4 SAMPLE Plans

CASA DEL MELL ORCHARD AND T BAR K RANCH

This section contains two sample Biodiversity Management Plans. The first is for Casa Del Mell Orchard and was developed Ken and Melhina Thibault and prepared by Planning Advisor Joe Lariviere. The second plan is for the T bar K Ranch and was developed by Karen Wilson and Ted Sikora and prepared by Planning Advisor Peter Spenser.

The plans have been edited for brevity and are intended to provide an example to help the users of this guide complete a plan. Much of the resource material has been identified but not included. Full versions of the plans can be accessed on the Agriculture Research and Development Corporation's (ARDCorp) website at http://www.ardcorp.ca/index.php?page_id=39

Bat house located on the Casa Del Mell Orchard

Available forage found on roads and landings of the T bar K Ranch

ENVIRONMENTAL
FARM PLAN

Biodiversity Management Plan

Casa Del Mell Orchard

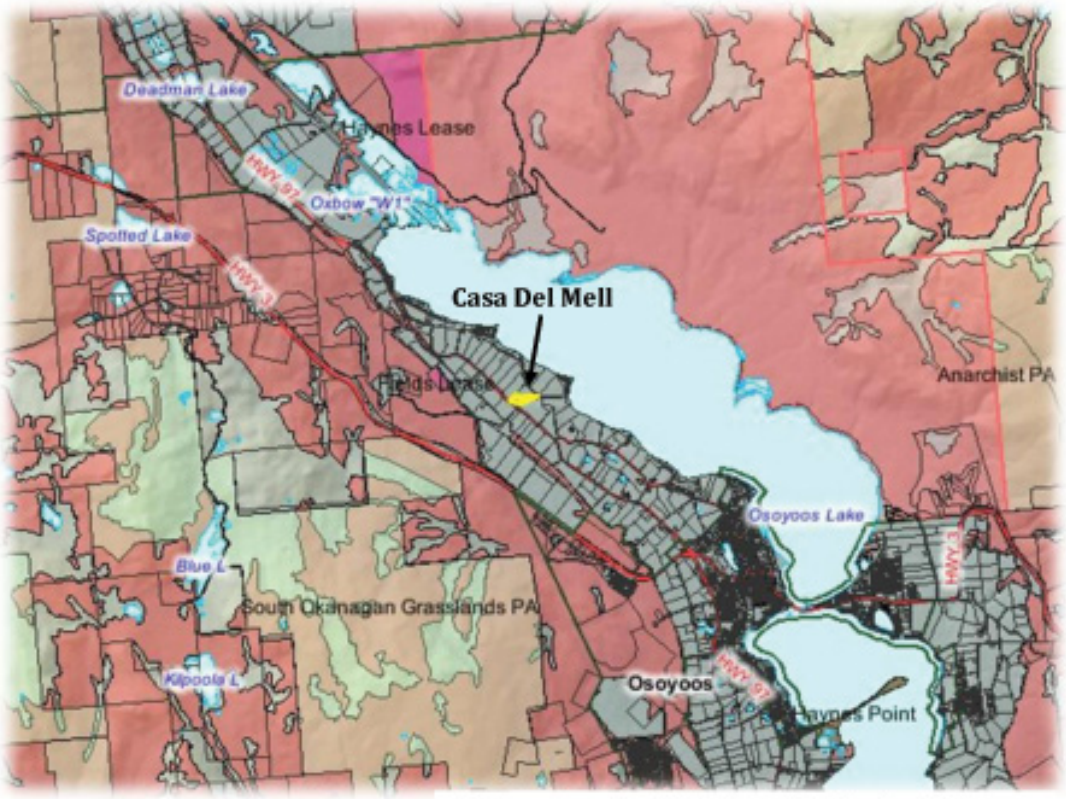
Biodiversity Management Plan

Casa Del Mell Orchards March 2010

1. General Location

Casa Dell Mell Orchard is located near the southern extent of British Columbia's Okanagan Valley at 119˚ 30' 17" W 49˚3' 19" N. The farm is 3 kilometres north of the junction of Hwy 97 and Hwy 3 and is within 6 kilometres of the Canada – U.S. border.

There is an underground drainage system that makes a surface expression at the eastern edge of the property. The total area of the property is 2.02 hectares and is bounded by orchards to the north, Hwy 97 to the west and 148th Avenue to the south and east. Orchards and vineyards are directly adjacent to these roadways. The wetland habitat forms the primary focus for biodiversity opportunities. Casa Del Mell Orchard is located in the Bunchgrass biogeoclimatic zone as well as the antelope-brush ecosystem.



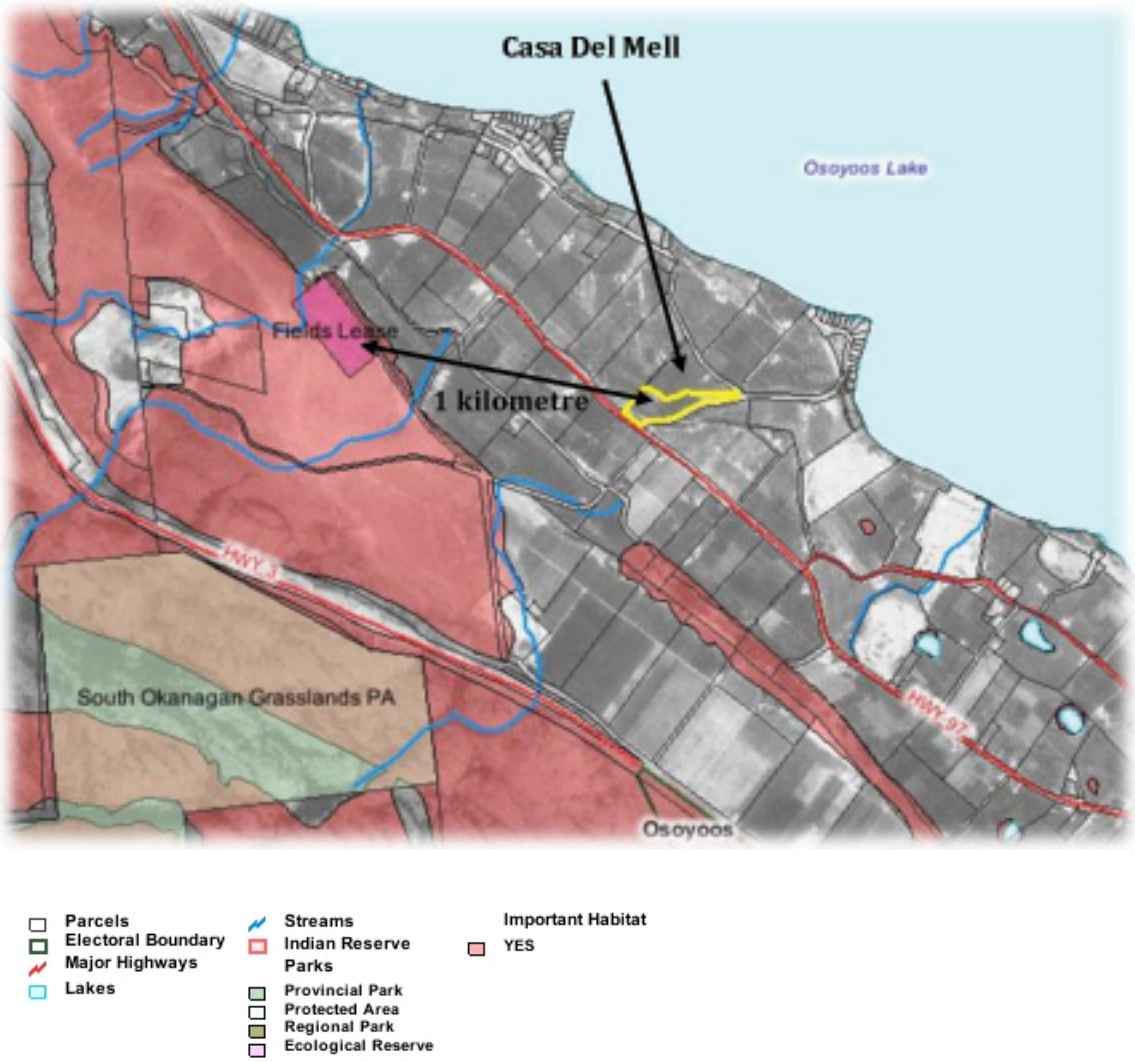
★All maps are orientated with north at the top of the page

Parcels
Electoral Boundary
Major Highways
Lakes
Indian Reserve
Parks
Provincial Park
Protected Area
Regional Park
Ecological Reserve

2. Products Produced

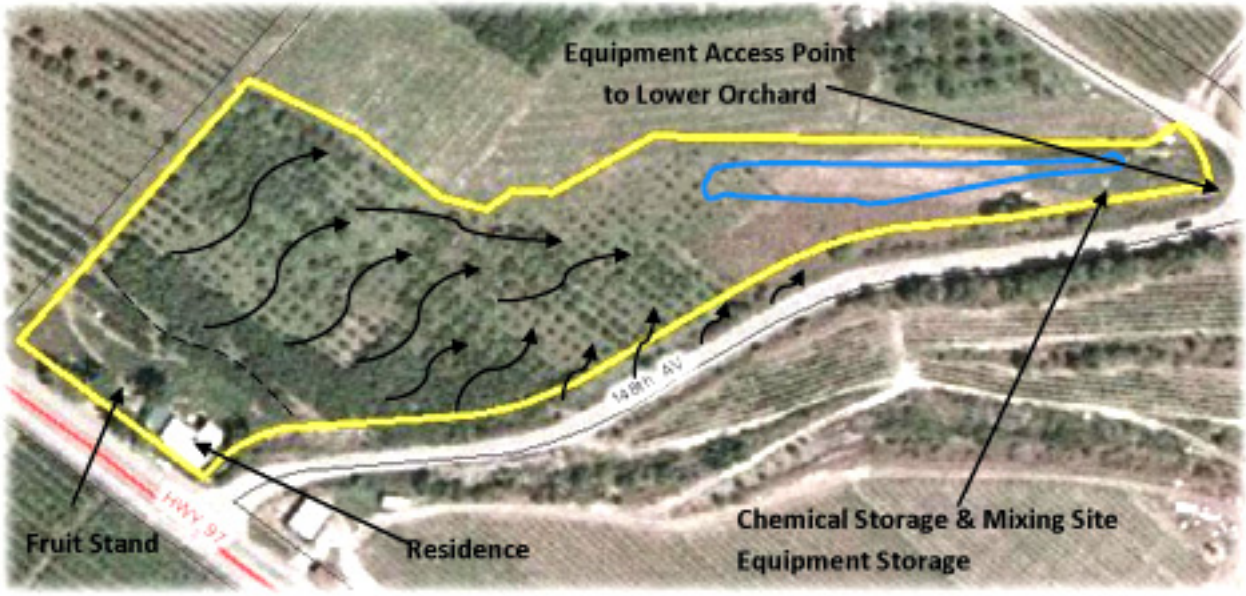
The farm grows a variety of tree fruits: apples, cherries, peaches, apricots, and plums. Produce is sold either directly to local to markets or through U-pick operations on the farm. All farming activities are primarily managed directly by the resident landowners, Ken and Mellhina Thibault.

3. Site History and Management Practices



As seen on the above map, Casa Del Mell is located in proximity to a number of recognized Environmentally Important Habitats. Riparian areas of Osoyoos Lake are within 350 meters. Field's Lease Ecological Reserve and the Osoyoos Desert Centre are within 1,000 metres. Portions of the South Okanagan Grasslands Protected area are within 1,100 metres, while other recognized sensitive wildlife habitats on private land are within 400 metres of the property.

Casa Del Mell Orchard



- All maps are orientated with north at the top of the page
- The 2-hectare property measures 123 metres north to south and 368 metres east to west along its maximum lengths

There is a small wetland area located on the easternmost reach of the Casa Del Mel property, and it was in poor health until the spring of 2008. The area had been somewhat in-filled with dumped garbage and pruning wastes prior to the Thibault's ownership. The pond was lacking surface expression of water, and very few native plants were present.

Historic and anecdotal evidence suggests that the land to the west of Highway 97 used to be marshy until it was drained via a series of sumps and underground drainage pipes in the late 1960's. While there is no direct evidence available to determine the exact area of the previous marsh, the green area on the above map is an approximation of its original extent.

In cooperation with The Land Conservancy's (TLC) South Okanagan – Similkameen Stewardship Program and Conservation Partners, Puddles for Peepers, the South Okanagan Similkameen Community Bat Project and the Environmental Farm Plan (EFP), efforts were undertaken to rehabilitate the wetland. These stewardship groups are in the process of putting together a report that will define the project objectives as well as ongoing maintenance and monitoring activities that will be required to bring the area back to a healthy, natural and functioning state.

Soils on the property vary significantly from the upland areas along Highway 97 to the lowland areas near the intersection of 148th and 89th Streets. Generally speaking soils are typical of the area and low in organic content. Soils range from coarse-grained, gravelly loam on upper elevations to finer grained, sandy loam with higher silt content on lower elevations. Moisture-holding capacities of the soils are poor.

Irrigation water use on the farm is relatively well managed. Micro sprinklers are used as a water conservation measure. However, due to the low moisture-holding capacity of the soils, irrigation management is a challenge.

Casa Del Mell completed an EFP in the spring of 2007. The farms practices of fuel, fertilizer, and pesticide storage, mixing, and use are in compliance with regulations and EFP recommendations. The farm employs sound Integrated Pest Management (IPM) practices and makes efforts to keep abreast of new and emerging issues.

The crops' nutrient requirements are determined with the assistance of soil sample analyses, which are done on a regular basis. Chemical fertilizers are used to supply crop nutrients. A combination of both ground and foliar application methods are used.

Weed management is reliant on a combination of herbicides, mechanical removal, and cultural controls. Cultural controls include maintaining vegetative ground cover and using biological controls. Noxious weeds are plentiful in the area, both in terms of variety and abundance.

The farm property is unfenced, and wildlife is regularly encountered on the farm.

4. Habitat Communities

The South Okanagan – Similkameen is a unique region of Canada. It is recognized provincially and nationally as a biodiversity hotspot and for its richness and rarity of species and habitats. The region is also an important ecological corridor between the arid Columbia Basin and Great Basin to the south and the grasslands of the Central Interior of BC.

The South Okanagan – Similkameen is renowned for having one of the highest proportions of the country's species and ecosystems that are considered at risk. It is also one of the fastest growing areas in the country.

- More than 93% of natural areas of the Okanagan River have been lost.
- More than 84% of wetlands have been lost.
- 70% of big sagebrush and antelope-brush habitats have been lost.
- Less than 40% of gentle slope grasslands and shrub-steppe remain.

Casa Del Mell is located within the Bunchgrass biogeoclimatic zone. In a regional context, the area is within the antelope-brush Shrub Steppe ecosystem, which is recognized as being critically endangered.

Grasslands in BC cover only 1% of the province but contain 40% of the province's species at risk according to the federal government's Committee on the Status of Endangered Wildlife in Canada (COSEWIC). The South Okanagan – Similkameen grasslands are among the top four most endangered ecosystems in Canada, and the antelope-brush ecosystem is critically imperilled.

Terrestrial species richness in the South Okanagan is amongst the highest in the province and is estimated to be in the range of 558 to 840 species. Similarly, the density of species and the number of priority sites are among the highest in the province.

See the Environmental Farm Plan's "Planning for Biodiversity – A Guide for BC Farmers and Ranchers" for maps and information that reference:

- *Biogeoclimatic Ecosystem Classification*
- *Species Richness – Terrestrial*

Within the area of the South Okanagan, there are more than 100 species at risk. Some of the species at risk that could be found in the area of the farm and surrounding habitats include:

Amphibians and Reptiles

Tiger Salamander
Great Basin Spadefoot Toad
Painted Turtle
Rubber Boa
Racer
Gopher Snake
Night Snake
Western Rattlesnake

Birds

American Bittern
Great Blue Heron
Sandhill Crane
Long-billed Curlew
Prairie Falcon
Flammulated Owl
Western Screech-Owl
Short-eared Owl
Lewis's Woodpecker
White-headed Woodpecker
Canyon Wren
Sage Thrasher
Yellow-breasted Chat
Brewer's Sparrow
Lark Sparrow
Grasshopper Sparrow

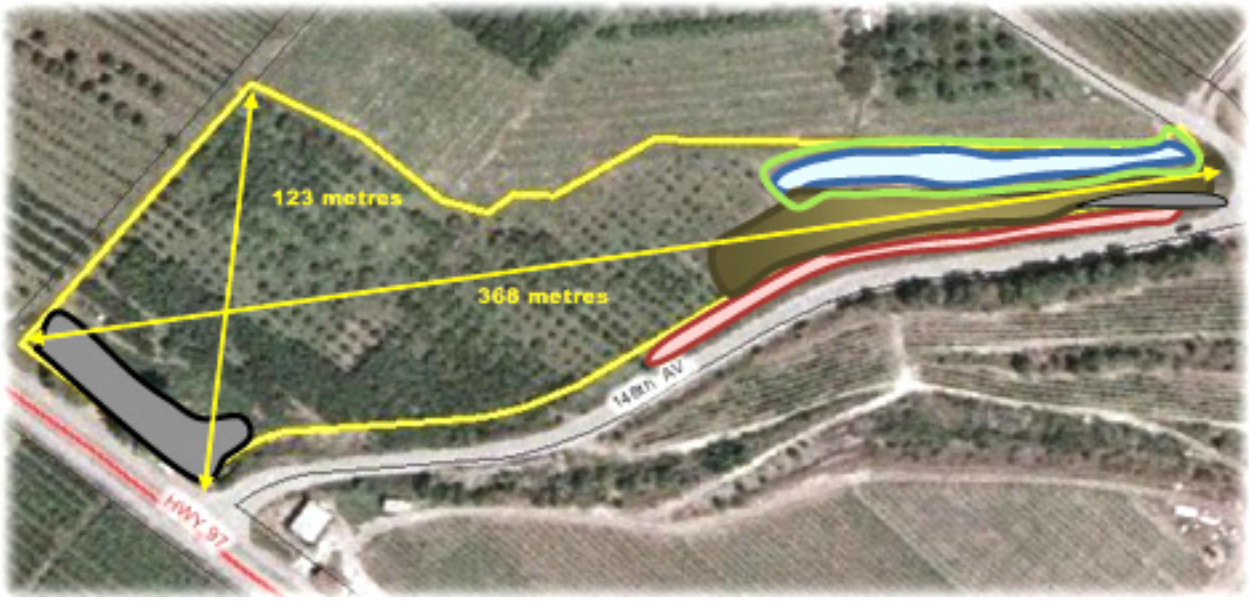
Mammals

Fringed Myotis
Western Red Bat
Spotted Bat
Townsend's Big-eared Bat
Pallid Bat
Badger
California Bighorn Sheep
Great Basin Pocket Mouse
Cottontail Rabbit

Plants

Grand Coulee Owl Clover
Showy Phlox
Annual Paintbrush

Map Showing Habitat Communities within the Casa Del Mell Property



Buildings And Roads Occupy 1,450 square meters or 6.5% of the Total Area
Wetland Habitat Occupies 860 square meters or 4% of the Total Area
Purposed Annual Crop Area Occupies 2,400 square meters or 10% of the Total Area
Steep Upland Linear Habitat Occupies 800 square meters or 4% of the Total Area
Orchard Area Occupies 1.5 Hectares or 73% of the Total Area
Riparian Habitat Occupies 540 square meters or 2.5% of the Total Area

Natural habitat is lacking within the farm boundaries. All areas of the farm have been affected by development and disturbance.

Wetlands occupy only 0.3–0.7% the land area within the Bunchgrass and Ponderosa Pine biogeoclimatic zones. Due to development, 85–90% of the wetlands in the Oliver/ Osoyoos area have already been lost. So despite the small size of the wetland on the Casa Del Mell property, it has been identified as critical breeding habitat for both Great Basin spadefoot toads and tiger salamanders. Both species are listed as endangered.

The aquatic and riparian areas will be the focus of biodiversity activities on the farm. As this area is in the process of being re-established, there is no historical reference to predict seasonal surface water availability or expression. The aquatic feature may be re-classified as a wetland depending on the natural fluctuations of water availability.

By acquiring a more comprehensive understanding of the life cycles of the likely inhabitants of the wetland, the landowners will positively contribute to the successful re-establishment of the biodiversity opportunity presented by the wetland.

Aquatic

The pond located at the eastern corner of the property measures approximately 30 meters by 3 meters. This is the surface expression of an underground drainage system that has been extremely altered from its natural state due to intensive agricultural practices both on the farm and upstream beyond the property boundaries.

Until the spring of 2008, the wetland had not experienced a surface expression of water for several years due to previous infilling.

Riparian

Currently, the riparian habitat is lacking. Native vegetation was planted in the spring of 2008, but there has been a high rate of plant mortality, and the surviving plants are very immature. Weeds have out-competed the native plantings. Establishing a healthy ecosystem will be an ongoing process. It is hoped that the riparian habitat will become host to a number of threatened and endangered species ranging from plants to invertebrates, birds, and small mammals.

Other Habitat

Other native habitat is absent from the farm, but there is a narrow strip of undeveloped land along the steep roadside embankment in the southeast corner of the property that is vegetated with grasses that are providing bank stabilization. This linear habitat may also provide refuge for species that are attracted to pond and riparian areas. Dogwoods have been planted in this area to enhance habitat. Invasive species ranging from Siberian elm to knapweed are also present. Ongoing weed management will be required to rehabilitate this area.

Orchard

The irrigated area of the orchard can be host to moisture, shade, succulent new vegetative growth, ripe fruit, leafy foliage, and grass. The availability of these elements within the vineyard setting can be in sharp contrast to the available resources in the adjacent native wildlife habitats, and therefore can act as strong attractants for many wildlife species. Native wildlife habitat loss and habitat fragmentation in the region also contribute to the presence of wildlife on the farm.

The orchard can provide alternative habitat to a number of wildlife species, including some endangered species, and arguably contributes to the biodiversity of the landscape. While there can be benefits to agricultural production stemming from the presence of wildlife within the agricultural landscape, it is also recognized that the agricultural environment can act as a "sink" for wildlife, which does not allow them to complete their natural life cycles. Additionally, wildlife is often in conflict with agricultural production. Negative impacts to both wildlife and agricultural production need to be considered when exploring opportunities to develop greater biodiversity within or adjacent to the agricultural landscape.

5. Specific Habitat Goals

Aquatic and Riparian Habitats

This habitat will benefit from the development of an aquatic and riparian management plan. The foundation of this management plan will be provided by the report that is being prepared by the conservation partners involved in re-establishing the pond. Further refinement of this plan, alongside increased awareness and understanding of the related habitat and species issues on the part of the landowners, is recognized as an integral part of a successful management plan.

Local conservation organizations like The Land Conservancy (TLC), South Okanagan-Similkameen Stewardship Conservation Program (SOSCP), Okanagan Similkameen Conservation Alliance (OSCA), alongside the Ministry of Environment are recognized as sources of information and assistance.

In addition to the wetland habitat rehabilitation project, Casa Del Mell seeks to improve awareness of issues involving species at risk among staff, neighbours and farm visitors with the objectives of increasing sensitivity and modifying farm management practices that can negatively affect species at risk.

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Issues for consideration when developing the management plan for the wetland area includes the following:

1. Pond Shape and Soil Stability

Of risk to the recently re-established pond is infilling by sedimentation. Benchmark monitoring stakes will used to determine the rate of infilling. Depending on the monitoring results, mitigating strategies such as a sedimentation trap located on the upstream side of the pond, varied or increased vegetative plantings or runoff diversion channels will be considered.

2. Vegetation Structure

Ongoing monitoring will be required to assess the success of vegetative plantings. A photo monitoring plot will be established to record this process at regular seasonal intervals. The landowners commit to acquiring a more complete understanding of the native plants that are considered desirable to the wetland. They will continue to evaluate the ecosystem development to better assess its overall health and functionality. Indicators of reduced ecosystem functionality will be monitored. These include structural changes such as loss of low shrub layers, re-sprouting, clubbing, and highlining.

3. Soil Structure

The damp and fine-textured soils of the wetland area are readily impacted by soil compaction. Restricting vehicle traffic from the riparian zone and limiting vehicle traffic to the areas adjacent to the riparian area to drier times of year will serve to reduce the risk of soil compaction.

4. Water Nutrient and Salinity Levels

During the first year after the pond was re-established, algae blooms were noted. There is, therefore, concern that nutrient loading of the aquatic zone may be occurring. The source and extent of potential nutrient loading is undetermined at this time. Eutrophication of the pond is not desirable for enhancing the richness of biodiversity opportunities associated with the pond.

For example, water quality is important for successful insect or invertebrate breeding, which will contribute to the viability (food source) of desirable wetland inhabitants such as the aquatic stages of the tiger salamander and spadefoot toads, as well as birds and bats.

Water quality will, therefore, be monitored for indicators of nutrient loading. As the source of nutrient loading is suspected to be occurring upstream, beyond the boundaries of the farm property, opportunities to reduce contributing factors are limited. The source is suspected to be the over-application of chemical fertilizers on upland farms.

Mitigation strategies that will be considered include the selection of plant species that fix or consume nutrients, and the seasonally timed addition of fresh water to the pond so as to avoid the accumulated concentration of nutrients and salts due to evaporative water loss.

5. Wildlife

As the aquatic and riparian areas of the farm become developed, it is anticipated that an increasing array of wildlife will be attracted to the area. Considering the small size of this area and the neighbouring agricultural activities, the potential for wildlife conflicts is significant. Careful planning can minimize negative wildlife impacts on both the farm and neighbouring properties.

For example, the water in the pond may attract large flocks of birds, which may be considered a pest or result in unacceptable levels of crop damage to neighbouring orchards and vineyards. The installation of a raptor roosting or nesting site may encourage raptors to occupy the area, which in turn would limit less desirable bird species. Similarly, encouraging bats to occupy the area would limit mosquito populations and therefore the potential nuisance to neighbours.

The interplay of habitat and occupancy will need to monitored in order to fully develop a management strategy in which environmental objectives are met while at the same time wildlife conflicts are minimized.

Again considering the relatively small size of the native habitat area there is a limited capacity to support biodiversity. It is therefore recognized that the potential for conflicts between wildlife species that may be attracted to, or that become established in, the riparian area exists. The presence of one wildlife species may have negative impacts on the success of another. For example, deer may trample nests of ground-nesting bird nests or graze on rare plants (killing them, stunting their growth, or not allowing them to go to seed).

Threatened or endangered species, alongside those considered to beneficially contribute to agriculture will be favoured. Through continued monitoring, management practices such as the construction of exclusion fencing or the removal of attractants will be considered.

6. Connectivity

The watercourse has only intermittent surface expression. This wetland area is isolated from others in the area. These factors, alongside the intensity of agricultural activities in the surrounding area, leave no practical opportunity to increase the connectivity of the aquatic or riparian areas either within or beyond the farm property boundaries. The wetland on the farm property is the northwestern-most extent of a wetland that extends southeast from the farm to Osoyoos Lake.

However, through neighbourly communication and engaging in community awareness programs, the importance of these fragmented habitats and ecosystems will become better understood, appreciated, and protected. The farm will continue to work in cooperation with neighbours and conservation groups to identify significant habitat features that have become fragmented and will work to enhance or restore their key attributes, where possible.

7. Species at Risk

Retaining and enhancing habitat for species at risk and regionally sensitive or threatened species is considered a goal for this farm. The first step is to inventory what red- and blue-listed species are present and what species could be attracted if suitable conditions and requirements were met. Information will be attained through contacts with the Conservation Data Centre, the Biodiversity Centre for Wildlife Studies, the Osoyoos Desert Centre, and other organizations that have an interest in biological diversity and conservation in this region. Further steps can then be taken to establish management plans for such species as Yellow-breasted Chat, tiger salamander, and Great Basin spadefoot toad.

8. Biodiversity within the Agricultural Landscape

While Casa Del Mell employs Integrated Pest Management (IPM) practices, it is recognized that IPM management is ongoing in its development and evolution. To that end, Casa Del Mell is looking to experiment with incorporating native plantings alongside or adjacent to orchard plantings with the goal of providing desirable habitat for beneficial insects. Desirable habitats and attributes include breeding or overwintering sites, host sites that will not be exposed to chemical controls, prolonged or sequenced bloom to attract pollinators, and alternative food sources or host sites for predators so that a more permanent resident population of beneficial insects is maintained even when pest pressures are low.

Casa Del Mell is also considering planting annual ground crops the goal of both adding to the biodiversity of farm produce and achieving greater control over the potentially negative impacts to the wetland area that can arise from conventional tree fruit management practices.

Specific goals for restoring and protecting the aquatic and riparian habitats include:

❑ Re-plant and re-seed aquatic plants with site appropriate native species
❑ Re-plant degraded pond side areas with site appropriate native species
❑Create habitat recruitment structures for amphibians using large woody debris within and along the sides of the pond
❑Erect nest boxes to encourage riparian utilization by cavity nesting birds
❑Erect roosting and/or nesting platforms to encourage raptor presence
❑Plant native grasses along the edge of the riparian plantings to facilitate a larger buffer zone
❑Plant native trees and shrubs along road verge embankment to create upland refuge and habitat for both birds and migratory amphibians that may utilize the aquatic and riparian areas
❑Monitor bat house for occupancy; monitor temperature to insure proper colour, ventilation, and orientation
❑Monitor water quality for nutrient loading in excess of the ecosystem requirements
❑Monitor water quality for salinity levels
❑Monitor water levels and temperatures
❑Monitor the ingress of alien and invasive weed species and remove them before they become established
❑Establish photo monitoring sites and document development

Bat house located on the south side of the pond

Habitat Goals beyond the Wetland

Soils

Soils on the casa Del Mell are typical of the South Okanagan, containing little organic material. The moisture holding capacity of the soils is low and irrigation management is critical. The farm is seeking strategies to address issues of reducing evaporative moisture losses from the soils, and improving soil health and biodiversity through soil amendments.

Smoke resulting from orchard removal burning

Adding organic material to the soil either in the form mulch or compost is extremely desirable, but securing local sources presents major practical and economic hurdles. The region has identified smoke reduction as a priority and local soils could benefit greatly from the addition of chipped trees resulting from orchard removal.

Portable tub grinder chipping fruit trees resulting from orchard removal

Yet the community infrastructure is lacking to coordinate and facilitate these mutually beneficial goals.

Casa Del Mell would be supportive of a regional chipping program because such an undertaking is not economically feasible for individual property owners.

Integrated Pest Management

While Casa Del Mell employs Integrated Pest Management (IPM) practices, it is recognized that IPM management is ongoing in its development and evolution. It is also recognized that one of the consequences of the trend toward expansion of agricultural monocultures, such as vineyards, is the loss of habitats for natural enemies, which results in increased pest problems.

Casa Del Mell is interested in experimenting with incorporating native plantings and/or alternative crops alongside or adjacent to crops with the goal of providing desirable habitat for beneficial insects. Desirable habitats and attributes could include breeding or overwintering sites, host sites that will not be exposed to chemical controls, prolonged or sequenced bloom to attract pollinators, and alternative food sources or host sites for predators so that a more permanent resident population of beneficial insects is maintained even when pest pressures are low.

By using native plants as a means of improving IPM, there is also potential for overlap between IPM objectives and habitat enhancement objectives for wildlife species.

Casa Del Mell is pursuing sources of information to become more familiar with new and established practices. As an example, see the attached paper titled "Perennial Plant List to Increase Biodiversity in Area Vineyards" by Tom Darnel. While lacking a regional context, it outlines a number of relevant issues, strategies, and suggested plant types.

Native wild rose species appear to act as an early indicator for powdery mildew and provide overwintering resources for the parasitic Anagrus wasp, which acts as a biological control of grape leafhoppers.

Ladybugs can be an effective control for aphids, and artichokes can act as an alternative host site that will help keep ladybugs resident on the farm.

Several species of bees and butterflies utilize snow buckwheat as a food source.

Supporting Documents

A number of supporting publications relevant to the various ecosystems and endangered species touched upon in this Biodiversity Plan are considered to be part of the completed Plan and can be found at the back of this document. They include:

- *The Ecology of the Bunchgrass Zone*
- *Antelope Brush Ecosystems*
- *Wetlands of the Southern Interior Valleys*
- *Cottonwood Riparian Ecosystems of the Southern Interior*
- *Grasslands of the Southern Interior*
- *Great Basin Spadefoot Toad*
- *Painted Turtle*
- *Rare Grassland Plants*
- *Rare Invertebrates of the South Okanagan*
- *Spotted Bat*
- *Western Rattlesnake*
- *Recovery Strategy for the Tiger Salamander (*Ambystoma tigrinum*), Southern Mountain Population in British Columbia*
- *Recovery Strategy for the Western Rattlesnake (*Crotalus oreganus*) in British Columbia*
- *Recovery Strategy for the Gopher Snake,* deserticola *Subspecies (*Pituophis catenifer deserticola*) in British Columbia*
- *Recovery Strategy for the Great Basin Spadefoot (*Spea intermontana*) in British Columbia*
- *Spot Light on Species – Antelope Brush: Okanagan Old Growth Critically Imperiled*
- *Spot Light on Species – Riparian Areas: Where Water Meets Land*
- *Spot Light on Species – Okanagan Amphibians at Risk: It Ain't Easy Being Green*

TABLE 3 ACTION PLAN WORKSHEET

List the assessment questions that you scored as Considerable Opportunity or Some Opportunity and which you want to take action on. Using the BMP list, select the BMPs that you want to implement on your land. Set goals that are specific to the BMPs and what you want to achieve in your operation. Determine what you will monitor and when to check if your goals are being met. See the Sample Biodiversity Management Plan section of the guide for an example.

FARM NAME/AREA: CASA DEL MELL	DEVELOPED BY: Ken and Mellhina Thibault	DATE DEVELOPED: March 2010	PAGE 1 OF 2

Question to Be Acted Upon	Proposed BMP or BMP Practice Code	Specific Goal(s) Related to BMP(s)	Proposed Monitoring		Date Completed, Approvals or Permits Required, and Other Comments
			When	What	
#1 Riparian Enhancement	**1.1** Riparian Management Plan	Have plan developed by conservation partners			Check for any approvals of permits required.
	1.4 Retain Native Plants	Nurse immature plants to independence	Ongoing	Health	
#3 Aquatic Habitat Enhancement	**3.4** Natural Cycles	Allow to occur and modify farm practices to accommodate as necessary	Ongoing	Developments	
	3.5 Maintaining Habitat	Nurse newly established area to independence	On-going	Health	
	3.14 Enhance Canopy Development	Nurse immature plants to independence	Ongoing	Health	
#8 Grassland Enhancement	**8.7** Restore Native Species	Replant new communities as required	Ongoing	Survivability	
#11 Wildlife Habitat Enhancement	**11.1** Identification of Important Native Habitat	Improve awareness and identification skills	Ongoing	Presence	
	11.2 Install Bird Boxes	Nesting boxes in riparian area and property margins			

TABLE 3 ACTION PLAN WORKSHEET

List the assessment questions that you scored as Considerable Opportunity or Some Opportunity and which you want to take action on. Using the BMP list, select the BMPs that you want to implement on your land. Set goals that are specific to the BMPs and what you want to achieve in your operation. Determine what you will monitor and when to check if your goals are being met. See the Sample Biodiversity Management Plan section of the guide for an example.

FARM NAME/AREA: CASA DEL MELL	DEVELOPED BY: Ken and Mellhina Thibault	DATE DEVELOPED: March 2010	PAGE 2 OF 2

Question to Be Acted Upon	Proposed BMP or BMP Practice Code	Specific Goal(s) Related to BMP(s)	Proposed Monitoring		Date Completed, Approvals or Permits Required, and Other Comments
			When	What	
#11 Wildlife Habitat Enhancement	**11.8** Nesting And Perch Sites	Install perch site			
	11.9 Large Trees	Nurse immature plants to independence	Ongoing	Health	
	11.12 Restore Buffer	Nurse immature plants to independence	Ongoing	Health	
	11.23 Growth Of Native Vegetation	Avoid disturbance of natural ingress	Ongoing	Presence	
#12 Alien Species	**12.1** Identify Weeds and Invasive Plants	Improve awareness and identification skills	Ongoing	Presence	
	12.2 Management Strategy	Continued refinement / evolution	Ongoing	Success and Failure	
	12.3 Restore Native Plants	Replant new communities as required	Ongoing	Survivability	

Biodiversity Plan

Developed for

T bar K Ranch

Chase BC

Companion Document to a
Environmental Farm Plan

Funded by
Agriculture and Agri-Food Canada
BC Ministry of Environment
Ducks Unlimited Canada

Prepared by
Pete Spencer
EFP Planning Advisor

March 2010

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T bar K Ranch

1. General Location and Description

The ranch is located southeast of Chase BC in an area called Turtle Valley. The BC Water Resources Atlas Mapping site shows two watercourses on the property; however, there is no surface water flow in these drainages with the possible exception of spring snow melt. The valley generally drains into Chum Lake, which is about 1.7 km from the subject property. Chum Lake is drained by Chum Creek,, which flows into Little River and subsequently into Little Shuswap Lake and the Thompson River system. There are three springs on the property: Lafferma, Surplice, and Smith Spring, which has been developed into a pond.

The deeded property is about 65 hectares with leased land and Crown grazing making up the rest of the management unit. The ranch is bordered by Crown land on the north and south, and deeded property to the east and west.

There are three main habitat types on the property dictated by slope, soil, and aspect. On the north, the land is steep, rocky, and south facing. The valley bottom is flat with silty loam soils that have lenses of clay and a sand/gravel mix. The south has a gentler slope, with coarser soils than the valley bottom, and is north facing.

The present owners have had possession of the property for less than a year and plan many changes.

2. Products Produced

This is a commercial cow/calf operation which presently has 35 head of mature beef cattle and some horses. Perennial forage is grown and stored as hay, and livestock are pastured on a mix of Crown range and tame pasture. The perennial forage areas are irrigated from Smith Spring pond.

3. Habitat Communities

Of the three main habitat communities found on this property the largest is tame perennial forage. Both the hay field and pastures are mostly mixed grasses with some legumes. The hay fields are used for fall grazing and overwintering. This helps distribute manure economically as opposed to feeding in pens. Extensive rejuvenation of existing forage fields is planned.

The second largest community is a mixed needle leaf forest with some deciduous trees and a north aspect, part of which has been selectively logged for cedar in the past. (see biogeoclimatic zone data, north side of valley)

The third largest community is an area with Douglas-fir, ponderosa pine, shrubs, and native grasses, and a southern aspect. (see biogeoclimatic zone data, south side of valley)

Within this area there are also vertical rock faces with talus slopes, which could be home to the western rattlesnake.

There is a small but significant linear habitat to the north and west of the corral system.

There are three small riparian areas around the springs and pond.

4. Wildlife

In the short time that the present owners have been on the property, they have identified and photographed a wide variety of wildlife species on the property, including deer, bear, coyotes, Great Blue Heron, and numerous ducks. (see species images)

5. Specific Habitat goals

Riparian

The three riparian zones are limited to the areas around the springs and the developed pond. Since the total area of all three is small, the best option is to exclude livestock from these areas. The areas will be monitored, and any riparian planting and alien species control that is needed will be done.

Connectivity

The planting of a shelterbelt starting at the patch of linear habitat north to the public road and then west to the grassland/forested area would provide enhanced connectivity.

Ducks Unlimited Canada has had projects around Chum Lake in the past, but their interest in this property would be limited.

If any conservation groups establish in this area in the future, the ranch owners would be willing to work with them.

Water use

The ranch owners are very interested in using irrigation water efficiently by monitoring soil moisture and increasing soil organic content.

Forested Areas/Forage Production/Weeds

Cross-fencing between forested and perennial forage areas will allow both areas to be managed better with regard to biodiversity. The forested area that is adjacent to the hay fields was selectively logged in the past and is slowly being infested with weeds that have spread due to soil disturbances during the construction of roads, landings, and skid trails. (see Specific Habitat Goals Images) Light, carefully timed grazing, along with seeding of the disturbed areas with grass seed will facilitate weed control, add agricultural value, and protect the regenerating forest.

The ranch owners are interested in using flushing bars on mowers and avoiding nighttime mowing to reduce wildlife mortality.

Species at Risk

Retaining and enhancing habitat for species at risk and regionally sensitive or threatened species is considered a goal for this ranch. A search of the Conservation Data Centre mapping site has shown that there are no recorded sightings of red- or blue-listed species on this operation, but habitat exists within the land base to support at least three of the species noted on the maps. (see field notes and images)

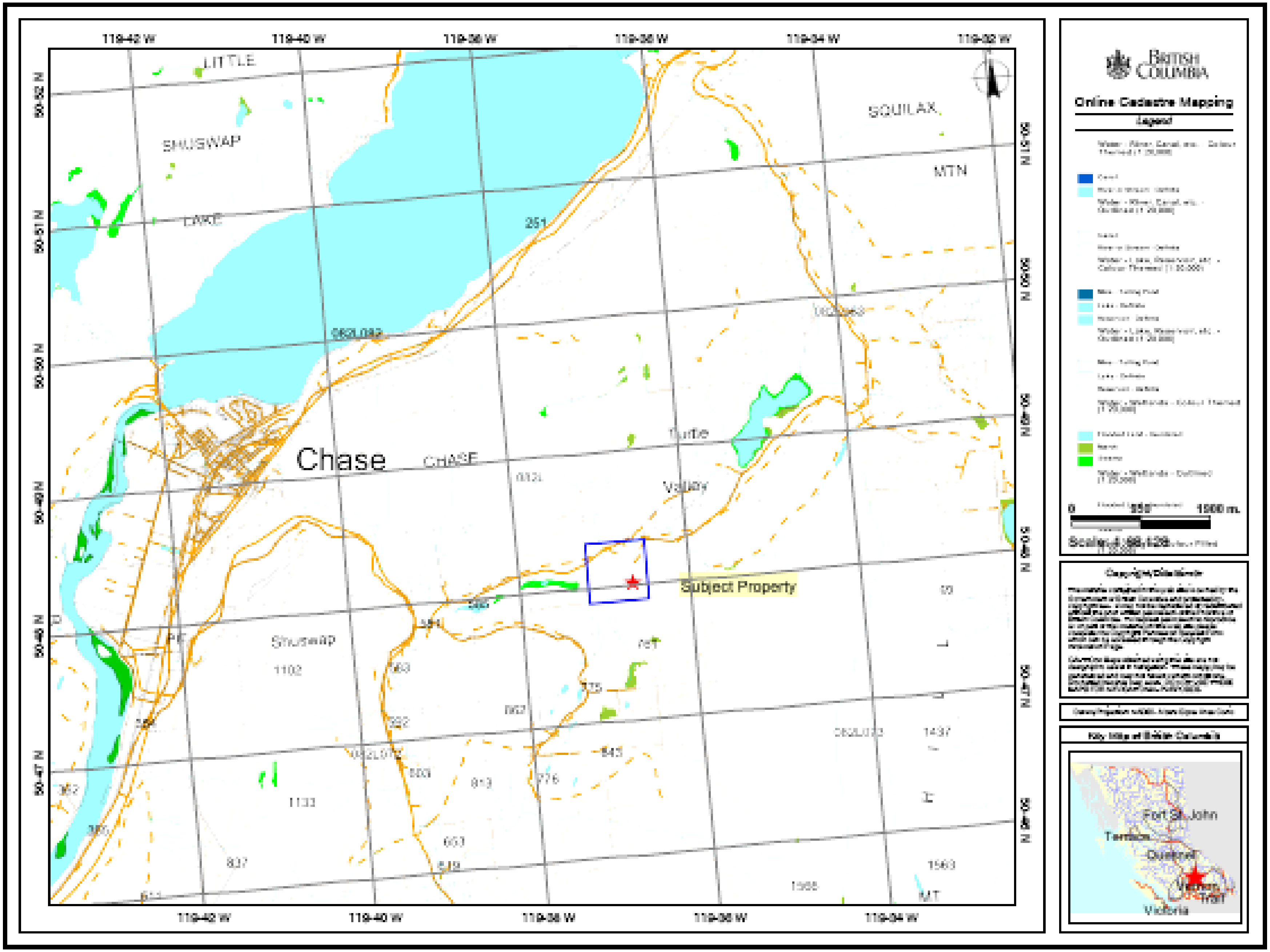
Specific Habitat Goals Images

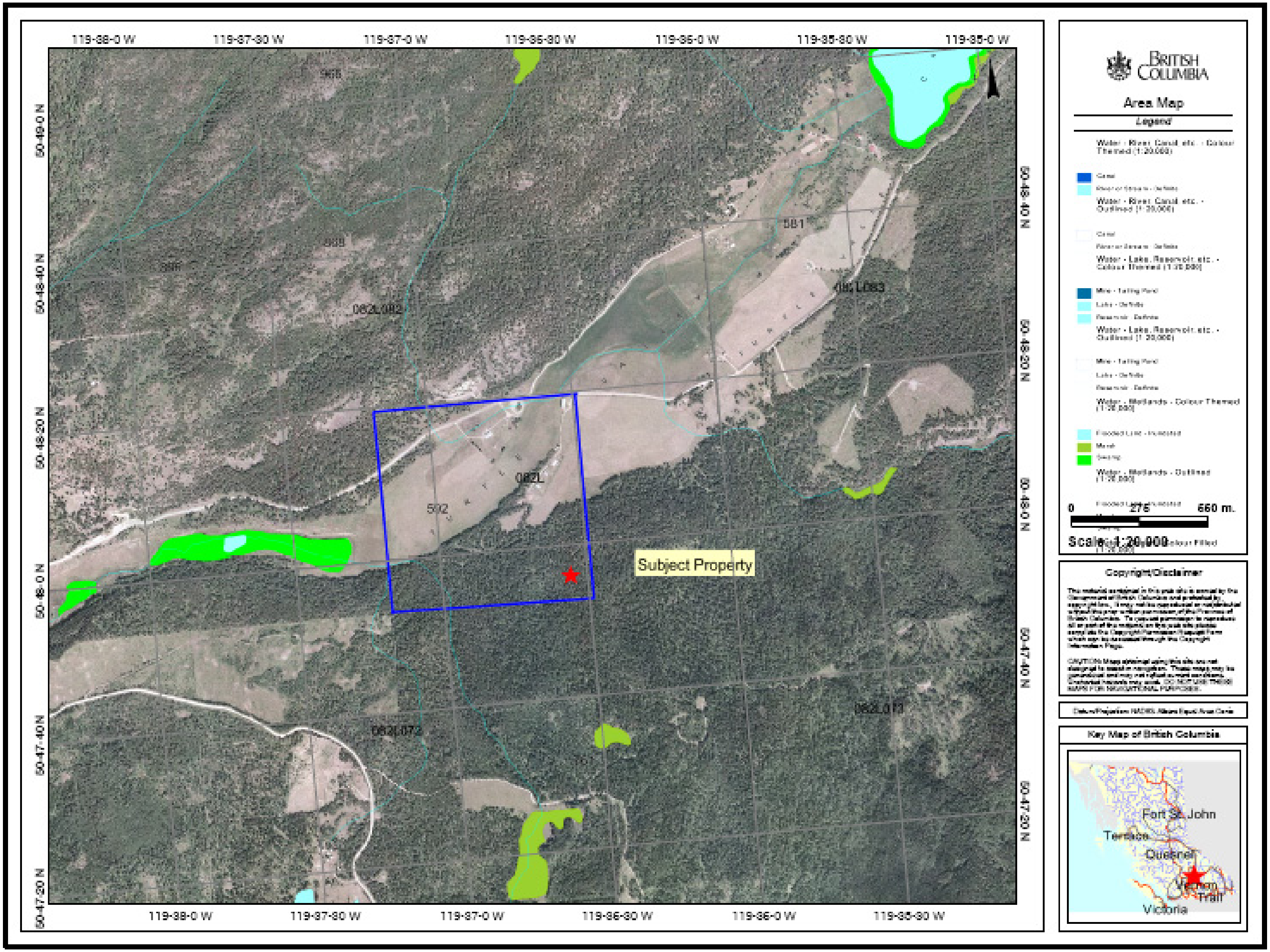
Multi-species/age logging aftermath with some forage and weeds

Available forage on roads and landings

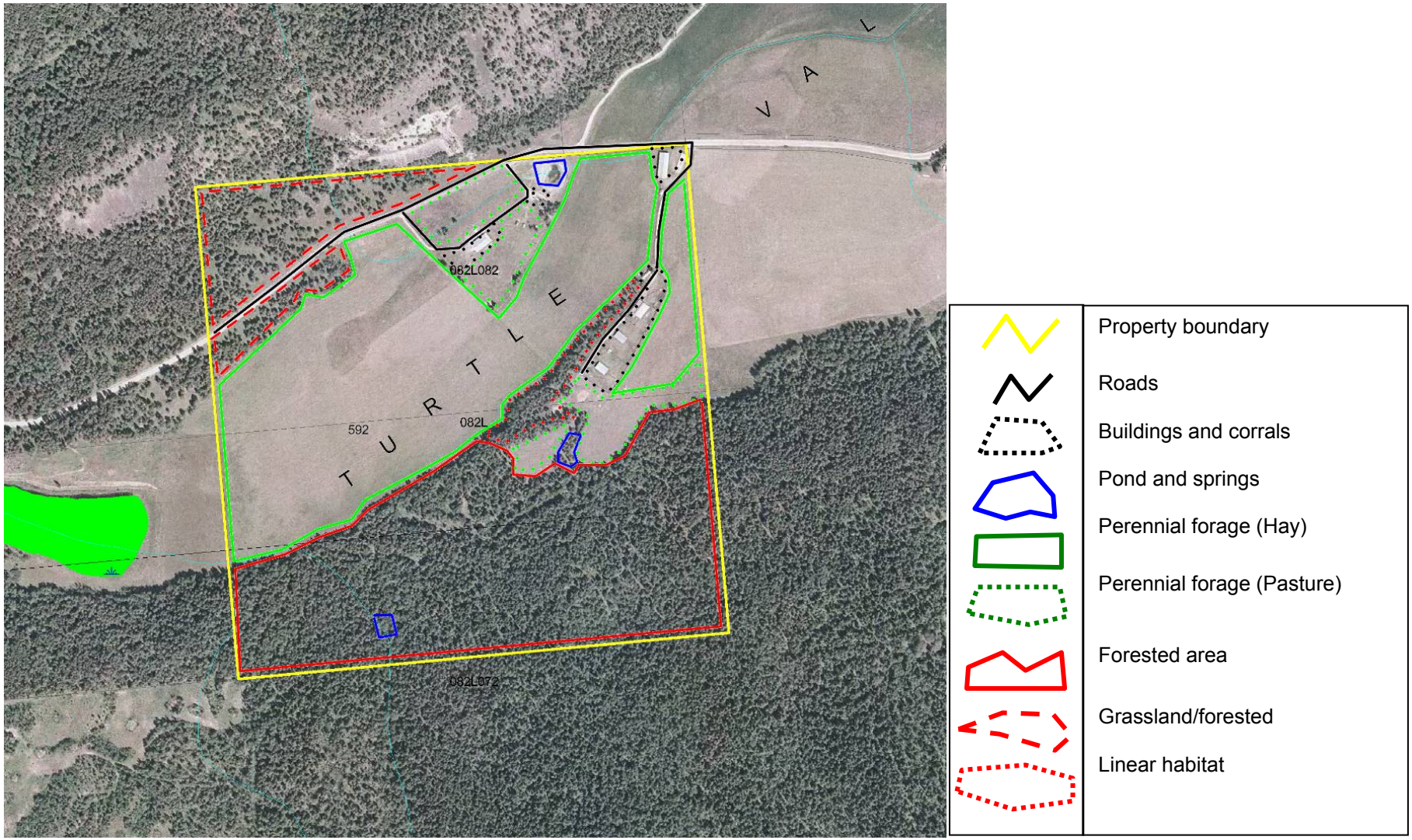
Mullen, burdock, and Canada thistle, road seeded

Landing with mustard and mullen

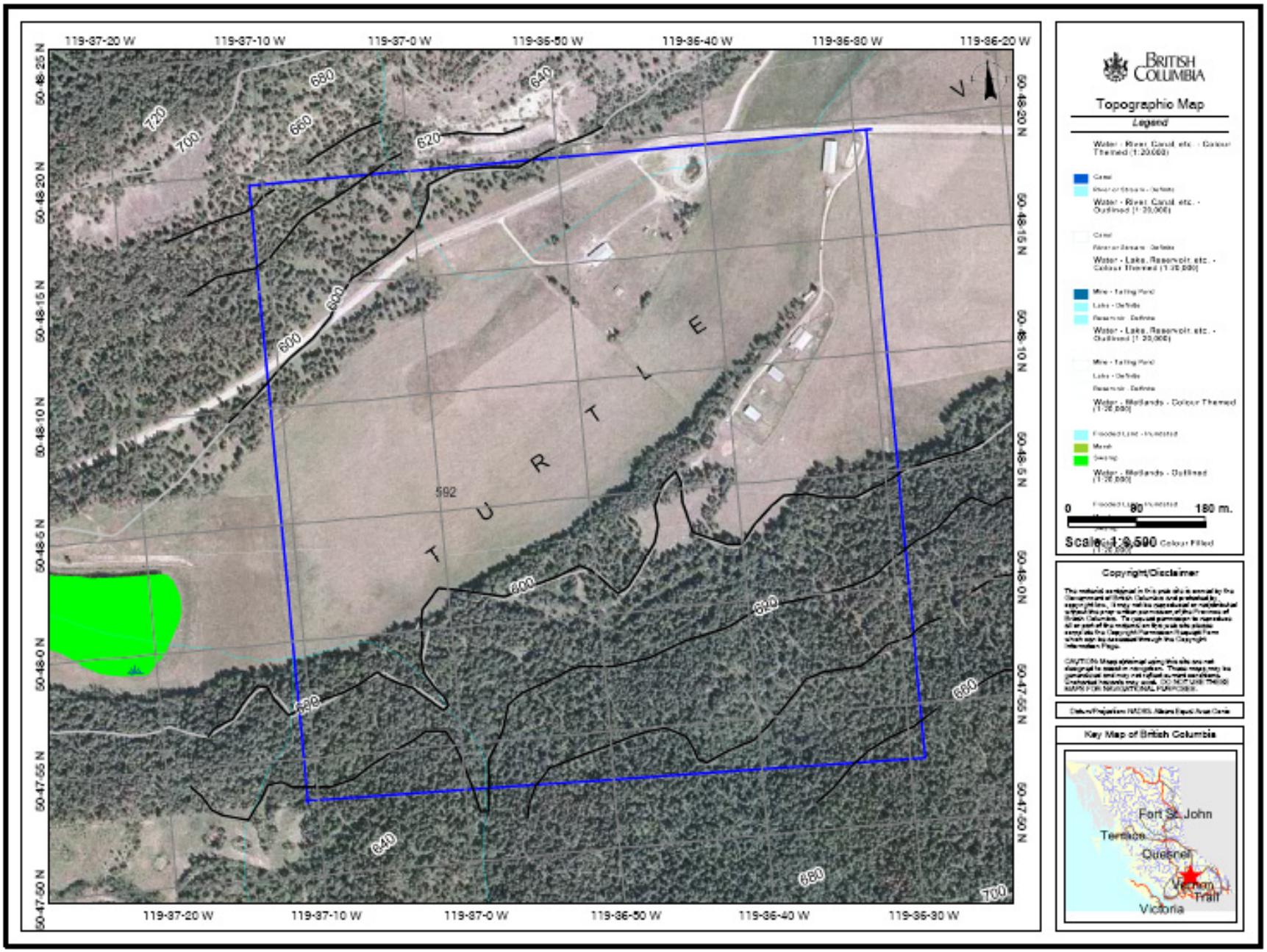

British Columbia
Online Cadastre Mapping
Legend
Chase
CHASE
LITTLE
SHUSWAP
LAKE
SQUILAX
MTN
Turtle
Valley
Subject Property
Shuswap
Fort St. John
Terrace
Quesnel
Victoria
Key Map of British Columbia


British Columbia
Area Map
Legend
Subject Property
Scale 1:20,000
Copyright/Disclaimer
Key Map of British Columbia
Fort St. John
Terrace
Quesnel
Trail
Victoria
119-38-0 W
119-37-30 W
119-37-0 W
119-36-30 W
119-36-0 W
119-35-30 W
119-35-0 W
50-49-0 N
50-48-40 N
50-48-20 N
50-48-0 N
50-47-40 N
50-47-20 N

Ranch Map



Ranch Location 119 36’ 42” W / 50 48’ 17” N, map orientated north, map scale 1- 8,000


119-37-20 W
119-37-10 W
119-37-0 W
119-36-50 W
119-36-40 W
119-36-30 W
119-36-20 W
50-48-25 N
50-48-20 N
50-48-15 N
50-48-10 N
50-48-5 N
50-48-0 N
50-47-55 N
50-47-50 N
680
640
720
700
660
620
600
592
T U R T L E
700
BRITISH COLUMBIA
Topographic Map
Legend
Water - River, Canal, etc. - Colour Themed (1:20,000)
Water - River, Canal, etc. - Outlined (1:20,000)
Water - Lake, Reservoir, etc. - Colour Themed (1:20,000)
Water - Lake, Reservoir, etc. - Outlined (1:20,000)
Water - Wetlands - Colour Themed (1:20,000)
Water - Wetlands - Outlined (1:20,000)
0
90
180 m.
Scale 1:9,590 Colour Filled
Copyright/Disclaimer
Key Map of British Columbia
Fort St. John
Terrace
Quesnel
Vernon
Trail
Victoria

Data Sheet

Breakdown of map areas

	Hectares	Percentage
Roads	1.5	2.4
Buildings and corrals	2.5	3.9
Pond and springs	.7	1.0
Perennial forage (Hay)	25.6	39.5
Perennial forage (Pasture)	2.5	3.9
Forested area	23.9	36.9
Grassland/forest	6.5	10.0
Linear habitat	1.5	2.4
Total	64.8	100.0

Species Richness

370 to 940 species (See map)

Eco-region

Southern Interior/Thompson Okanagan Plateau/Semi-arid Steppe Highland/Dry

Biogeoclimatic Zone

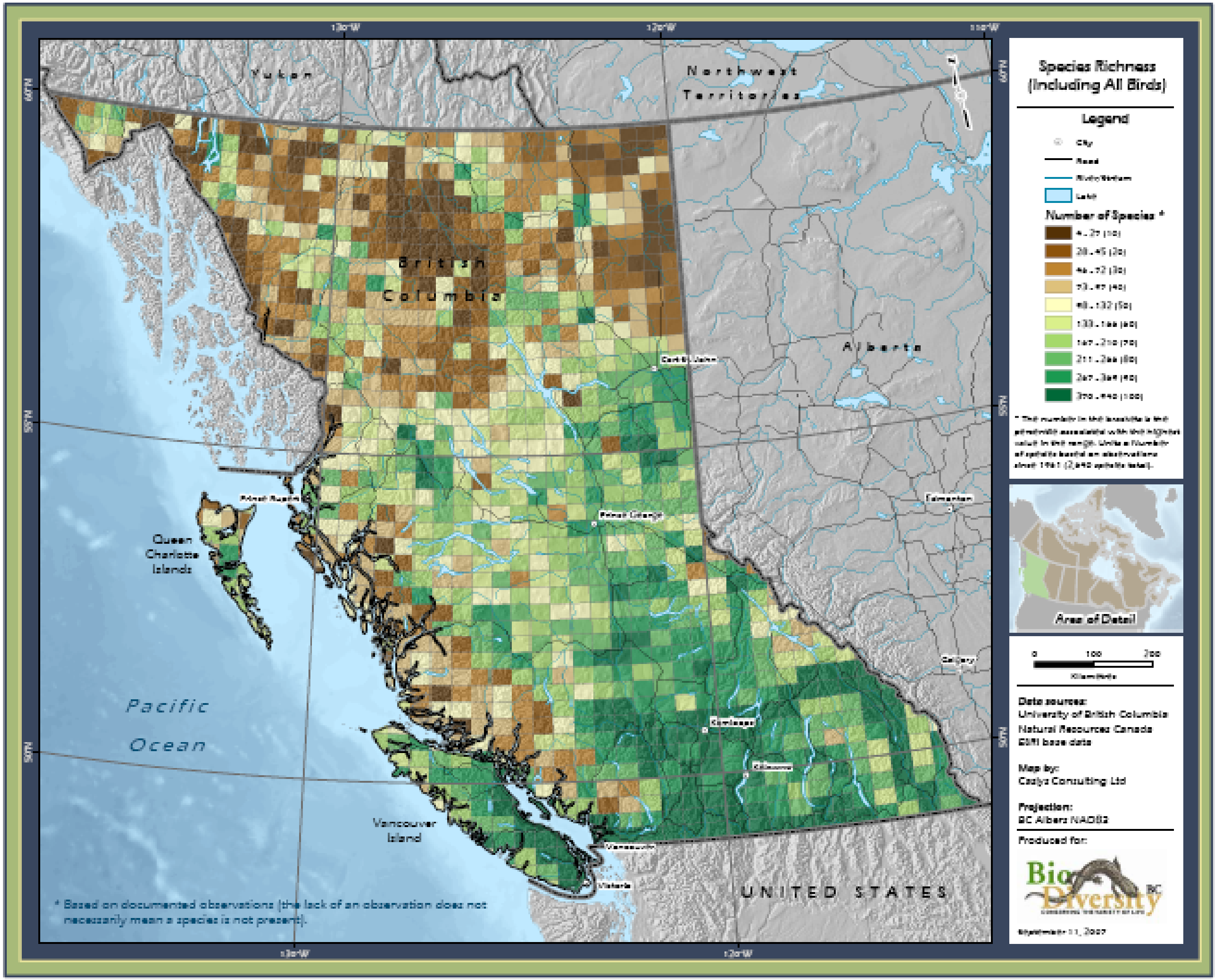
Interior Douglas-fir (see maps and zone data)

Subzone

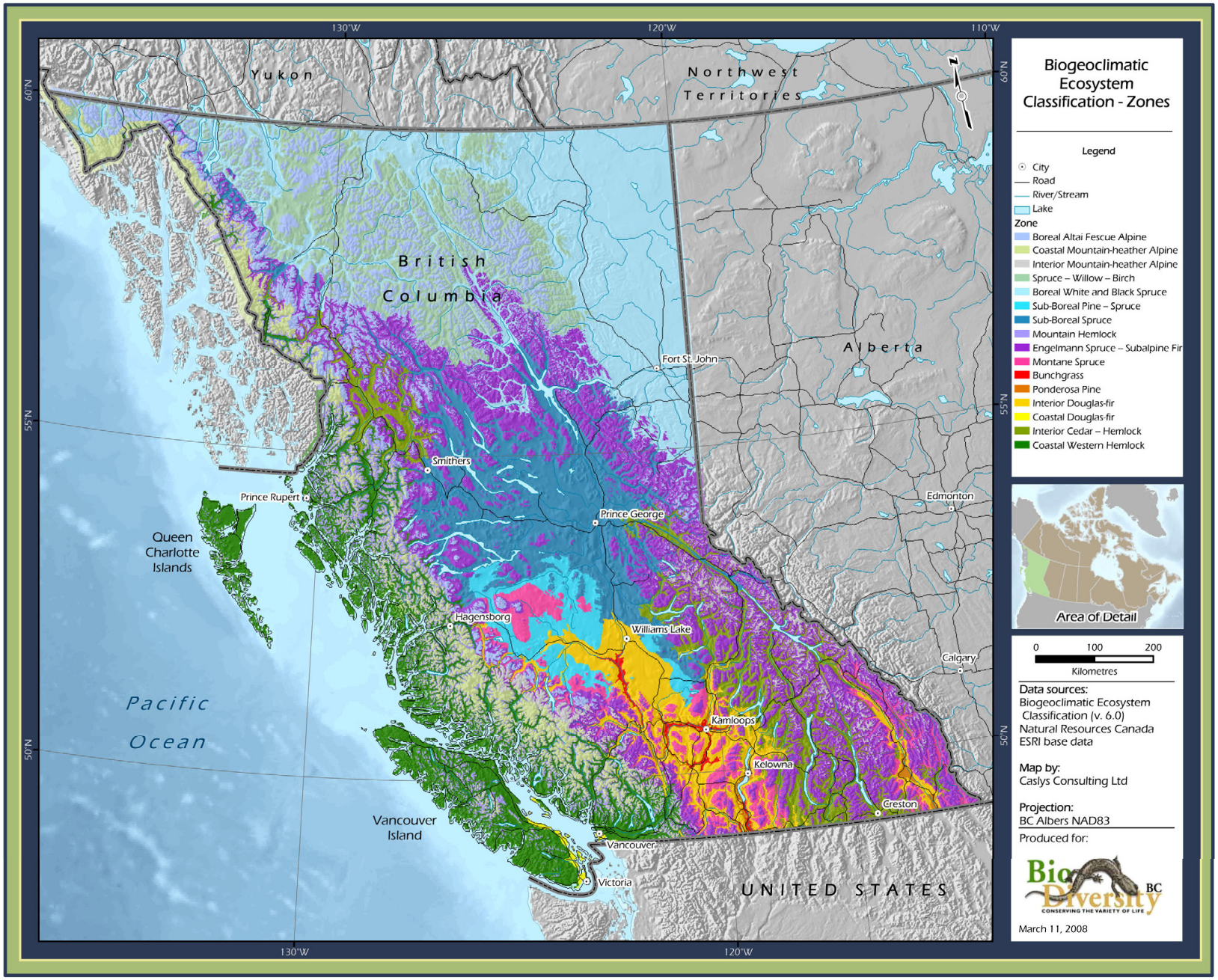
Very Dry Hot/Moist Warm

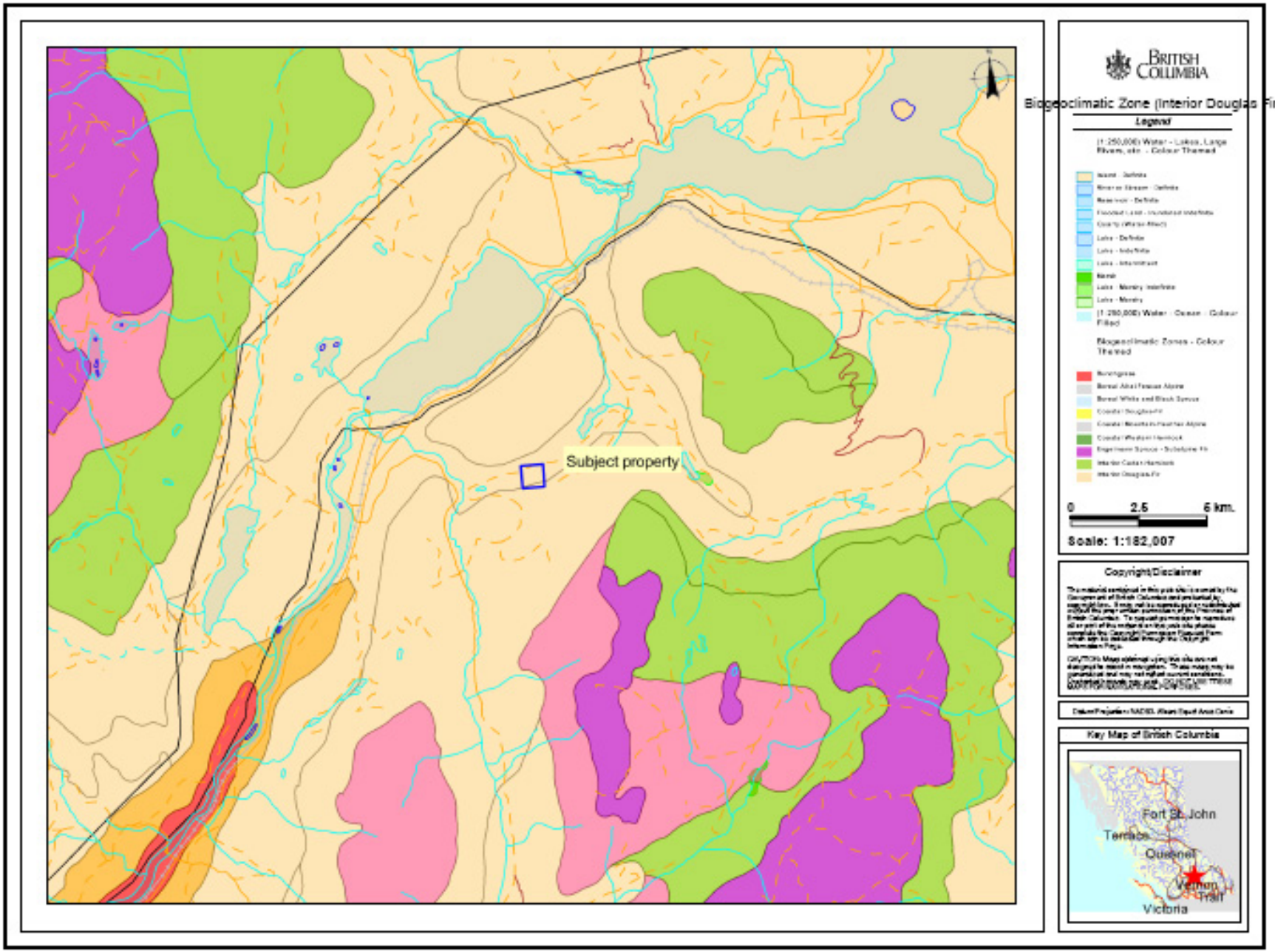
Variant

Thompson


Species Richness
(Including All Birds)
Legend
Number of Species *
Data sources:
University of British Columbia
Natural Resources Canada
ESRI base data
Map by:
Caslys Consulting Ltd
Projection:
BC Albers NAD83
Produced for:
Area of Detail
Yukon
Northwest Territories
British Columbia
Alberta
Queen Charlotte Islands
Pacific Ocean
Vancouver Island
UNITED STATES
* Based on documented observations (the lack of an observation does not necessarily mean a species is not present).

Some of the Species That Visit or Inhabit T bar K Ranch


Biogeoclimatic Ecosystem Classification - Zones
Legend
City
Road
River/Stream
Lake
Zone
Boreal Altai Fescue Alpine
Coastal Mountain-heather Alpine
Interior Mountain-heather Alpine
Spruce – Willow – Birch
Boreal White and Black Spruce
Sub-Boreal Pine – Spruce
Sub-Boreal Spruce
Mountain Hemlock
Engelmann Spruce – Subalpine Fir
Montane Spruce
Bunchgrass
Ponderosa Pine
Interior Douglas-fir
Coastal Douglas-fir
Interior Cedar – Hemlock
Coastal Western Hemlock
Area of Detail
0 100 200
Kilometres
Data sources:
Biogeoclimatic Ecosystem Classification (v. 6.0)
Natural Resources Canada
ESRI base data
Map by:
Caslys Consulting Ltd
Projection:
BC Albers NAD83
Produced for:
BC Biodiversity
CONSERVING THE VARIETY OF LIFE
March 11, 2008
Yukon
Northwest Territories
British Columbia
Alberta
Fort St. John
Smithers
Prince Rupert
Prince George
Edmonton
Queen Charlotte Islands
Hagensborg
Williams Lake
Calgary
Pacific Ocean
Kamloops
Kelowna
Creston
Vancouver Island
Vancouver
Victoria
UNITED STATES
130°W
120°W
110°W
60°N
55°N
50°N


Subject property
BRITISH COLUMBIA
Biogeoclimatic Zone (Interior Douglas Fir)
Legend
0
2.5
6 km.
Scale: 1:182,007
Copyright/Disclaimer
Key Map of British Columbia
Fort St. John
Terrace
Quesnel
Kamloops
Victoria

Biogeoclimatic Zone data

North Side of Valley

Coordinate Position

BC Albers: 1449543, 663467
Geographic: 50° 48' 11" N, 119° 36' 32" W
UTM 11N: 316182, 5631176

BEC Analysis - All - (RES) - Outlined

Feature Class SKey:	435
Zone:	IDF
Subzone:	xh
Variant:	2
Natural Disturbance:	NDT4
Map Label:	IDFxh2
BGC Label:	IDF xh 2
Zone Name:	Interior Douglas-fir
Subzone Name:	Very Dry Hot
Variant Name:	Thompson
Natural Disturbance Name:	Ecosystems with frequent stand-maintaining fires
Feature Area:	1441460608
Feature Length:	1346410
AREA:	0
LEN:	0

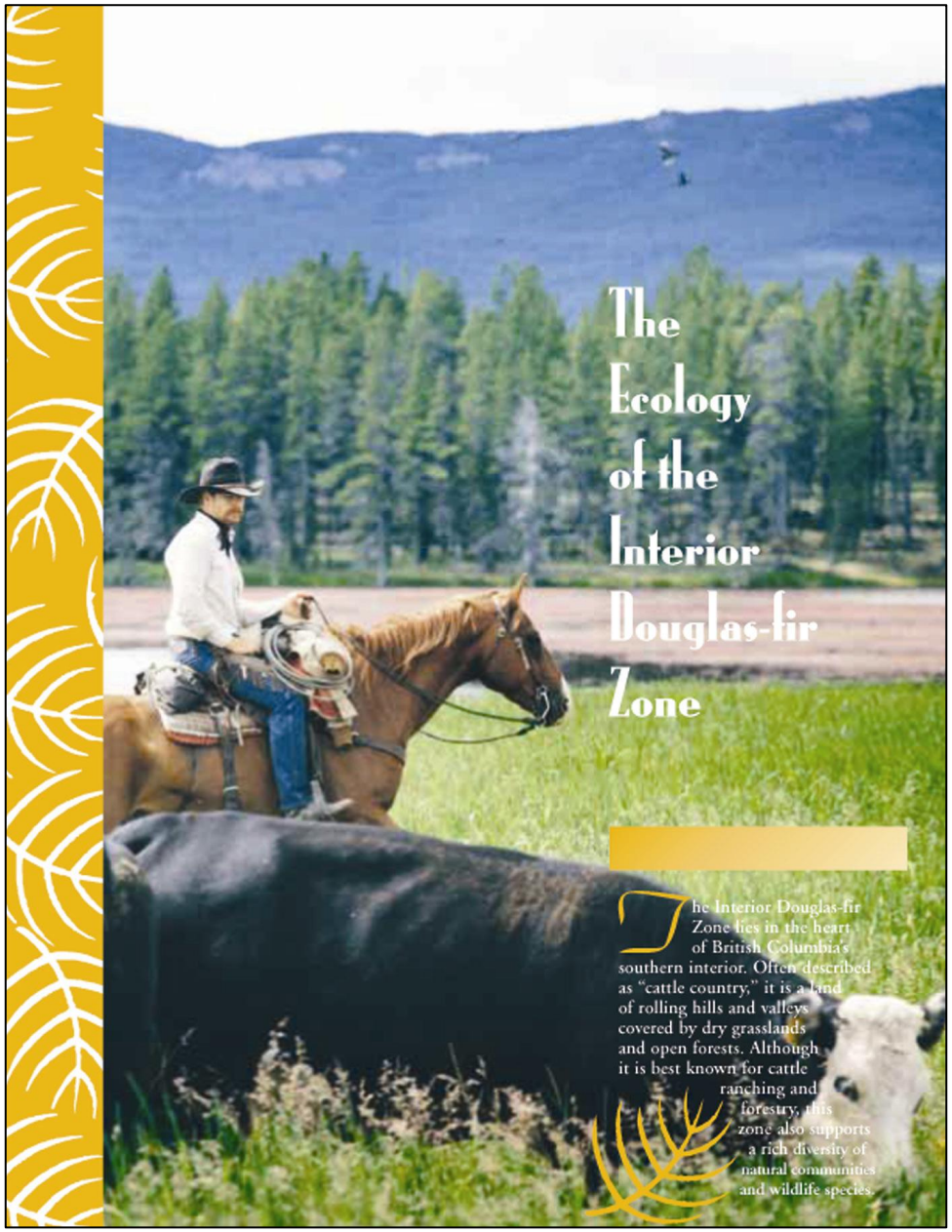
South Side of Valley

Coordinate Position

BC Albers: 1449684, 663005
Geographic: 50° 47' 56" N, 119° 36' 27" W
UTM 11N: 316265, 5630701

BEC Analysis - All - (RES) - Outlined

Feature Class SKey:	435
Zone:	IDF
Subzone:	mw
Variant:	2
Natural Disturbance:	NDT4
Map Label:	IDFmw2
BGC Label:	IDF mw 2
Zone Name:	Interior Douglas-fir
Subzone Name:	Moist Warm
Variant Name:	Thompson
Natural Disturbance Name:	Ecosystems with frequent stand-maintaining fires
Feature Area:	922797056
Feature Length:	587650
AREA:	0
LEN:	



Downloadable from:

www.for.gov.bc.ca/hfd/pubs/Docs/Bro/bro47.pdf

Species at Risk (non-sensitive) – Field Notes

Endangered Species and Ecosystems - Non-sensitive Occurrences - Conservation Data Centre

OCCR_AREA_SP_ID:	1067760
OBJECTID:	11307003
FEATURE_CODE:	FF84660210
SHAPE_ID:	3488
OCCR_ID:	5465
SCI_NAME_F:	*Olsynium douglasii* var. *inflatum*
SCI_NAME:	Olsynium douglasii var. inflatum
ENG_NAME_F:	satinflower
ENG_NAME:	Satinflower
EL_TYPE:	Vascular Plant
EL_TYPE_CD:	PLANT
TAX_CLASS:	monocots
DATA_SENS:	N
GLOB_RANK:	G4G5T3T4
PROV_RANK:	S1
BC_LIST:	Red
SURV_SITE:	LITTLE SHUSWAP LAKE
FIRST_OBS:	1972-05-04
LAST_OBS:	1972-05-04
OCCR_DATA:	Open, sandy hillsides.
VEG_ZONE:	Montane
HABITAT:	TERRESTRIAL; GRASSLAND/HERBACEOUS
REFERENCES:	Royal British Columbia Museum. 1991. B.C. Minist. Tourism, and the Minist. Responsible for Cult. 675 Belleville Street, Victoria, BC. V8V 1X4.
VERS_DATE:	Jan 6, 1992
AREA:	312474645.431436
LEN:	62747.5193089381

Coordinate Position

BC Albers: 1449141, 666821
Geographic: 50°50' N, 119°36' W
UTM 11N: 316203, 5634551

Identify Results

Endangered Species and Ecosystems - Non-sensitive Occurrences - Conservation Data Centre

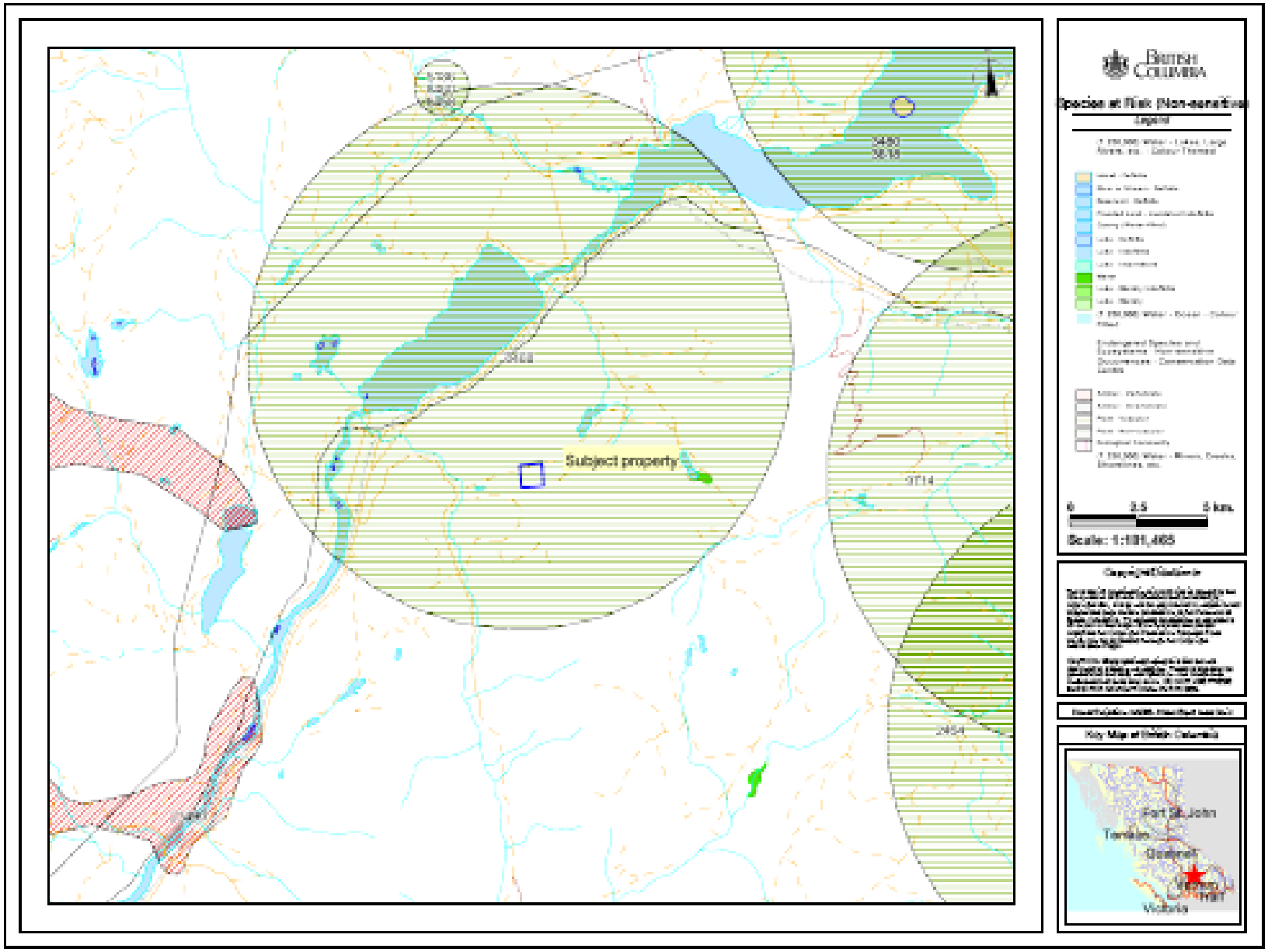
OCCR_AREA_SP_ID:	1069667
OBJECTID:	11308910
FEATURE_CODE:	FF84660110
SHAPE_ID:	23490
OCCR_ID:	6404
SCI_NAME_F:	*Taxidea taxus*
SCI_NAME:	Taxidea taxus
ENG_NAME_F:	Badger
ENG_NAME:	Badger
EL_TYPE:	Vertebrate Animal
EL_TYPE_CD:	ANIMAL
TAX_CLASS:	mammals
DATA_SENS:	N
GLOB_RANK:	G5
PROV_RANK:	S1
COSEWIC:	E (MAY 2000)
BC_LIST:	Red
SARA_SCHED:	1
SURV_SITE:	KAMLOOPS
DIRECTIONS:	There are directions and UTMs for each of the points used to make up each of the polygons within Hoodicoff (2002). Due to the very large number of points used to make up these polygons, these are not included here.
FIRST_OBS:	1928-05-28
LAST_OBS:	2001-08-22
OCCR_DATA:	There are 215 observations between May 22, 1928 and August 22, 2001 divided into 17 sources that include sightings of badgers and diggings. Observations within each source feature are a summary of the data presented in the complete database, which also includes UTM's and estimated precision (Hoodicoff 2002). The occurrence covers a very large area (~80km by 60km), however due to the density of sightings and activity within this area it was deemed appropriate. The source features are divided based upon concentrations and natural or anthropogenic features.
RANK:	E
RANK_DESC:	Verified extant (viability not assessed)
RANK_DATE:	2001-08-22
CONDITION:	There is a Provincial Park within the EO that contains two fenced, ecological reserves set aside for education and research; there are parcels of private land and cattle grazing in the park; ATV's and off-road vehicles are permitted outside of park boundaries (British Columbia Ministry of Water, Land and Air Protection (online) 2004).
HABITAT:	TERRESTRIAL; ROADSIDE; GRASSLAND/HERBACEOUS; CROPLAND
REFERENCES:	British Columbia Ministry of Water, Land and Air Protection. 2004. B.C. Parks and Recreation Lac du Bois Grasslands protected area. Online. Available: http://www.env.gov.bc.ca/bcparks/explore/parkpgs/lacduboi.html. Accessed October 7, 2004. Hoodicoff, C. 2002. Database (Access) of badger sightings historically until 2001.

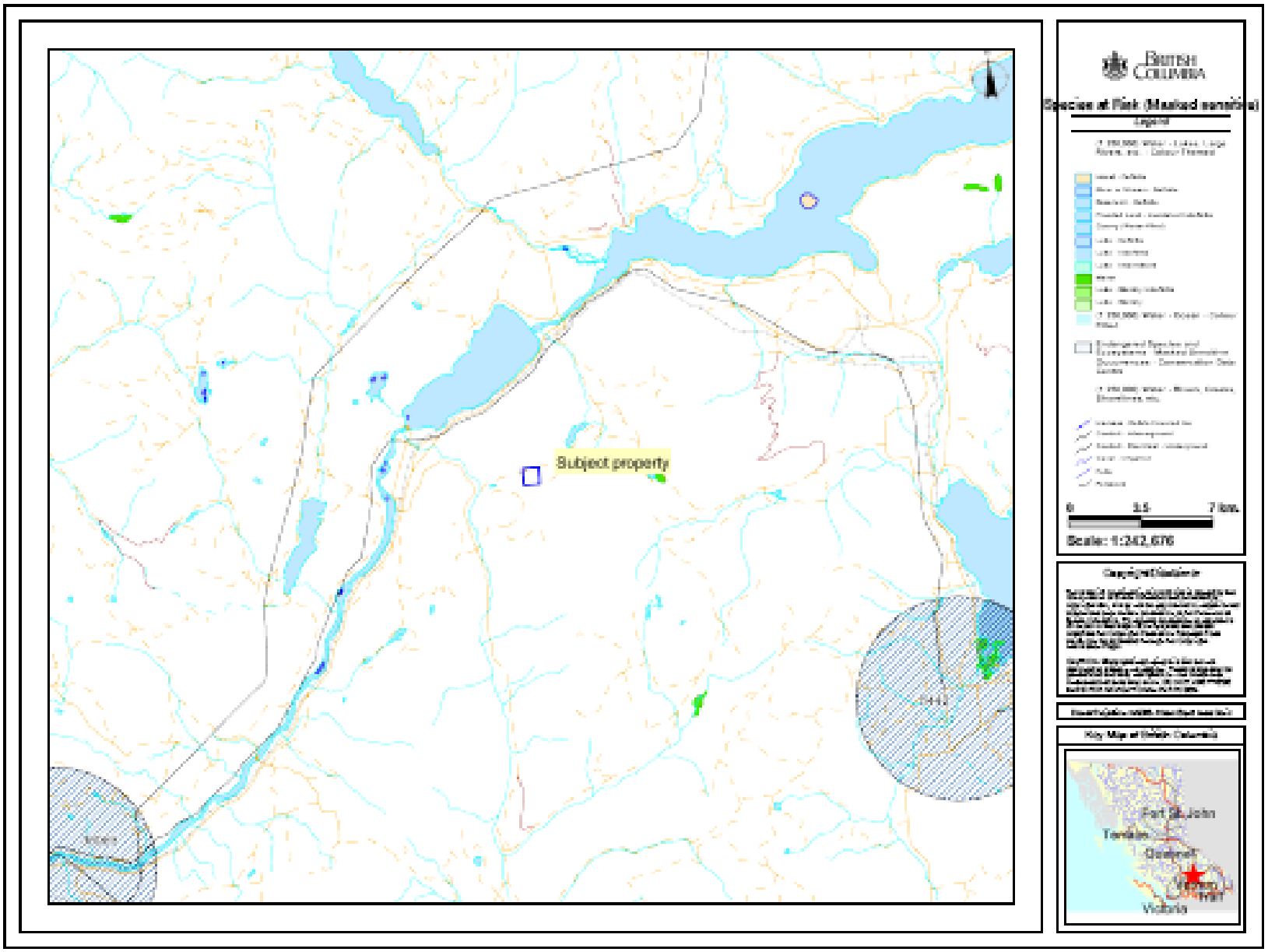
Rahme, A.H., A.S. Harestad, and F.L. Bunnell. 1995. Status of the Badger in British Columbia. B.C. Minist. Environ., Lands and Parks, Wildl. Branch. Working Rep. WR-72. 64pp.

VERS_DATE: Oct 5, 2004
EST_RA: Low
CON_EXTENT: N
AREA: 825714761.59224
LEN: 573325.538102788

Coordinate Position

BC Albers: 1438325, 654475
Geographic: 50°43' N, 119°46' W
UTM 11N: 303917, 5623666


Subject property
Fort St. John
Dawson Creek
Victoria
Scale: 1:681,465


Subject property
Species at Risk (Masked sensitive)
Legend
0
3.5
7 km.
Scale: 1:242,676
Key Map of British Columbia
Fort St. John
Terrace
Quesnel
Kelowna
Victoria

SARA (Masked Sensitive)

8442

SARA (Non-sensitive)

3448

23490

TABLE 3 ACTION PLAN WORKSHEET

List the assessment questions that you scored as Considerable Opportunity or Some Opportunity and which you want to take action on. Using the BMP list, select the BMPs that you want to implement on your land. Set goals that are specific to the BMPs and what you want to achieve in your operation. Determine what you will monitor and when to check if your goals are being met. See the Sample Biodiversity Management Plan section of the guide for an example.

FARM NAME/AREA:	DEVELOPED BY:	DATE DEVELOPED:	PAGE 1 OF 1
T bar K Ranch	Karen Wilson, Ted Sikora, Pete Spencer	March 1, 2010	

Question to Be Acted Upon	Proposed BMP or BMP Practice Code	Specific Goal(s) Related to BMP(s)	Proposed Monitoring		Date Completed, Approvals or Permits Required, and Other Comments
			When	What	
#1, #3	**1.1, 1.2, 1.3**	Exclude livestock, provide alternate livestock watering, and restore native plants	During growing season	Evaluate vegetation	
#2, #6, #9	**2.2, 6.2, 6.3, 9.1, 9.3**	Plant shelterbelt/hedgerow in field margins	During growing season	Survival	
#5, #10	**5.3, 10.2**	Separate forest and pasture land to manage browsing/grazing, and alien species	During growing season	Evaluate vegetation	
#14	**14.23**	Minimize water use, monitor soil moisture, increase soil organic content	During growing season	Soil moisture	