ARTIC AND COASTAL TUNDRA

David Tessler

This habitat includes the low-lying, Arctic Coastal Plain (Beringian Tundra ecoregion) and the drier uplands of the Arctic Mountains north of tree line (Interior Alaska Taiga ecoregion), as well as the Subarctic Coastal Plain of western Alaska and the Alaska Peninsula Mountains (Alaska Peninsula and Bristol Bay Basin ecoregion). Permafrost is continuous, except in southern parts of the region, and surface water dominates the landscape in lowlands (20–50% of the coastal plains). Freeze-thaw cycles form a patterned mosaic of polygonal ridges and ponds, and the plains are dissected by rivers, sloughs, and deltas emptying into the Bering Sea and the Arctic Ocean. Wet and mesic graminoid (grasses and grass-like plants such as sedges) herbaceous communities dominate the lowlands, and numerous ponds, lakes, and rivers dot the landscape. Tall shrub communities are found along rivers and streams, and low shrub communities occupy uplands. Patchy forests of white spruce and paper birch penetrate the region on the eastern and southern edges.

Wetlands dominate lowland areas of the coastal plains.

Only a single amphibian species, the Wood Frog, is known to occur in this habitat, owing to its advanced freeze tolerance. Wood Frogs in this region show a high background level of physical abnormalities. It is uncertain whether abnormalities are caused by the stress of living very close to the frog's physiological limitations or by external environmental factors. As climatic conditions continue to ameliorate, the species may expand its range and distribution rapidly owing to prevalence of surface water. However, climate change is also causing surface water to disappear rapidly across much of the region, and may cause local extirpations of both recently colonized and long occupied areas.

Natural disturbances are limited mainly to fires, and annual flooding as the ice breaks up on the rivers. Wildfires are frequent and extensive: Over 2,500,000 acres (1,000,000 ha) of this habitat burned in 2004 and 2005. Fire management allows "burnout" of wildfires in most areas without human infrastructure. Human settlements are small, scattered, and not connected by roads. Man-made disturbances are not as common on the landscape as in more southern areas, but mining and petroleum exploration and developments occur over the landscape. Other environmental issues include: atmospheric deposition of mercury and other heavy metals from industrial practices in Asia and Northeastern Europe; the potential for large contaminant spills and downstream acidification or heavy metal

contamination; and the development and ongoing operation of large open-pit mineral mines. In addition, available surface water may decline with the disappearance of permafrost, decreases in precipitation, and increases in evaporation as northern temperatures increase.

Tara Chestnut and Hannah E. Anderson

Recent studies in Alaska have found that Wood Frogs frequent tundra areas (e.g., more than 1 km from the boreal forest), as long as shrubby vegetation is available in the riparian area.

CHARACTERISTIC SPECIES
Frogs and Toads: Wood Frog

MAXIMIZING COMPATIBILITY: Timberlands, Farmlands, Recreational Lands, and Other Integrated Land Uses
Consider the following options if benefiting amphibians is secondary to other management objectives.

- **Avoid draining or filling wetlands.** *Do not deposit materials in wetlands where Wood Frogs may be breeding.*
- **Minimize the amount of sediment, nutrients, and contaminants that enter wetlands.** *Wood Frogs breed in wetlands and tadpoles are sensitive to water quality.*
- **Minimize disturbance to wetland soils and vegetation.** *Establish 100 to 330 ft (30-100 m) buffers around wetlands where natural vegetation is maintained so that Wood Frogs have foraging and terrestrial overwintering habitat (see buffer section on pages 82 and 135).*
- **Avoid construction and habitat alteration (including earth moving, general construction, and road building) during the months when the Wood Frog population is concentrated and vulnerable.** *Adults concentrate in wetlands to breed in early spring; eggs and tadpoles remain in water bodies until late summer.*

IDEAL: Refuges, Sanctuaries, and Preserves
Consider the following options if benefiting amphibians is a primary objective and when landowners and managers wish to optimize herpetofauna diversity and abundance.

- **Maintain natural wetland habitats and nearby uplands through the use of buffers.** *Buffers of at least 50-330 feet (15-100 m) in width will help reduce the effects of point-source contamination.*
- **Identify corridors of possible colonization (valleys and flowing waters from areas where Wood Frogs are present) and maintain connectivity by minimizing activities in these areas.** *Undisturbed patches or corridors that have high cover and moisture can provide important migratory habitat.*
- **Monitor the presence and absence of Wood Frogs in your area, as well as the apparent rate of physical abnormalities.** *Changes in occupancy or physical appearance in Wood Frogs may signal other changes in the immediate environment.*
- **To maintain appropriate habitats and corridors for Wood Frogs and other amphibians, manage not only the wetlands you have today, but manage the habitats you will have in the future.** *Climate change may result in rapid and extensive changes in wetland type, extent, quality, flow regime, and persistence. Anticipate the mosaic of habitats you are likely to have in future decades as you consider which areas to reserve for amphibian conservation.*

Tara Chestnut and Hannah E. Anderson

Harsh climates, low vegetative cover, and permafrost affect the suitability of arctic areas for amphibians and reptiles. Changes that result from climate change may affect the distribution of these species in the area in the future.

This is the "Coastal and Arctic Tundra" module of the PARC Publication HMG-4, ISBN 0-9667402-5-4. Please visit ***www.parcplace.org*** for further information, copies of the complete document, or a web-based version of the Guidelines.

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HABITAT MANAGEMENT GUIDELINES FOR AMPHIBIANS AND REPTILES OF THE NORTHWESTERN UNITED STATES AND WESTERN CANADA

Technical Publication HMG-4

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