

Management Plan for Yukon Amphibians

2013

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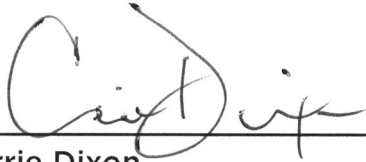
This management plan shall not create any commitments or obligations that are legally binding on the planning participants. Without limiting the generality of the foregoing, this management plan shall not create, affect, define, interpret, or apply any roles, responsibilities, or interests under Final or Self Government Agreements. The goals, objectives, and recommendations herein are subject to governmental priorities and budgetary constraints, as well as modifications necessary to accommodate new objectives or findings.

Cover photos by Cameron Eckert



Management Plan for Yukon Amphibians

Approved by

A handwritten signature in black ink, appearing to read 'Currie Dixon', written over a horizontal line.

Currie Dixon

Minister of Environment
Government of Yukon

Date Aug. 6, 2013

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Artwork by Lee Mennell

Why Develop a Management Plan for Amphibians?

Amphibians are threatened globally from environmental changes ranging from large-scale concerns such as climate change to smaller-scale habitat disturbances such as poor water quality. At present, 33% of amphibian species worldwide are threatened with 7% of these 33% on the brink of extinction (Stuart et al. 2004). They are regarded as good indicators of local environmental health as they are sensitive to small changes in local conditions (Stuart et al. 2004). In Yukon, amphibians garner a great deal of public curiosity and they are culturally important to many local First Nations.

Four species are found in Yukon (Slough and Mennell 2006; Figure 1): Western Toad (*Anaxyrus boreas*), Boreal Chorus Frog (*Pseudacris maculata*), Columbia Spotted Frog (*Rana luteiventris*), and Wood Frog (*Lithobates sylvaticus*). The Western Toad is currently listed as being of Special Concern under the federal *Species at Risk Act* (SARA). The Columbia Spotted Frog and Boreal Chorus Frog are locally rare and of conservation interest in Yukon. The Wood Frog is a wide-ranging species in Yukon. The conservation status and management needs of all four species of amphibians in Yukon are similar. This plan was developed to address the needs of all Yukon amphibians.

SARA legally requires the federal government to develop a management plan for the Western Toad due to this species being listed in Schedule 1 of that act as Special Concern. This assessment noted that the species has experienced population declines and extirpations in the southern parts of its range, including in British Columbia (COSEWIC 2012b). Initial discussions between jurisdictions with Western Toad populations and the federal government concluded that each jurisdiction within the Western Toad range would complete an individual management plan. Therefore, in 2009, Yukon government began planning for a Yukon-specific management plan that was sensitive to the territorial context, and would include all amphibian species present in the territory. The overall management goal for Western Toads and their habitat is to ensure that the species does not become Threatened or Endangered. While this plan provides a Yukon-specific approach to the management of Western Toads, management plans for other portions of the species' Canadian range may be prepared by other responsible jurisdictions (i.e., Canada, British Columbia, Alberta and Northwest Territories). The content of this plan is expected to be complementary to the anticipated federal management plan for the Western Toad in Canada.

Photo by Mike Dunn



Lake in the Liard Basin where Western Toads have been found.

Scope and Nature of the Management Plan

This management plan is intended to provide a broad framework to guide the management of Yukon amphibians. It recognizes that there is much that we do not know about Yukon amphibian populations such as trends in their abundance, distribution, limiting factors and threats. Additional suggested actions may be developed later as new information becomes available.

Planning Participants and Process

Environment Yukon hosted a workshop in Whitehorse in October 2009 to develop objectives and proposed recommendations for the management of amphibians in Yukon. A technical overview of the status of amphibians in Yukon was then completed and provided additional information for the planning process (Slough 2011). The final draft plan was provided to the Yukon Fish and Wildlife Management Board (YFWMB) in January 2013 for review and consideration. With a letter to the Minister of Environment, the YFWMB stated their support for approval of the plan in April 2013.

Distribution, Population & Legal Status of Yukon Amphibians

Within Yukon there is some uncertainty regarding the ranges of the Western Toad, Boreal Chorus Frog, and Columbia Spotted Frog and abundance information is based on expert opinion. Information on the distribution of Yukon amphibians is housed within a database of the Yukon Conservation Data Centre.

There is currently no information on amphibian population fluctuations or trends for Yukon, but two initiatives may provide information on trends in the future. First, Parks Canada initiated a Wood Frog monitoring program for monitoring the occupancy of 16 ponds in Kluane National Park and Reserve in 2008. Second, FrogWatch is part of the national NatureWatch suite of volunteer monitoring programs designed to help identify ecological changes that may be affecting our environment. To date, FrogWatch has not yet been successful in Yukon due to limited road access to amphibian breeding habitats and a small human population from which to draw “citizen scientists.”

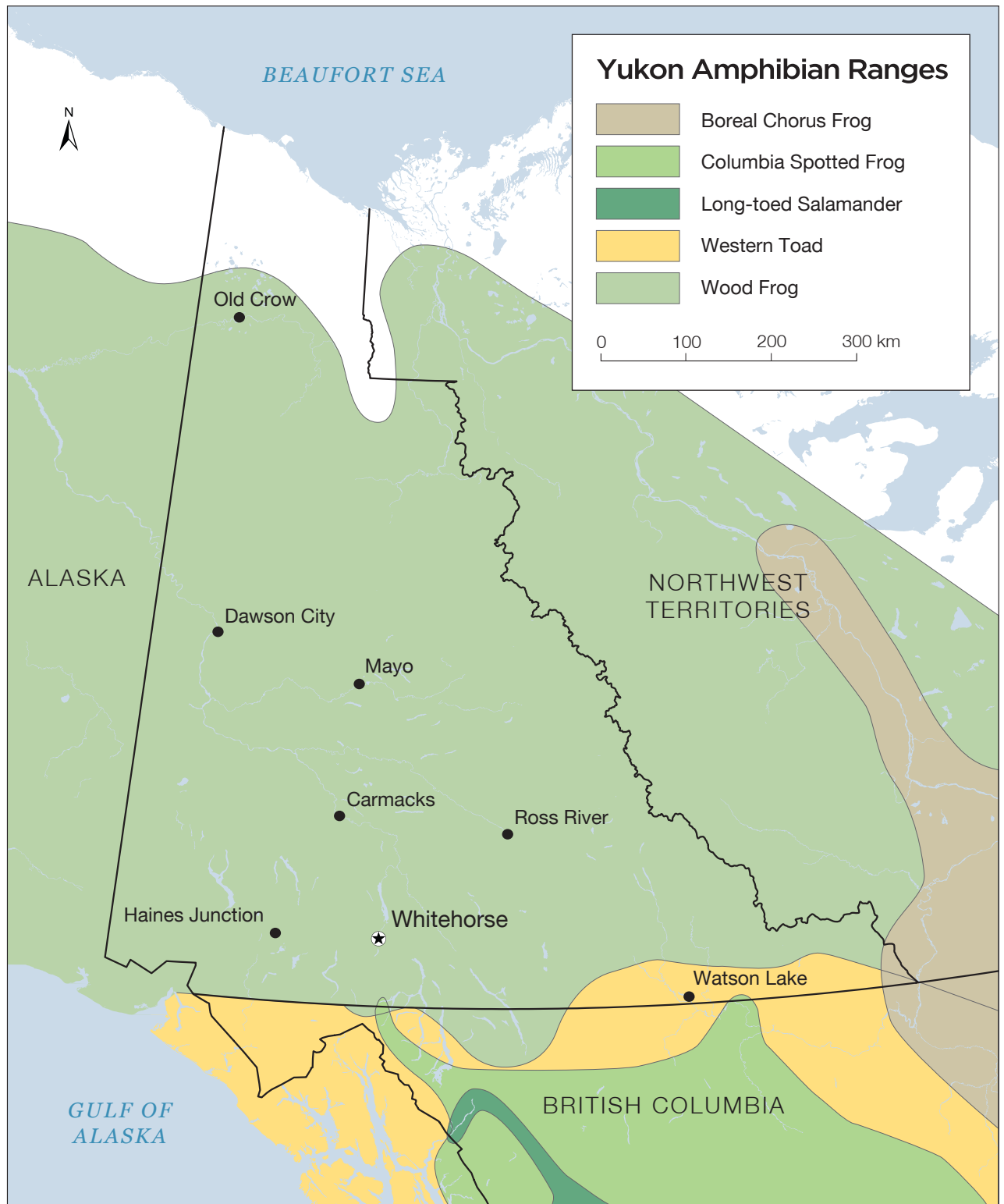


Figure 1: Shows the range of Yukon amphibians. (Within Yukon, the ranges of the Western Toad, Boreal Chorus Frog, and Columbia Spotted Frog are poorly known and abundance information is based on expert opinion.)

Western Toad

The Western Toad is distributed in Yukon along a narrow margin near the Yukon-British Columbia border, absent only from a region around Teslin Lake (Figure 1). The Western Toad enters Yukon in the southern Liard River Basin from the Meister River in the west to the Beaver River in the east. They are known to occur in five geographically separated sites in the Liard Basin (metapopulations, which are spatially separated subpopulations of frogs that are linked by dispersal: Meister River, Upper Liard River, Coal River, Toobally Lakes – Smith River, and Beaver River). There has also been an unverified sighting in the LaBiche River, which is known to represent suitable habitat for the Western Toad. Surveys have been sparse; therefore more populations may exist. The estimated number of mature individuals is unknown, but likely fewer than 10,000 (sensu Slough 2011). The extent of occurrence in the Liard Basin between the Meister River in the west and the Beaver River in the east is approximately 10,000 km², but it is estimated that the area of occupancy may be less than 500 km². Western Toads are relatively intolerant of urban expansion, conversion of habitat for agricultural use, non-native predators and competitors, and disease (COSEWIC 2002). The Western Toad was assessed as a species of Special Concern in 2002 by COSEWIC (COSEWIC 2002); this assessment was recently reconfirmed (COSEWIC 2012b). It was listed on Schedule 1 of the federal *Species at Risk Act* (SARA), the official list of wildlife species at risk in Canada, in 2005.



Photo by Carrie McClelland

Boreal Chorus Frog

There is only one known population of Boreal Chorus Frog in Yukon – individuals from this population breed in five or more ponds in the lower La Biche River Valley. It is also found in the southern Northwest Territories, but its distribution in northern British Columbia is poorly known (Figure 1). It is estimated that fewer than 1,000 adults occupy this area of Yukon, and the extent of occurrence and area of occupancy are likely less than 1,000 km². The Boreal Chorus Frog has not been assessed by COSEWIC.



Photo by Bruce Bennett

Columbia Spotted Frog

The Columbia Spotted Frog is locally abundant in four known and one suspected breeding populations, forming two metapopulations in the Bennett Lake and Hyland River areas, including Irons Creek Lake. It is widespread across northern British Columbia, west of the Rocky Mountains (Figure 1). There may be fewer than 1,000 adults (*sensu* Slough 2011). This species remains close to breeding ponds at all times; therefore the extent of occurrence and area of occupancy are both expected to be less than 1,000 km². The Columbia Spotted Frog was assessed nationally by COSEWIC in 2000 as Not at Risk (COSEWIC 2000).



Photo by Cameron Eckert

Wood Frog

The Wood Frog is widely distributed across much of Yukon, north to Old Crow Flats (Figure 1). They are widespread and abundant in suitable wetlands below arctic and alpine treelines. Observations have been made of Wood Frogs in the alpine, east of Kluane Lake at 1463m (Wong 2012). Though population surveys have not been conducted, it is estimated that more than 10,000 mature individuals are found in Yukon (*sensu* Slough 2011). The extent of occurrence is approximately 420,000 km² (87% of Yukon), and the area of occupancy is approximately 295,000 km² (61% of Yukon). The Wood Frog has not been assessed by COSEWIC.



Photo by Bruce Bennett

Life Cycle of the Wood Frog



Artwork by Lee Mennell

Management Objectives & Recommendations

The goals of this plan are to maintain healthy populations of amphibians across their ranges in Yukon to prevent species from becoming Threatened or Endangered. The plan also aims to increase public appreciation, awareness, and stewardship of amphibians and their habitats. To help reach these goals, the plan has four objectives and a series of recommendations.

Objective 1: Improve knowledge of the distribution and abundance of amphibians

Prior to 1993, most amphibian observations in Yukon were collected opportunistically by biologists surveying for other wildlife species and by the public. Yukon's remoteness and lack of dedicated amphibian surveys limited the collective knowledge of amphibians to information about the Wood Frog and a small number of Western Toad records (Slough and Mennell 2006; Slough 2011). Columbia Spotted Frog and Boreal Chorus Frog, the two rarest species, were first recorded in the 1990s. Since 2004, amphibian surveys and additional observations made throughout the territory have profoundly increased our knowledge of the ranges and occurrences of these species. However, much of Yukon has not been surveyed for amphibians, especially areas outside of major road and river access corridors. This is an issue because amphibian populations are highly variable in nature due to their sensitivity to environmental conditions.

Over the years Environment Yukon staff have received many observations of the Wood Frog, and this has contributed to better knowledge of its range than that of the other amphibian species. Most of these observations were made opportunistically by field biologists or by members of the public. Local knowledge and traditional ecological knowledge has also been an extremely important source of information.

Amphibian surveys typically involve visual encounter surveys and dipnetting of terrestrial, semi-terrestrial (wetland) and aquatic habitats (Thoms et al. 1997). Audible calls, generally made during the spring breeding season, can be identified to species. Researchers can use field identification keys to identify the various life-stages (e.g., egg masses, tadpoles, juveniles, adults; Corkran and Thoms 2006; Matsuda et al. 2006). Surveys are typically conducted during the breeding seasons, generally late April through



Photo by Jon Leary

early June, and during the warm months, June through August, when amphibians are most active. Tadpoles are observed throughout the summer, with metamorphs appearing on land in late July and August. Late observations may be made on warm days in September. Priority survey locations (Figure 1) include areas in each species' known range near known occurrences. Information collected can then be submitted to the Yukon Conservation Data Centre.

Long-term breeding surveys, done annually at the same locations, can help detect population changes and provide the basis for assessing the conservation status of species. Standardization of protocols should be a key component of any monitoring program developed for Yukon amphibians. For example, acoustic surveys such as those done under FrogWatch use volunteer observers to record amphibian occurrence and abundance, using nationally adopted protocols (FrogWatch 2012). The United States Geological Survey's Terrestrial Wetland Global Change Research Network (USGS 2011) is another example of a monitoring program that uses standard protocols to measure the response of amphibians to climate and global changes. Territorial habitat protection areas and parks may provide an opportunity for annually monitoring "benchmark" populations and working with local First Nations and communities. Information collected should be submitted to the Yukon Conservation Data Centre. The Yukon Wetlands Technical Committee has identified 52 wetlands of ecological importance, which may also be useful as sites for potential long-term amphibian monitoring, as part of a larger ecological monitoring program.

Recommendation 1

Opportunistic observations and local and traditional ecological knowledge of amphibians and other species should be encouraged and continue to be recorded.

Recommendation 2

Consider implementing a monitoring program, should resources allow.

Objective 2: Identify and maintain key amphibian habitats

All Yukon amphibian species are "pond-breeding" amphibians because they depend on water for egg-laying and tadpole development. Juveniles and adults are mainly terrestrial, but they require moisture and may remain near wetlands. Each species has different preferences for breeding wetland types, foraging habitats, and hibernating habitats (Slough 2011). The habitat requirements and physiological adaptations of each species have profound effects on their ranges in Yukon. Breeding sites are the most important habitats for these species. Maintenance of these habitats is crucial for the survival of populations



Photo by Cameron Eckert

(Slough 2011). Documenting the locations of these habitats is important for land-use planning, environmental assessments and general habitat management. Landscape-level land-use planning will benefit amphibians by considering the need for habitat connectivity.

Currently there are few breeding sites known. It is important to document breeding habitats within known ranges, particularly for the Western Toad. Without this information on important habitats and some of the other habitat requirements of the four species; it is difficult to ensure these habitats are provided adequate attention and consideration in land-use planning and environmental assessment. Important amphibian habitats should be identified, mapped and entered into existing Environment Yukon databases (such as, the Yukon Conservation Data Centre or the Wildlife Key Areas) so that they are available for use in land-use planning and environmental assessments.

Wetland notations, management plans for protected areas, land-use plans, and forestry plans are existing tools and approaches available to land managers to manage important amphibian habitats.

Terrestrial habitats are believed to be less limiting to Yukon amphibian species; however, terrestrial areas may be important for foraging, movements, and hibernation. Landscape-level wetland and terrestrial habitat conservation is encouraged. Existing processes used in land-use planning, environmental assessments, and protected areas planning can be used to identify, mitigate impacts to, and if necessary, conserve important habitats.

Most Yukon protected areas (e.g., national and territorial parks, special management areas, habitat protection areas and national wildlife areas) encompass some of the habitat and range of the Wood Frog. The 16 km² Coal River Springs Ecological Reserve, a territorial park, protects some key Western Toad aquatic and terrestrial habitat. None of the known breeding sites of the Columbia Spotted Frog and Boreal Chorus have received any specific protection or elevated special management designations.

It is expected that the anticipated management plan for the Western Toad in Canada will prescribe specific habitat protection recommendations that may be relevant in Yukon (Provincial Western Toad Working Group 2010).

Recommendation 3

Identify and map important amphibian habitats.

Recommendation 4

Manage important amphibian habitats to avoid and minimize effects from anthropogenic disturbances.

Objective 3: Assess and mitigate threats to amphibian populations

Amphibians face many global threats (Stuart et al. 2004). Their reliance on aquatic and terrestrial environments and their permeable skin contribute to their vulnerability. Major global threats include habitat loss, habitat fragmentation, traffic mortality, collecting for food, bait, medicine and education, acid rain, chemical contaminants and pesticides, introduction of exotic species such as competitors and predators, diseases from non-native fish, emerging diseases (e.g., Chytrid Fungus

(*Batrachochytrium dedrobatidis*), ranavirus), ultraviolet radiation which may reduce hatching success, global climate change which affects water levels and temperature and results in extreme weather events, or combinations of these (Daszak et al. 1999). For example, deformities, or malformations, have been noted in amphibians in Alaska (Alaska Department of Fish and Game 2006), British Columbia (Provincial Western Toad Working Group 2010) and Yukon (Environment Yukon 2000). They have been attributed to contaminants, trematode parasitism, and predator injury (which remove limbs, usually in the tadpole stage), and their impact on population dynamics is unknown (Blaustein and Johnson 2003).

While many of the common causes of declines do not yet threaten our amphibians in Yukon, populations in pristine areas of other parts of North America, which are not apparently affected by human activities, have declined or have been extirpated (Slough 2008). Forestry, oil and gas developments, and agriculture have the potential to severely modify amphibian habitats through loss, degradation, and fragmentation, and by contamination of air and water (Slough 2008). The Boreal Chorus Frog co-occurs with humans in a variety of land-use situations and is relatively tolerant of habitat modification.

Eliminating or mitigating the human impacts on amphibians and their habitat will be important to ensure that populations remain viable across their Yukon range. Climate change, introduced fish species, and emerging diseases likely pose the greatest threats to amphibians in Yukon (Slough 2009a).

Diseases such as Chytrid Fungus and ranaviruses are emerging threats to Yukon amphibians. These diseases appear to be widespread but not ubiquitous. Periodic monitoring for these diseases through incidental collection and testing can support early disease detection and possibly provide an indication of the frequency of infection. This information may also help to determine the effect of the diseases and pathogens on natural populations (Slough 2009b).

Rainbow Trout (*Oncorhynchus mykiss*) and other species are regularly stocked into around 15-25 Yukon pothole lakes, but there have been no significant assessments of risk of this activity to amphibians. Irons Creek Lake, which was stocked from 1990-2003 with Rainbow Trout, is one of four known breeding sites in Yukon for the Columbia Spotted Frog (YCDC 2012) – a species that is vulnerable to fish predation. There are no plans at present for future fish stocking at Irons Creek Lake. Predation by fish on the Western Toad is not currently thought to be a concern as both adults and their tadpoles are unpalatable to fish (COSEWIC 2002), however there is still a concern that introduced fish may inadvertently carry pathogens that could adversely affect amphibians such as Chytrid Fungus and aquatic water mould, which may cause the mass mortality of amphibian embryos.

Recommendation 5

Develop a disease and pathogen protocol for amphibians in Yukon. A contingency plan to manage or mitigate diseases and pathogens should be incorporated into this protocol.

Recommendation 6

Ensure that all introductions of live fish follow the National Code on Introductions and Transfers of Aquatic Organisms; and consider potential impacts on amphibians.

Recommendation 7

Adopt best management practises when conducting research/assessment in wetlands and ponds to prevent the spread of disease.

The Government of Yukon is co-signatory to Canada's *National Code on Introductions and Transfers of Aquatic Organisms* (Department of Fisheries and Oceans 2003). The Code sets in place a mechanism for assessing proposals to move aquatic organisms from one water body to another and provides a risk assessment procedure for potential impacts of introductions and transfers of aquatic organisms. The Code applies to introductions of live fish to create recreational and commercial fisheries and is followed in the Fisheries Program of Yukon government. Rainbow Trout imported into Yukon must come from a certified disease-free hatchery.

Objective 4: Increase public appreciation of amphibians and their habitats

Our knowledge of Yukon amphibian ranges, northern adaptations, and emerging threats continues to increase. To ensure that this continues and also to engender stewardship amongst the public for these animals, amphibian viewing should be promoted with either guided or described viewing opportunities.

Many people are unaware that several species of amphibians occur in Yukon. Others enjoy viewing them and learning about their natural history. Children tend to be especially attracted to frogs and toads, and educators use this natural interest to aid in teaching biology, general science, environmental issues, and conservation. Yukon offers many Wood Frog viewing opportunities, but viewing opportunities for the other species are limited, given their localized distribution. Local Wood Frog breeding ponds are usually well known and make excellent field sites for educational programs. Examples include Paddy's Pond and Pelly Pond in Whitehorse, though many Yukon schools have breeding ponds nearby. It is suggested that interpretative initiatives by governments and other organizations (for example, Yukon Conservation Society) consider maintaining current programs and materials, or adding amphibian viewing into their programs. When promoting amphibian viewing, a "leave-them-be" ethic should be included to decrease the amount of handling of amphibians.

Recommendation 8

Continue to develop and disseminate public information (such as posters and brochures) about amphibians in Yukon that help to instil a stewardship ethic. Ensure that these materials illustrate the risks of transferring diseases between water bodies.

Recommendation 9

Promote amphibian viewing opportunities and encourage school programs to include learning about amphibians in Yukon.



Photo by Rory Masters

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Appendix A

Yukon Amphibian Workshop Participants

October 21-22, 2009

Selkirk Renewable Resources Council	Jerry Kruse
Laberge Renewable Resources Council	Dorothy Bradley, Dave Bunbury
Friends of McIntyre Creek	Tami Hamilton
Environment Yukon	Oliver Barker, Bruce Bennett, Heather Clarke, Cameron Eckert, Thomas Jung (Facilitator), Piia Kukka, Tess McLeod, Mark O'Donoghue, Troy Pretzlaw, Michelle Sicotte
Environment Canada	Syd Cannings, Shannon Stotyn
Parks Canada	Carmen Wong
Yukon College	Scott Gilbert
Private Sector	Maria Leung, Lee Mennell, Graham Pelchat, Brian Slough

Notes: Not all individuals were part of the planning process in all years or at the conclusion of the planning process. Therefore, those who were not part of the final reviews may not agree with all of the final outcomes.

