SPECIES ACCOUNT

Species Data

Common Name:	Great Basin Spadefoot
Scientific Name:	*Spea intermontana*
Species Code:	A-SPIN
BC Status:	Blue-listed
Identified Wildlife Status:	V2004
COSEWIC Status:	Threatened

Project Data

Project Name:	Vernon Commonage Sensitive Ecosystems Inventory
Project Type:	Terrestrial Ecosystem Mapping
Area:	Central Okanagan
Ecoprovince:	Southern Interior
Ecoregions:	Thompson-Okanagan Plateau
Ecosections:	Northern Okanagan Basin (NOB)
BGC Units:	IDFxh1
Map Scale:	1:15 000

Distribution

Provincial Range

Spadefoots occur in the Okanagan, Similkameen, Kettle, Nicola and Thompson valleys north to 70 Mile House in the Cariboo, west to Princeton and east to Grand Forks (Sarell 2004). In addition to climate, the range of this species is related to the distribution of deep friable soils and wetlands. Their range also may be correlated with the range of pocket gophers (*Thomomys talpoides*) and other small mammals due to loosening of compact morainal soils.

Elevation Range

275 - 1800 m but generally found breeding below 600 m (St. John 1993, Cannings 1998).

Distribution in the Project Area

Spadefoots have not been extensively surveyed in the North Okanagan until recently (i.e., 2003 and 2004 Frogwatch data). Known records are primarily from the Vernon area, including the Vernon Commonage, Okanagan Landing and Mud Lake near Middleton Mountain (Ministry of Environment 2005).

Ecology and Habitat Requirements

Adult spadefoot toads emerge from underground chambers in mid April and migrate to aquatic breeding sites. Migrations usually coincide with the first warm rainfall of the spring. Females deposit eggs from April to early June. Between 300 and 800 eggs are deposited, in clusters of 20 to 40 eggs, which are fertilized externally. Eggs are normally deposited under the water surface on vegetation or the bottom of pools. Eggs and tadpoles develop relatively rapidly which enables the Great Basin Spadefoot to successfully breed in aquatic habitats that are only available seasonally for short periods before drying up. Tadpoles also exhibit a tolerance to very warm water temperatures (Low 1976). Eggs generally hatch within a week, depending on water temperature, and tadpoles transform in six to eight weeks. The length of the breeding season varies considerably between sites (St. John 1993) and between years, but most metamorphosed toadlets appear in July (Cannings 1998). There are three movement periods, generally on warm, rainy nights: when the adults immigrate to breeding sites and when they emigrate after breeding, and the other after the young metamorphose.

Site fidelity to breeding ponds has not been documented. It is assumed that spadefoots will use the nearest available water source, as many breeding sites are ephemeral and not always suitable.

Although information on dispersal distances is lacking, spadefoots may migrate several hundred metres between aquatic breeding sites and terrestrial habitats, and some may travel much further (Sarell 2004). Distances traveled from breeding sites likely vary with the proximity to suitable terrestrial habitats, and potentially between ages and genders

After leaving the breeding ponds, spadefoots search out suitable upland habitats, with well-drained friable soils, in which they can burrow to avoid desiccation and extreme temperatures. They will emerge at night to forage on insects, mainly earthworms, ants, beetles, crickets and flies (Nussbaum et al. 1983). Spadefoots also spend the winter in underground retreats, where a layer of skin secretion in their chamber forms an additional protective barrier again the elements.

Reproducing (Security/Thermal Habitat)

Spadefoots breed in the shallows of temporal and permanent water bodies, mostly in temporary or ephemeral pools less than 10 cm deep (Orchard 1985). Ideal wetland habitats retain water from mid-April to the end of May, are free from predatory fish, and are protected from livestock and off-road vehicle disturbance (Chapman et al. 2004).

Eggs are generally laid under water on emergent vegetation (Leupin et al. 1994), but vegetation does not appear to be necessary.

General Living (Security/Thermal Habitat and Food)

Foraging and over-wintering occurs in low elevation terrestrial habitats, ideally dry shrub-grasslands and open woodland with loose, deep and friable soils, or rodent holes for easy burrowing (Chapman et al. 2004). Spadefoots spend the daylight hours during the growing season in rodent burrows, or bury themselves in loose soil or under rocks and logs during the day (Orchard 1985, Stevens 1995). Sandy soils are preferred (Green and Campbell 1984). Habitats with sod-forming grasses (e.g., pinegrass, agronomics such as Kentucky bluegrass) may be less suitable as they form rooted mats, decreasing the availability of friable (loose) soil surface area available for denning.

Ratings

This model employs a 4-class rating scheme because there is insufficient knowledge of habitat requirements to use a 6-class scheme yet there is sufficient knowledge to go beyond a 2-class rating scheme. This complies with the recommended rating scheme in the RIC (1999) standards manual.

Provincial Benchmark

Ecosection	Southern Okanogan Basin
Biogeoclimatic Units	BGxh1, PPxh1
Habitats	Low elevation wetlands in or near deep-soiled grasslands

Map Themes

Habitat Use	Life Requisite	Season	Rating Code	Ecosystem Attributes
Reproducing	Security/ Thermal	Spring	RE	• small, shallow waterbodies (permanent or ephemeral)
General Living	Security, Thermal, Food	All year	LIA	• shrub/grassland or open low elevation forest with deep, friable soils

Ratings Assumptions

Reproducing – Security/Thermal (RE)	
Site Series	• Open water and wetlands rated up to High
General Living – Security, Thermal, Food (LIA)	
Site Series	• Grassland, shrub, open Py / Fd forest up to High
Structural Stage	• No effect on rating
Shrub Density	• No effect on rating
Range Condition	• No effect on rating
Aspect	• Cool rated down 1
Slope	• Steep slopes rated down 1
Soil Texture	• Sandy soils rated up to High • Very coarse soils (e.g., gravely, cobbly) rated up to Low, including fans • Fine soils (silt, clay) rated up to Low in the absence of rodent burrows
Soil Depth	• Shallow soil up to Moderate, very shallow soil Nil

Map Interpretation

The model for Great Basin Spadefoot predicts suitability for two maps themes: breeding ponds (RE) and terrestrial habitats for general living all year (LIA). The breeding theme overlays the foraging theme on the map.

Both themes are rated using the highest value method, which portrays the rating for the highest suitability habitat occurring in the polygon.

Terrestrial living habitats that are in close proximity to high value breeding habitats are more likely to be used. Although spadefoots do not generally travel far from breeding ponds, living habitat has not been limited to any given distance from ***identified*** breeding habitat, as they are know to breed in very small and/or temporary "puddles" that are difficult to distinguish at this scale of mapping.

Literature Cited

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Great Basin Spadefoot Suitability - Vernon Commonage