ungulate surveys

A number of ungulate (hoofed mammal) surveys were conducted in February and March 2000. Population estimates are not available at this time, however, results will be presented in the next issue of Natureline. These surveys included 1) a stratified random block count of Rocky Mountain elk residing both north and south of the Peace Arm of Williston Reservoir; 2) a survey of woodland caribou, Stone's sheep, and mountain goats using alpine habitats in the Pesika Creek, Akie River, and Kwadacha River drainages in the northern part of the watershed, and 3) a survey of Stone's sheep along the north side of the Peace Arm east of the Nabesche River.



Canada goose on grassy shoreline adjacent to reservoir, a feeding site used during moulting

Winter waterfowl surveys

Lakes and rivers in the southern portion of the Williston Reservoir watershed were surveyed in January and February to identify ice-free areas that may be important winter habitats for waterfowl, particularly trumpeter swans. Ice-free areas were located along the Crooked, Parsnip, and Nation River systems. Trumpeter swans (135), goldeneyes (180), mallards (40), and mergansers (19) were the most common waterfowl species observed. Many American dippers (68) were also viewed. Swans were most abundant along the Crooked River (118).

fish UPDATES

Dina Creek enhancement

Mackenzie high school students assisted PFWWCP biologists on stream maintenance in Dina Creek where sediment was removed from rearing pools, debris was removed from the streams, spawning gravel was cleaned, and the stream mouth was channeled. Project biologist also assisted with the annual Dina Creek field day where approximately 75 students from Mackenzie schools learned about water quality, stream habitat, and fish and invertebrate identification.

Gething Creek bull trout transplant/evaluation

Twenty-one bull trout were captured in Gething Creek and transplanted upstream above impassable falls. The area above the falls provides suitable spawning and rearing habitat for a potential resident bull trout population. Post-spawning bull trout were recaptured and returned to the reservoir. Evaluations conducted last summer found that bull trout fry from previous transplants have moved upstream into Wright Lake and that rainbow trout released into Wright Lake have moved downstream out of the lake into Gething Creek. Both species appear to be naturally reproducing in the streams and it is expected that both species may move downstream and contribute to the fishery in Dinosaur Reservoir.

Mesilinka fertilisation project

Liquid fertiliser (nitrogen and phosphorus) has been added to the Mesilinka River each year since 1994. The objective is to increase algae and insect production and thereby increasing the amount of food available to fish. Underwater fish counts have been conducted on a yearly basis and indications are that the fish populations in the fertilised areas are slowly increasing in numbers and that the fish are growing faster. Further evaluation of this project is on-going.

Dinosaur Reservoir

Twelve and a half thousand rainbow trout were released into Dinosaur Reservoir this year. An angling survey was also conducted on Dinosaur Reservoir to evaluate the effectiveness of the stocking program and to provide baseline data for future enhancement projects. In the past it was noted that a high percentage of fish released into Dinosaur Reservoir

moved downstream out of the reservoir, which resulted in low angler catch rates. It was assumed that this movement out of the reservoir was because of a lack of rearing habitat in the reservoir for smaller fish. In 1999,

test planting of cattails and sedges were undertaken in one small area of the reservoir to determine if an aquatic plant community could be established. More extensive planting trials will be undertaken this year. It is hoped that if aquatic plant communities can be established in several areas of the reservoir, this enhancement will provide rearing habitat and reduce fish movements out of Dinosaur Reservoir.

Kokanee classroom project

Students from three schools in Mackenzie, one in Hudson's Hope and one in Fort St. John participated in the Classroom Kokanee Rearing Project last year. The project provides students with hands-on experience raising kokanee from eggs to minnow-sized fry. In October/November last year, PFWWCP biologists Arne Langston and Randy Zemplak delivered kokanee eggs to participating classes and explained the program. In June the students released kokanee fry into Mugaha Creek and Cust Creek, both tributaries which flow into the Williston Reservoir.

In this annual event, the eggs/fish are reared in specially equipped aquariums set up by PFWWCP staff. The students gain an understanding of the fish life cycle, the dangers fish are exposed to, and the role fish play in the ecology of the reservoir. Other organizations assisting with this program include: the Department of Fisheries and Oceans, Habitat Conservation Trust Fund, Finlay Forest Industries (now Donohue Forest Products Inc.), Fletcher Challenge Canada, the Mackenzie Fish and Game Association, Canfor Ltd. (Chetwynd), the BC Hydro office at the W.A.C. Bennett Dam, the Lions Club of Hudson's Hope, and the Hudson's Hope Rod and Gun Club.

Arctic grayling genetics study

As part of the process to determine if Arctic grayling can be reintroduced back into streams historically inhabited by them, it is necessary to determine if the remaining populations are genetically distinct from each other or if all the remaining populations are similar. Investigation to date have not identified specific genetic markers that can be used to indicate separate stocks within the watershed. Further studies on this project are on-going.

Davis River bull trout project

Twenty-eight Davis River bull trout were implanted with radio transmitters and tracked throughout the spawning season. The main purpose of this project was to locate bull trout spawning areas and to determine what stream characteristics are selected by bull trout for spawning sites. Biologists also recorded water temperatures at eight sites, documented spawning sites, and determined the number and distribution of spawning bull trout in the stream.



Students from Hudson's Hope release kokanee raised from eggs in classroom, 1998.



Senior fish biologist Brian Blackman plants sedge grass in mudflat at Dinosaur Reservoir.

Tick infestation of stone's sheep to be investigated at 20 Mile Point



Released moments before this photograph was taken, a newly radio-collared Stone's sheep heads back to the safety of the cliffs above the Williston Reservoir.

A small herd of about 20 Stone's sheep winters at low elevation, about 700 metres, on 20 Mile Point, a set of cliffs adjacent to the north shore of the Peace Arm of Williston Reservoir. Mari Wood, senior wildlife biologist with the PFWWCP, notes that these sheep have been reported by biologists and the local public to exhibit severe hair loss in winter, which is likely a result of infestation with winter ticks.

"Winter ticks are external parasites that complete their life cycle by attaching to a single host animal in the fall," says Wood. "The ticks remain on the host until spring, when females drop to the ground to lay eggs." Wood says that heavy infestations of winter ticks can result in blood loss (ticks feed on blood), hair loss due to excessive grooming in trying to rid themselves of the ticks, and reduced time spent feeding due to increased amount of time spent grooming.

A project to investigate the extent and cause of the presumed tick infestation was initiated by the PFWWCP in 1999. The project objectives are to: 1) confirm that these sheep have winter ticks, 2) determine the extent to which winter ticks affect the overall health and productivity of the herd, 3) determine the cause of the tick problem (e.g., interactions with moose or elk, or self-perpetuated), and 4) investigate potential solutions to interrupt the tick cycle, if ticks are found to be affecting the health of the herd.

It was initially suggested that the 20 Mile Point sheep may be contracting winter ticks from moose displaced from the Peace River valley bottom by the Williston Reservoir. Moose are the most common ungulate host for ticks, carrying an average of about 35,000 ticks each. However, Wood notes that moose densities are relatively low along the north side of the Peace Arm, in contrast to the much higher densities of Rocky Mountain elk resulting in part from a successful transplant of 135 animals into the Dunlevy Creek area in the mid-1980's.

"A number of prescribed burns conducted throughout the 80's and 90's along the north shore of the Peace Arm have created favourable grassland conditions, and the elk have moved westward to colonize the entire north shore at least as far as the Nabesche drainage", says Wood. "Although elk are reported to carry substantially fewer ticks per individual than moose, the higher numbers of elk and their use of similar grassland habitats as sheep, likely places them in greater contact with the 20 Mile Point sheep." Thus the habitats and areas used by sheep, elk, and moose in the spring (the time when female ticks drop off their host to lay eggs) and fall (when tick larvae attach themselves to a passing host) is of critical importance in determining the cause and extent of the apparent tick problem in 20 Mile Point sheep.

This project was initiated in March 1999 with the capture and examination of six sheep from 20 Mile Point. Four sheep had hair loss and low to moderate numbers of winter ticks, while two sheep showed no hair loss or ticks. Eleven sheep on 20 Mile Point were captured and examined in March 2000; four were recaptures from the previous year. Two sheep had lots of winter ticks and exhibited extensive hair loss, while two others had no ticks and no hair loss. The remaining seven sheep had varying degrees of hair loss and numbers of winter ticks present. Five additional sheep wintering on alpine ridges 20-30 km away were captured and examined for comparative purposes; none of these sheep had winter ticks or hair loss. Five elk and five moose from the vicinity of 20 Mile Point will also be captured and examined. All captured ungulates will be radio-collared and monitored for two years (2000/01 and 2001/02) to determine their distribution and habitats used during spring and fall. Lamb production for collared Stone's sheep will also be investigated. In March 2001 and March 2002, collared sheep will be captured and re-examined to compare tick loads with areas and habitats used the previous fall. Wood will be presenting the results of the sheep capture and tick examinations at the biennial Northern Wild Sheep and Goat Symposium in Whitehorse, Yukon in June 2000. The final project findings will be presented at the 2002 symposium.

Blood-engorged female winter ticks (left) prior to drop-off from host in March; males (right) are much smaller.



Biologists identify mountain goat mineral licks

In the northern interior of BC, mountain goats typically inhabit high elevation, steep, rocky terrain year round, with the exception of visits to low elevation mineral licks during spring and early summer. Goats rely heavily on mineral licks in spring to replenish sodium (salt) reserves which are flushed from the body due to the intake of potassium-rich green spring forage.

Licks are most often located on flat benches and along rivers where minerals from higher elevations are carried and deposited by runoff. "Mineral licks are seldom close to secure escape terrain, and goats have been documented to travel several kilometres through forested habitats to reach these licks," says Mari Wood, senior wildlife biologist with the PWFWCP. "Usually, a single well-defined trail through the forest provides a direct route to the nearest escape terrain."

Goats are particularly sensitive to disturbance at lick sites. Consequently, with the increased access into remote drainages for extraction of forest resources, many lick sites and their forested access trails are at risk. The identification of mineral lick locations is therefore the first step in ensuring that these licks and their surrounding areas are properly managed. Wood also hopes this proactive approach will result in less review time for Forest Development Plans; the plans could also include measures to protect important mineral licks and trails.

Mountain goat mineral licks in the lower Ospika River drainage were

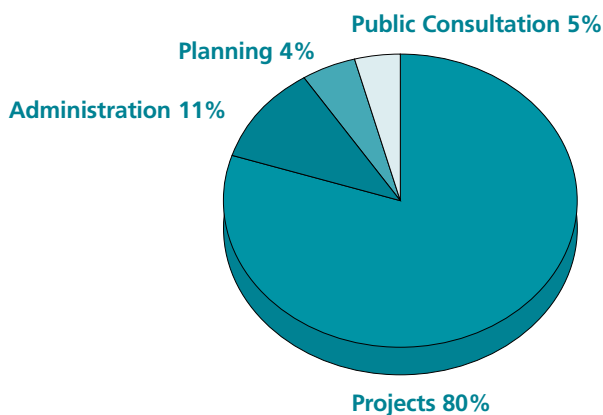
identified and investigated in October 99. Potential licks were identified from sites noted on habitat maps, and from a detailed review of clay bank locations on forest cover maps. Wood surveyed potential lick sites from the air using a helicopter; those sites with obvious goat use (determined by visible tracks/trails) were subjected to a thorough ground investigation. The degree of use and importance of each lick was classified according to the presence and abundance of goat sign (tracks, hair, scat, licking sites, forested access trails).

Sixteen lick sites were located during the survey along the Ospika River and its tributaries; all licks were found to be within clay banks. Ten of the 16 licks were rated as high or medium importance for mountain goats. "Some of the licks exhibited an abundance of goat signs from last spring's use," says Wood. "Extensive hair was found along the main forested access trails, and tracks and fecal material were plentiful." The goat lick project will be expanded in the summer of 2000 to identify, investigate, and rate mineral licks in the Clearwater, Nabesche, Finlay, Ingenika, and Mesilinka River drainages.

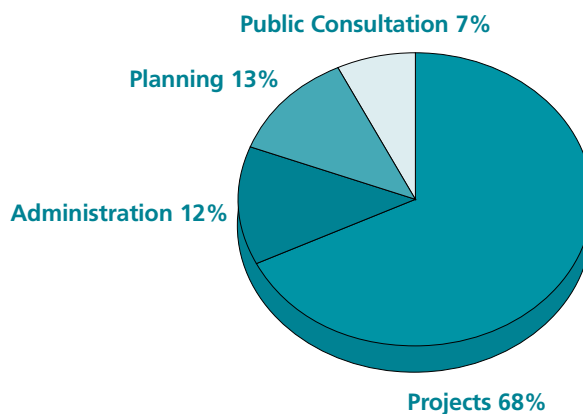


Mountain goat licks soil from claybank in spring to gain essential minerals.

Projected wildlife expenditures for 1999/2000: \$620,171



Projected fish expenditures for 1999/2000: \$591,262



Interested in knowing more about fish and wildlife research and enhancement activities in the Williston Reservoir watershed?

Try our web site at <http://www.bchydro.bc.ca/environment/initiatives/pwcp>

To be placed on the mailing list for the free newsletter *Natureline*, contact:
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