# PRIORITY AREA SUMMARY FEATURES

The following provides an overview of two of the features – BEC zones, representation and ranching – that are profiled in the area summaries and their accompanying maps.

## BEC ZONES

The following is a brief description of the BEC zones reported in the area summaries (Table 2).[9]

**Table 2: BEC Zones in the Thompson Basin Grassland Portfolio**

| Label | Descriptor |
|---|---|
| BGxh2 | Thompson Very Dry Hot Bunchgrass Variant |
| BGxw1 | Nicola Very Dry Warm Bunchgrass Variant |
| PPxh2 | Thompson Very Dry Hot Ponderosa Pine Variant |
| PPxh2a | Thompson Very Dry Hot Ponderosa Pine Variant – Grassland Phase |
| IDFxh2 | Thompson Very Dry Hot Interior Douglas-Fir Variant |
| IDFxh2a | Thompson Very Dry Hot Interior Douglas-Fir Variant – Grassland Phase |
| IDFxh1a | Okanagan Very Dry Cool Interior Douglas-Fir Variant – Grassland Phase |
| IDFdk2 | Cascade Very Dry Hot Interior Douglas-Fir Variant |
| IDFdk1 | Thompson Very Dry Cool Interior Douglas-Fir Variant |

## REPRESENTATION

### *TEXT QUALIFIERS FOR REPRESENTATION CATEGORIES*

A text qualifier was used in place of numbers to describe the contribution a priority area makes to achieving representation of a feature target:

- < 1.0 %: insignificant and not reported
- 1.0–4.9%: low contribution
- 5.0–9.9 %: moderate contribution
- 10–19.9 %: high contribution
- ≥ 20 %: very high contribution

The representation classes are further stratified by biogeoclimatic subzone. For example, a contribution towards the representation of suitable burrowing owl habitat can be for one of several habitat–subzone combinations; thus, the priority area could be representing "suitable burrowing owl habitat in BGxh2", or "suitable burrowing owl habitat in BGxw1", etc.

For the sake of simplicity, when describing the contribution of a particular priority area to a representation class, the subzone associated with that class is not reported, but in practice, the contribution of that priority area is for the representation class in combination with a specific biogeoclimatic subzone.

The focus of reporting is primarily on very high, high, and moderate contributions to representation. Low contributions may be noted where they are of specific relevance to the priority area. They may also be noted for smaller areas.

### GRASSLANDS SPATIAL REPRESENTATION

The spatial representation of grasslands in the priority areas is classified as follows:

- Grasslands 0–250 m: grasslands 0–250 m from the forest edge (the forest-grassland interface) or the edge of a major water feature (>100 ha)
- Grasslands 250–500 m: grasslands 250–500 m from the forest edge
- Grasslands 500–1000 m: grasslands 500–1000 m from the forest edge
- Forest 0–250 m: forest 0–250 m from the forest edge (i.e., interior forest located 0–250 m from the forest-grassland interface)
- Small patch inside transition: small grasslands patches that occur inside the transition zone 250 m into the forest
- Small patch beyond transition: small grasslands patches that occur beyond the transition zone between forest and grasslands. These are small grasslands areas in areas dominated by forest

### SOLAR–SLOPE

This category is a combination of slope and solar classes (a measure of how much sunlight an area receives). Together, these classes represent a variety of conditions that influence the type of vegetation/plant communities that occur in an area.

| Slope Classes | Solar Classes |
|---|---|
| level | cool |
| low | warm |
| moderate | hot |
| steep | |
| very steep | |

### TOPOGRAPHIC FEATURES

This category identifies three major topographic features:

- Hill crests (“high”)
- Low lying wet (mesic) areas and gullies (“low”)
- Areas lying between (“middle”)

These features represent general areas associated with certain plant communities and wildlife.

### Shoreline of Large Water Features

This category has one class that identifies a 500-m band of naturally vegetated foreshore along large water features (lakes and streams > 100 ha). One goal of including this feature was to identify shoreline areas that can be incorporated into an uninterrupted grassland landscape that extends from low-lying shoreline up through lower, middle, and upper grasslands.

### Water Features

Ponds, small lakes, marshes, swamps, and other water features were divided into three size classes:

- Small (< 3 ha)
- Medium (3–10 ha)
- Large (>10 ha)

The purpose of this classification was to partition and encompass a broad spectrum of associated plants and wildlife. For instance, certain amphibians are associated primarily with small ponds, whereas waterfowl are most often associated with medium to large water features. Only water features up to 100 ha are included in this category. Larger water features are addressed through the shoreline of large water features category noted above.

### Water Feature Alkalinity

A special attribute of many ponds that occur within grasslands in the region is their high alkalinity level, which is often evident by a white crust of salt around the shoreline. Unique communities of plants and animals are associated with these ponds. All of these ponds are grouped into one class, independent of size.

### Burrowing Owl Habitat Suitability

The burrowing owl suitability model identifies grasslands areas of low slope and a distance of 500 m from any stand of trees. Habitat suitability classes were defined as yes/no.

### Western Rattlesnake Habitat Suitability

Den (**hibernacula**) suitability was determined by identifying areas with high solar radiation (hot) and high ruggedness (rocky), among several other variables.

The following classes describe some of the different types of rattlesnake habitat suitability:

- High den near sighting: high den suitability near a rattlesnake sighting
- High den: high den suitability not near a sighting
- High den in MCP: high den suitability inside a **minimum convex polygon** (MCP) surrounding known rattlesnake dens that occur near one another
- In MCP: inside an MCP surrounding known rattlesnake dens that occur near one another

### LEWIS'S WOODPECKER HABITAT SUITABILITY

Suitability was based on the proximity of an area to mapped old-growth ponderosa pine stands. These areas were further subdivided into two categories:

- Open grasslands: < 10% crown closure
- Ponderosa at forest edge: ≥ 10% crown closure

Ponderosa pine is one of two main tree species used by Lewis's woodpeckers for nesting. The other is black cottonwood. Stands of this tree are identified as highly suitable for Lewis's woodpecker. They are labelled:

- Cottonwood in grasslands

### BADGER HABITAT SUITABILITY

The analysis uses the B.C. Conservation Data Centre's (CDC) badger habitat suitability GIS layer. It represents high use badger areas identified through **radiotelemetry** studies, badger sightings databases, and expert input on suitable habitat.

### SHARP-TAILED GROUSE HABITAT SUITABILITY

Two separate but related models were used to identify suitable sharp-tailed grouse habitat:

- Suitable **lek**: terrain that is suitable for sharp-tailed grouse dancing/breeding sites (leks)—that is, hill and hummock crests in open, relatively shrub-free, grasslands
- Suitable vegetation: suitable cover and winter feeding vegetation near modelled lek sites

## RANCHING

The "Ranching" section within the Priority Areas Summaries provides information about Working Landscape features, including Range Units, Pastures, forage resources, and forage values. "Range Units" and "Pastures" are Ministry of Forests and Range land management divisions, which are used to allocate grazing tenures and implement range management prescriptions. "Available forage" represents the total extent of grasslands identified through the GCC's B.C. Grasslands Mapping Project.

Available forage was classified as Lower, Middle, or Upper Grasslands based on BEC data[3]. Forage values were calculated for these three grassland zones based on a cost of $0.65 per cow per day to provide feed, a 15-day utilization period, and optimal stocking rates of 0.5 **Animal Unit Months** (AUM) for Lower Grasslands, 0.7 AUM for Middle Grasslands, and 1.6 AUM for Upper Grasslands (Rick Tucker, Range Agrology Specialist, Ministry of Forests and Range, pers. comm.).

[3] The "Grasslands and Associated Ecosystems" subsection in "Overview of the Thompson Basin Ecosection" describes the relationship between BEC zones and grassland types within the Thompson Basin Ecosection.

# STRATEGIC RECOMMENDATIONS FOR THE THOMPSON BASIN

## STRATEGIC RECOMMENDATIONS

Site-specific management direction and recommendations for priority grasslands are presented in the area summaries. The recommendations provided in this section apply to all of the terrestrial and riparian priority areas in the Thompson Basin Ecosection, plus the working landscapes outside of those areas.

### TERRESTRIAL AND RIPARIAN PRIORITY GRASSLANDS

The objective of the Priority Grasslands Initiative is to achieve no further fragmentation and loss of priority areas; therefore, the main recommendation of this initiative is for terrestrial and riparian priority areas to be maintained in a state that will allow ecosystems to function naturally.

This does not exclude human use of grasslands; however, human use of any kind must be carried out in ways that ensure the ecosystems' natural structure, composition, and function are protected at the site level, and natural spatial and temporal patterns are maintained across the landscape.[10] Certain uses, such as ranching and low intensity recreation (e.g., non-motorized recreation on designated trails), can co-exist with the naturally functioning properties of an ecosystem; however, **best management practices** should be followed. Appendix 3 provides a list of best management practices documents that are specific to British Columbia.

#### *Focal Species at Risk*

Important and suitable habitats for species at risk in the Thompson Basin were included as environmental features in the priority areas analysis. Information on six focal species was used in the analysis:

- badger
- sharp-tailed grouse
- burrowing owl
- Lewis's woodpecker
- western rattlesnake
- Great Basin spadefoot

Recommendations for managing habitat for these species within the priority areas are presented in Table 3 and are discussed below. Please note that not all CDC sight records for provincially listed species in the Thompson Basin Ecosection are shown on the portfolio maps.

**Table 3: Recommendations for Focal Species at Risk in Terrestrial and Riparian Priority Grasslands**

| Species | No Activity (date restrictions) | Special Considerations* |
|---|---|---|
| Badger | within 200 m of maternal burrow: May 1–August 15 | Restrictions need only be in place only for the current season |
| Sharp-tailed grouse | within 100 m of lek: April 1–May 31 | Maintain a variety of habitats within 3 km of leks |
| Burrowing owl | within 500 m of burrow: April 1–July 31; within 150 m for vehicles: year round | Habitat within 1 km; grazing and haying dates |
| Lewis's woodpecker | within 30 m of nest: April 15–August 15 | Trees within 400 m of nest tree and adjacent to foraging areas |
| Western rattlesnake | within 200 m of den: March 1–October 31 | Predictive habitat modelling; roads |
| Great Basin spadefoot | within 25 m of pond: April 15–May 31 | Small, often temporary, ponds |

* See text below for further details.

## BADGER

The badger is red-listed in B.C. and is designated as Endangered in Canada. It is a wide-ranging species that uses a variety of habitats along an elevational gradient from grasslands to forests to alpine meadows. Its distribution in the Thompson Basin is closely linked to the occurrence of its main food source: ground-dwelling squirrels. Areas actively used by badgers may be identified through sightings of family groups (> 1 badger), or by other means, such as radiotelemetry.

### *Recommendations*

**Activity:** Burrows are often re-used, and some are used as maternal dens.[11] Restrict all activities within the 200 m buffer around active maternal burrows between May 1 and August 15. Restrictions on activities surrounding active maternal dens need to be in place only for that year.

## SHARP-TAILED GROUSE

The sharp-tailed grouse is **yellow-listed** in B.C. and has not been assessed in Canada. It uses mid and upper grasslands as breeding and nesting grounds, and ecosystems associated with grasslands, such as aspen **copses** and shrubby areas, during the rest of the year.[12]

### *Recommendations*

**Activity:** No activity within 100 m of a known lek or dancing ground from April 1 to May 31 when the lek is being actively used.[13]

**Habitat Considerations:** From June 1 to March 31, sharp-tailed grouse require a variety of ecosystems, such as bunchgrasses for nesting, and deciduous and shrub **riparian** areas for rearing young and accessing security cover and winter food resources. Maintain a variety of ecosystems within a 3-km radius of known leks, which include grassland areas with > 40 cm vegetation height, and deciduous and shrub riparian areas.[14] Adhere to range management restrictions, such as minimum stubble height and haying dates, as recommended for wildlife habitat areas.[15]

## BURROWING OWL

The burrowing owl is red-listed in B.C. and is designated as Endangered in Canada. It is believed to have been extirpated from B.C. in the early 1980s.[16] A captive rearing program was started in 1990, and from 1992 to 1997, 86 owls were released at six sites in the Thompson Basin.[17] Burrowing owls use flat open grasslands at various elevations as summer breeding grounds.

### *Recommendations*

**Activity:** Burrowing owls can be sensitive to disturbance; therefore, restrict all activities within 500 m of burrow sites during the active breeding season (April 1 to July 31), and limit vehicular traffic within 150 m year round.[18]

**Habitat Considerations:** Identify and maintain foraging areas, which consist of taller grasses (>10 cm) within 1 km of burrows. Adhere to range management restrictions established for wildlife habitat areas, such as no cattle grazing or hay mowing from April 1 to July 31.[19]

## LEWIS'S WOODPECKER

The Lewis's woodpecker is red-listed in B.C. and is designated as **Special Concern** in Canada. It is a loosely colonial species that prefers to breed in open, mature ponderosa pine forests and riparian black cottonwoods stands, but it requires open grassland areas for feeding.[20]

### *Recommendations*

**Activity:** Lewis's woodpeckers will tolerate some human presence, but no activity should occur within 30 m of the nest tree during the breeding season (April 15 to August 15).[21]

**Habitat Considerations:** Within 400 m of a nest tree, maintain forested areas with old, open ponderosa pine or Douglas-fir (< 25% crown closure and > 40 cm diameter at breast height [DBH]), or old, riparian, deciduous trees (e.g., aspen, but preferably black cottonwood > 45 cm DBH) adjacent to open foraging areas.[22]

## WESTERN RATTLESNAKE

The western rattlesnake is blue-listed in B.C. and is designated as Threatened in Canada. It is a venomous snake that reaches its northern distribution limit in the Thompson Basin. These snakes overwinter in dens, which are located mainly on steep-sloped rock

**outcrops**, **talus** slopes, and earth-covered outcrops. The snake's summer range includes grassland, **shrub steppe**, riparian, and forest habitats.[23, 24]

### *Recommendations*

**Activity:** Restrict all activities within 200 m of dens sites from March 1 to October 31. This is necessary not only for maintaining the integrity of the den site but also for protecting nearby gestating females and avoiding human-snake conflicts.

**Connectivity**: No new paved roads should be established within priority areas. Evaluate existing paved roads within and adjacent to priority areas to assess the feasibility of implementing mitigation measures, such as building tunnel systems and erecting exclusion fencing.[25, 26] Conduct adequate surveys to identify high use areas and travel routes to ensure that mitigation measures are effectively implemented.

## GREAT BASIN SPADEFOOT

The Great Basin spadefoot is blue-listed in B.C. and is designated as Threatened in Canada. It occupies grasslands, shrub steppe, and open pine forests.[27] These amphibians use both temporary and permanent ponds and lakes often under three hectares in size for breeding, and terrestrial habitats with loose, deep soils for foraging, hibernation, and **aestivation**.

### *Recommendations*

**Activity:** Restrict all activities within 25 m of spadefoot ponds during the breeding season (April 15 to May 31).[28, 29] Activities near spadefoot ponds from June 1 to April 14 are also a concern.

Survey all suitable ponds to determine if they are used for breeding. However, breeding occurs only when environmental conditions are suitable, which may not happen on an annual basis. Therefore, an absence of breeding activity at a particular pond during one full season may not necessarily mean the pond is unsuitable for spadefoots.

**Connectivity**: Ensure aquatic and terrestrial habitats are suitably connected to allow spadefoots to move between seasonal habitats.

**Roads**: Evaluate existing roads within and adjacent to priority areas to assess the feasibility of implementing mitigation measures, such as effective under the road tunnel systems (i.e., specialized culverts) with directional fencing

### *Non-focal Species at Risk*

Sightings of a number of other species at risk have been numerous and/or concentrated in the Thompson Basin. Although habitat potential for these species was not modelled, they still warrant descriptions in this portfolio due the high probability of their repeated occurrence in the mapped areas. These species include:

- American avocet
- long-billed curlew
- flammulated owl

- Williamson's sapsucker
- sandhill crane
- gopher snake
- racer

Table 4 shows the recommendations for these non-focal species within the priority areas. These recommendations are derived primarily from the Identified Wildlife Management Strategy's *Accounts and Measures for Managing Identified Wildlife*;[30] however, the recommendations for the American avocet were derived from two other sources.[31, 32] Specific life history details for each species can be found in their respective status report produced by the Committee on the Status of Endangered Wildlife in Canada.[33]

**Table 4: Recommendations for Non-focal Species at Risk in Terrestrial and Riparian Priority Grasslands**

| Species (B.C. list status) | No Activity (date restrictions) |
|---|---|
| American avocet (red) | within 50 m of nest (May 1–Sept 1) |
| Long-billed curlew (blue) | within 50 m of nest (April 1–July 15) |
| Flammulated owl (blue) | within 100 m of nest (all year) |
| Williamson's sapsucker, thyroideus subspecies (red) | within 30 m of nest tree (April 15–September 15) |
| Sandhill crane (blue) | within 200 m of nest (April 1–October 15) |
| Gopher snake, deserticola subspecies (blue) | within 200 m of den site (March 1–October 31) |
| Racer (blue) | within 200 m of den site (March 1–October 31) |

Please note that not all CDC sight records for provincially listed species in the Thompson Basin Ecosection are shown on the portfolio maps.

### WORKING LANDSCAPE GRASSLANDS

Working landscape grasslands warrant consideration in local and regional planning because they support the ranching industry and contain rare ecosystems and important habitat for grasslands species. Maintaining these species and large intact ecosystems is crucial to the survival of B.C.'s grasslands and the cattle ranching industry.

The main recommendation for working landscape grasslands is to maintain them as large contiguous areas. In cases where development proposals for working landscape

grasslands are made, the GCC wishes to be consulted about the broad level impacts of developments on grassland ecosystems and species, and on the ranching industry. The GCC also has the ability to conduct in-depth **ecological assessments.** This is a fee for service product that provides recommendations for directing development away from sensitive and rare ecosystems and lessening development impacts on ecosystems and ranching values.

The following recommendations provide advice on minimizing impacts on grasslands values within working landscape grasslands. These recommendations can be used for such things as local government development permit areas, environmental assessments, and development plans conducted by First Nations governments.

Any development or activities that take place in working grassland landscapes should follow best management practices. Appendix 3 provides a list of best management practices documents that are specific to British Columbia.

### *Focal Species at Risk*

Important and suitable habitats for species at risk in the Thompson Basin were included as environmental features in the priority areas analysis. Information on six focal species was used in the analysis:

- badger
- sharp-tailed grouse
- burrowing owl
- Lewis's woodpecker
- western rattlesnake
- Great Basin spadefoot

Recommendations for managing and conserving habitat for these species outside of priority areas are presented in Table 5 and are discussed below. The ability of these species to move between core habitats (contained, in part, within priority areas) is often crucial to their survival; therefore, recommendations for maintaining corridors for each species are also presented. Although wildlife corridors are discussed in this portfolio, not enough detail is provided to address some of the finer habitat requirements of some species. As a result, it is recommended that field surveys be conducted prior to any site-level planning since many areas in the Thompson Basin have not been adequately surveyed or will need to be re-surveyed to account for species range movements and environmental changes.

**Table 5: Recommendations for Focal Species at Risk in Working Landscape Grasslands**

| Species | No Development | No Activity (date restrictions) | Corridor Width | Special Considerations* |
|---|---|---|---|---|
| Badger | within 200 m of burrow | within 200 m of maternal burrow: May 1–August 15 | > 30 m between priority areas; > 5 m along edges of agricultural fields | Burrowing habitat and roads |
| Sharp-tailed grouse | within 100 m of lek | within 100 m of lek: April 1–May 31 | | Variety of habitats within 3 km of leks |
| Burrowing owl | within 250 m of active natural or artificial burrow | within 500 m of burrow: April 1–July 31; within 150 m for vehicles: year round | | Habitat within 1 km; grazing and haying dates |
| Lewis's woodpecker | within 200 m of nest tree | within 30 m of nest: April 15–August 15 | | trees within 400 m of nest tree and adjacent to foraging areas |
| Western rattlesnake | within 200 m of den site | within 200 m of den: March 1–October 31 | | Predictive habitat modelling; roads |
| Great Basin spadefoot | within 250 m of pond | within 25 m of pond: April 15–May 31 | 25 m | |

* See text below for further details.

## BADGER

The badger is red-listed in B.C. and is designated as Endangered in Canada. It is a wide ranging species that uses a variety of habitats along an elevational gradient from grasslands to forests to alpine meadows. Its distribution in the Thompson Basin is closely linked to the occurrence of its main food source: ground-dwelling squirrels. Areas actively used by badgers may be identified through sightings of family groups (> 1 badger), or by other means, such as radiotelemetry.

### *Recommendations*

**Development and Activity:** No development should occur within 200 m of known burrows. Burrows are often re-used, and some are used as maternal dens.[34] All activities

within the 200 m buffer around active maternal burrows should be restricted between May 1 and August 15. Restrictions on activities surrounding active maternal dens need to be in place only for that year.

**Habitat Considerations:** Badgers have some tolerance of urban areas but require areas suitable for burrowing.[35] Within identified suitable habitat, maintain areas (> 400 $m^2$) of silty or loamy soils with less than 20% coarse fragments (soil particles that are > 2 mm diameter) as burrowing habitat.

**Connectivity**: Keeping priority areas linked with corridors to allow badgers to move safely between habitats is necessary for their survival. Maintain corridors > 30 m wide of native grassland between priority areas, and corridors > 5 m wide of native grassland vegetation along the edges of agricultural fields.[36] Use exclusion fencing in urban areas to direct badgers towards using established travel corridors.

**Roads:** Badgers are wide-ranging animals; their movements average nearly 1 km per day. Consequently, highways are the main cause of badger mortality.[37] Keep to a minimum or, when possible, avoid establishing roads within suitable habitat and the number of road crossings within travel corridors. The impacts of existing and new roads can be minimized by installing effective crossing structures (such as under-the-road passages) and removing concrete roadside barriers.[38]

## SHARP-TAILED GROUSE

The sharp-tailed grouse is yellow-listed in B.C. and has not been assessed in Canada. It uses mid and upper grasslands as breeding and nesting grounds, and ecosystems associated with grasslands, such as aspen copses and shrubby areas, during the rest of the year.[39]

### *Recommendations*

**Development and Activity:** No developments within 100 m of a known lek (dancing ground). In addition, no activity within that 100 m from April 1 to May 31 when the lek is being actively used.[40]

**Habitat Considerations:** From June 1 to March 31, sharp-tailed grouse require a variety of ecosystems, such as bunchgrasses for nesting, and deciduous and shrub riparian areas for rearing young and accessing security cover and winter food resources. Outside of priority areas, maintain a variety of ecosystems within a 3-km radius of known leks, which include grassland areas with > 40 cm vegetation height, and deciduous and shrub riparian areas.[41] Adhere to restrictions relating to range management, such as minimum stubble height and haying dates, as recommended for wildlife habitat areas.[42]

## BURROWING OWL

The burrowing owl is red-listed in B.C. and is designated as Endangered in Canada. It is believed to have been extirpated from B.C. in the early 1980s.[43] A captive rearing program was started in 1990, and from 1992 to 1997, 86 owls were released at six sites in the Thompson Basin.[44] Burrowing owls use flat open grasslands at various elevations as summer breeding grounds.

### *Recommendations*

**Development and Activity:** No development within 250 m of actively used natural or artificial burrows. This pertains to both nest and roost burrows. There shall be no perching structures within this area as they are used by avian predators (Dave Low, retired biologist, Ministry of Environment, pers. comm.). Burrowing owls are sensitive to disturbance; therefore, restrict all activities within 500 m of burrow sites during the active breeding season (April 1 to July 31), and limit vehicular traffic within 150 m year round.[45]

**Habitat Considerations:** Identify and maintain foraging areas, consisting of taller grasses (>10 cm) within 1 km of burrows. Adhere to range management restrictions established for wildlife habitat areas, such as no cattle grazing or hay mowing from April 1 to July 31.[46]

## LEWIS'S WOODPECKER

The Lewis's woodpecker is red-listed in B.C. and is designated as Special Concern in Canada. It is a loosely colonial species that prefers to breed in open, mature ponderosa pine forests and riparian black cottonwoods stands, but it requires open grassland areas for feeding.[47]

### *Recommendations*

**Development and Activity:** No development within 200 m of a nest tree. Lewis's woodpeckers will tolerate some human presence, but no activity within 30 m of the nest tree during the breeding season (April 15 to August 15).[48]

**Habitat Considerations:** Within 400 m of a nest tree, maintain forested areas with old, open ponderosa pine or Douglas-fir (< 25% crown closure and > 40 cm diameter at breast height [DBH]), or old, riparian, deciduous trees (e.g., aspen, but preferably black cottonwood > 45 cm DBH) adjacent to open foraging areas.[49]

## WESTERN RATTLESNAKE

The western rattlesnake is blue-listed in B.C. and is designated as Threatened in Canada. It is a venomous snake that reaches its northern distribution limit in the Thompson Basin. These snakes overwinter in dens, which are located mainly on steep-sloped rock outcrops, talus slopes, and earth-covered outcrops. The snake's summer range includes grassland, shrub steppe, riparian, and forest habitats.[50 51]

### *Recommendations*

**Development and Activity:** No development within 200 m of den sites, and restrict all activities within 200 m of den sites from March 1 to October 31. These recommendations are necessary not only for maintaining the integrity of the den site but also for protecting nearby gestating females and avoiding human-snake conflicts. In addition, no development within 200 m of potential dens identified by the predictive habitat mapping unless an inventory has determined the site is not being used by rattlesnakes.

**Roads**: No new paved roads within suitable habitats unless effective mitigation measures, such as building tunnel systems and erecting exclusion fencing, are implemented.[52] [53] Conduct adequate surveys to identify high use areas and travel routes so that mitigation measures are effectively implemented. In the absence of surveys, apply a 2-km "no development" buffer around dens.

## GREAT BASIN SPADEFOOT

The Great Basin spadefoot is blue-listed in B.C. and is designated as Threatened in Canada. It occupies grasslands, shrub steppe, and open pine forests.[54] These amphibians use both temporary and permanent ponds and lakes for breeding, and terrestrial habitats with loose, deep soils for foraging, hibernation, and aestivation.

### *Recommendations*

**Development and Activity:** No developments, including roads, retaining walls, and steep-sided trenches, within 250 m of spadefoot ponds.[55]

Restrict activities within 25 m of spadefoot ponds during the breeding season (April 15 to May 31).[56] [57] Activities near spadefoot ponds from June 1 to April 14 are also a concern.

Survey all suitable ponds to determine if they are used for breeding. However, breeding occurs only when environmental conditions are suitable, which may not happen on an annual basis. Therefore, an absence of breeding activity at a particular pond during one full season may not necessarily mean the pond is unsuitable for spadefoots.

**Connectivity**: Suitably connect aquatic and terrestrial habitats to allow spadefoots to move between seasonal habitats. Identify corridors of 25 m between habitats that are < 500 m apart.

**Roads**: Evaluate existing roads within and adjacent to priority areas to assess feasibility to implement effective mitigation measures, such as effective under the road tunnel systems (i.e., specialized culverts) with directional fencing

### *Non-focal Species at Risk*

Sightings of a number of other species at risk have been numerous and/or concentrated in the Thompson Basin. Although habitat potential for these species was not modelled, they still warrant descriptions in this portfolio due the high probability of their repeated occurrence in the mapped areas. These species include:

- American avocet
- long-billed curlew
- flammulated owl
- Williamson's sapsucker
- sandhill crane
- gopher snake
- racer

Table 6 shows the recommendations for these non-focal species outside of priority areas. These recommendations are derived primarily from the Identified Wildlife Management Strategy's *Accounts and Measures for Managing Identified Wildlife*;[58] however, the recommendations for the American avocet were derived from two other sources.[59, 60] Specific life history details for each species can be found in their respective status report produced by the Committee on the Status of Endangered Wildlife in Canada.[61]

**Table 6: Recommendations for Non-focal Species at Risk in Working Landscape Grasslands**

| Species (B.C. list status) | No Development | No Activity (date restrictions) |
|---|---|---|
| American avocet (red) | within 500 m of nest | within 50 m of nest (May 1–Sept 1) |
| Long-billed curlew (blue) | within 500 m of nest | within 50 m of nest (April 1–July 15) |
| Flammulated owl (blue) | within 200 m of nest | within 100 m of nest |
| Williamson's sapsucker, thyroideus subspecies (red) | within 200 m of nest tree | within 30 m of nest tree (April 15–September 15) |
| Sandhill crane (blue) | within 250 m of nest | within 200 m of nest (April 1–October 15) |
| Gopher snake, deserticola subspecies (blue) | within 200 m of den site | within 200 m of den site (March 1–October 31) |
| Racer (blue) | within 200 m of den site | within 200 m of den site (March 1–October 31) |

Please note that not all CDC sight records for provincially listed species in the Thompson Basin Ecosection are shown on the portfolio maps.

### *Corridors*

Connecting priority areas is vital for allowing wildlife to move between different habitats.[62] Designing corridors and other connectivity features is best done at a more local scale than that used in this portfolio; therefore, specific mapped solutions for connectivity are not provided. However, any solutions for connecting two or more priority areas should be multi-faceted and should consider the variety of animals that need to travel between these areas. In several cases, the riparian priority areas offer part of the solution for connecting priority terrestrial areas.

## USES AND LIMITATIONS OF THE PORTFOLIO

There are always limitations to interpreting data analysis. The following provides an overview of the appropriate uses and primary limitations of the priority grasslands portfolio.

| The portfolio: | The portfolio: |
|---|---|
| **is** an assessment of where some of the highest grassland values exist at the ecosection scale | **is not** a way to identify "unimportant" areas or areas where development can occur without prior ecological assessments. For instance, an area may have been ranked low due to an absence of ecological surveys or lack of data for that area |
| **is** meant to be used primarily as a guide for land use and conservation planning at a regional-scale, ~ 1:100,000 or coarser, such as first-stage community level planning to guide development and conservation of priority grasslands | **is not** appropriate for intra-neighborhood planning or other land use planning at a local scale (i.e.1:25,000 or finer) |
| **is** a guide on how priority grasslands are identified based on both ecological and socio-economic importance | **is not** a comprehensive methodology on how priority grasslands are identified |
| **is** the most complete set of conservation and stewardship options for important and suitable habitat, including corridor habitat areas, given the current state of knowledge and data for the region | |
| **is** useful for identifying non-priority grasslands that are important for connecting priority grassland areas (as stepping stones or contiguous areas) | |
| **is** a base that can be used to develop a regional-level wildlife network design, including a reserve selection analysis | **is not** a wildlife network design or a reserve selection analysis—i.e., it does not identify specific solutions for determining the location and number of core habitats and connectivity habitats needed to maintain species' population viability targets |

| The portfolio: | The portfolio: |
|---|---|
| **is** a base that can be used to evaluate metapopulation dynamics at a regional-level scale | **is not** an evaluation of metapopulation dynamics—i.e., the number of individuals of a species and connections required in a network of habitat areas to maintain the species' genetic viability and survival. This is the domain of a wildlife network design. |
| **is** appropriate as a first stage in identifying potential compatible-use/stewardship areas and more restrictive conservation areas | |
| **is** a working document. Conservation planning is iterative and adaptive. The portfolio will be adapted and changed continually over time as new data and knowledge are acquired and incorporated into the analysis | **is not** a final plan |

## ADDITIONAL BACKGROUND INFORMATION

The following provides additional details on rare ecosystems used in the priority analysis, and background information on ranching and recreation in the Thompson Basin Ecosection.

### RARE ECOSYSTEMS IN THE THOMPSON BASIN

The following rare ecosystems were used in the analysis. They were either already mapped, or were mapped using aerial photography or based on expert input:

- giant wild rye
- wetlands
- **alkaline** ponds
- aspen and cottonwood
- old growth management areas

#### *Giant Wild Rye*

Giant wild rye is a red-listed plant community that occurs throughout the Thompson Basin.[63] This moist grassland variant (BGxw1 /07) occurs on toe slopes, level areas, and depressions on **lacustrine**, **morainal**, and **fluvial** materials.[64] Shrubs, mosses, and lichens are typically absent; common herbs include common dandelion and rush. Although scarce, giant wild rye has the distinction of being a tall grass in this ecosection, reaching more than 2 m in height. Sites were mapped primarily based on expert input.

#### *Wetlands*

Wetland habitats are critical components of naturally functioning ecosystems at the landscape level, especially in arid land ecosystems such as those found in the Thompson Basin.[65, 66, 67] Wetlands comprise only a small area within the Thompson Basin grasslands. Generally, they occur on flat to gently sloping terrain and are dominated by grasses, sedges, and forbs. All wetland types—predominantly cattail and bulrush marshes in this ecosection—were treated in the same manner in this project[68] Wetlands are included in the standardized base mapping that has been done for the entire province.

#### *Alkaline Ponds*

Alkaline ponds occur infrequently in the Thompson Basin. They are usually characterized by distinct vegetation zones from the edge of the lake outwards. Alkali saltgrass is usually the dominant herb, but alkali cordgrass, sedges, and Nevada bulrush are often common associates.[69] On sites where alkali saltgrass is not the dominant vegetation, maritime or red glasswort forms a scarlet band between the upland vegetation and pond bed. The alkaline soils associated with these ponds are the result of centuries of water draining into the ponds and then evaporating in summer, leaving salts (alkali) behind. The band of white salts around the pond is a defining characteristic which facilitated the identification of this ecosystem in aerial photographs.

### *Aspen and Cottonwood*

Aspen and cottonwood forests in the Thompson Basin are found along the entire elevational gradient from river valley bottoms to the upper grasslands. Cottonwood forests are most common in the lower grassland and ponderosa pine variant along the floodplains of the Thompson River and its tributaries. In the lower grasslands, black cottonwood, trembling aspen, and paper birch form a mixed canopy over a dense understorey of Douglas maple, red-osier dogwood, and common snowberry.[70] In the middle and upper grasslands, aspens are found on cool aspects and in moist swales and depressions, and are characterized by various-aged trees with a near closed to open canopy. The understorey is usually dominated by rhizomatous grasses and occasionally shrubs. Aspen and cottonwood are included in the standardized base mapping that has been done for the entire province.

### *Old Growth Management Areas*

Old growth management areas are spatially-defined areas of old-growth forest that are identified during landscape unit planning or operational planning. These areas provide information needed by forest companies to meet their legal planning requirements for retaining old-growth forests under the *Forest and Range Practices Act*. Forest companies are not required to use the mapped areas, but they may choose to manage required old-growth biodiversity targets in other ways. The old-growth management areas for the Kamloops Timber Supply Area are current to July 2007.

### *Other Ecosystems*

In addition to the previously mentioned ecosystems, a number of rare and CDC-listed ecosystems were mapped based on expert input. They are referenced in the Area Summaries.

## SPECIES AT RISK

Several species at risk in the Thompson Basin use grasslands habitats. Although none occur exclusively in the Thompson Basin, a few reach their northern distribution limit here. The Thompson Basin has 72 plants and 50 animals that are either red- or blue-listed in B.C. [71] The priority analysis included records and predictive habitat modelling for six focal species, which resulted in mapping important and suitable habitat for them. The maps in this portfolio feature the blue-listed flammulated owl, a species at risk that does not occur in grasslands but occurs in adjacent forest. This species is mapped but is not included in the priority analysis.

## POTENTIAL THREATS TO PRIORITY AREAS

A multitude of threats – from invasive weeds to forest encroachment to housing developments – affect the survival of the priority areas identified in this analysis. Although the potential impacts of these threats are difficult to assess, models were developed to predict the impacts of urban and intensive agricultural development. The results of these models are available from the GCC upon request. This information can be

used in local strategic planning by municipalities, the Agriculture Land Commission, and other government departments. Further refinements to the analyses will be integrated into future editions of this portfolio.

### RANCHING IN THE THOMPSON BASIN

Ranching in the Thompson Basin is an efficient way of acquiring food from the land. Historical attempts at intensive crop agriculture (outside of the valley bottoms) in the region failed, largely due to high labour requirements and the excessive cost of irrigation in this arid environment.

The dominant vegetation of both the Thompson Basin and B.C.'s interior grasslands is bunchgrass. Several species of bunchgrass occur in the Thompson Basin. They form a readily available, nutritious forage for cattle and other livestock. The cost of maintaining pastures in native vegetation is far less than the alternatives of moving cattle to off-site feedlots or shipping feed to the home ranch. Accessibility to large tracts of native forage is a key to maintaining the economic viability of ranches.

Ranches located within the priority areas will make an important contribution to grassland conservation and stewardship. However, ranches located outside of those areas will also help by providing habitat stewardship and connectivity between priority areas, and by collaborating with ranches within the priority areas. Although ranches operate independently, they support the viability of other ranching operations by sharing resources.

*The first map in the "Supplementary Maps" section shows the location of Crown Range Management Units and active Ministry of Forests and Range grazing tenures within the Thompson Basin. The boundaries for these areas are shown in relation to private and public lands and to the priority areas identified in this portfolio.*

### RECREATION AND CULTURE IN THE THOMPSON BASIN

Recreation is the basis of tourism and other economic ventures in the Thompson Basin region. Land use planning and development application approvals must consider potential impacts to both recreation and cultural values. First Nations' archaeological and cultural sites within and near the priority grassland areas are identified and mapped in this portfolio (see Priority Area Summaries). Wherever possible, notes about traditional and current use of the land by First Nations people have been included. Even so, this provides only a limited perspective on the extensive use of grasslands by First Nations peoples, past and present.

*The second map in the "Supplementary Maps" section shows some of the recreational features of the Thompson Basin that require special consideration during proposed land development. Area summary descriptions provide further site-level details for recreation and cultural values.*