Tranquille Special Features Zone

Management Direction Statement

Plan Overview: *This document is intended to provide operational level, short and medium term guidance, to the Manager of Lac du Bois Grasslands Protected Area. It is subject to BC Parks Conservation Management Polices and to the Lac du Bois Grasslands Park Management Plan, which provides long-term goals and objectives, for the whole Park.*
Management direction is provided through specific management goals, methodology is not provided nor is detailed inventory or values (available in separate documents). It is expected that the Park Manager will work toward achieving the goals by undertaking continuing studies to improve knowledge and by applying adaptive management principles. The Park Manager is counseled to undertake management actions cautiously and to respond appropriately if negative results are observed.
Appendices to this document provide summaries of conservation values, a history of past management practices, and the role of the area in the local and region ecosystems.

The Tranquille Wildlife Management Area (TWMA), was established under the Wildlife Act in 1987 including approximately 253 hectares. In 1996 it became part of Lac du Bois Grasslands Park. The park boundary includes a hay meadow (Lot 341) adjacent to the former TWMA. The Wildlife Branch had planned to include the lot within the TWMA. The designation was never completed. This management plan applies to both of these areas, which will be referred to in this plan as the Tranquille Special Features Zone (SFZ).

This document was originally compiled by Bob Scheer, Ecosystem Officer, and is based upon reports produced by Ralph Ritcey (2000) and Ed Hennan (2001) and upon management recommendations from Ducks Unlimited Canada and Doug Jury, ministry Wildlife Biologist. Ritcey provided management recommendations, and compiled a detailed record of bird species occurrences as well as a management history of the area. Hennan produced the vegetation mapping contained in this document as well providing as a number of management recommendations.

Role

The role of the Tranquille SFZ is to:
Protect and enhance the productivity and diversity of native habitats and species with an emphasis on the maintenance and enhancement of "identified species of concern".
To maintain and present public wildlife viewing opportunities.
Provide feeding and resting areas for a wide range of migratory bird species.
Protect and enhance important wetland and riparian habitats for resident, transient and occasional bird species.
Protect natural salmonid rearing habitats.
Protect and enhance wetland reptile amphibian habitats.
Encourage productivity of prey species.
Protect a significant wetland habitat in the Thompson River drainage.

Vision

The Tranquille Special Features Zone will play an increasingly important role as a refuge for resident, transient and migratory avian species, as wetland habitats become increasingly rare in Southern British Columbia. Wildlife viewing will be encouraged and viewing opportunities provided which are sympathetic to conservation values. Protection of plant and animal species and will be accomplished by maintenance of essential habitats and minimizing degrading disturbances. Cattle grazing and/or haying may continue to be employed as a management tool to benefit diversity and productivity when and where appropriate.

In the medium term management activities will increase the diversity of habitats within the zone. Critical habitats such as cottonwood forest and willow complexes will begin to re-establish within the natural capacity of the area. Research will be underway to monitor and guide the impact of management activity

In the long term, the role of the Special Features Zone may become critical in providing essential resting and feeding areas for migrating birds. A detailed management plan will be in place, based upon studies, which provide a good understanding of the cause and effect of specific management activities. Old growth cottonwood stands will be well established and expanding, providing new habitat for canopy and cavity nesting birds. Feeding and resting areas will be maintained and potentially enhanced to accommodate the SFZs' increased importance. Rare, endangered and threatened plant species occurring within the area will be secure; the variety of native species that currently utilize the area will be greater; and some habitat enhancement may have been employed to compensate for loss of values in other locations and the loss of shallow ponds due to silting from annual flooding.

Goals and Management Strategies

Goal 1 - Protect and Increase the Productivity of the SFZ

Objectives	*Strategies*
Assure commercial activity within the SFZ is both beneficial and compatible with the Park Act, the Park Management Plan and the long term "Vision"	Phase out cattle use except in the main hayed area. Work with the current grazer and other stakeholders to minimize the impact of winter cattle use in the SFZ by fencing and watering sites to protect priority habitat (Park Use Permit issued in 2003). Over time, reduce cattle use to a level which is compatible with optimum habitat protection. When existing Park Use Permit expires, review impacts of haying and grazing to determine best future management options.
Study and monitor the effects of the removal of grazing and haying on plant communities and habitat values in areas formerly used for grazing and haying. *A Park Use Permit issued in 2003 restricts grazing (winter only) and haying to the central portion of the main hay field. A watering site has been installed in the northeast part of the cattle use area.*	General monitoring of areas newly restricted from cattle use by fencing. Establish temporary and permanent vegetation monitoring plots to compare vegetation inside and outside the fenced area. Study the change in habitat values for wildlife species that could be affected (negatively or positively) by the restrictions on grazing and haying. If appropriate, based on knowledge gained through monitoring, consider changes to the location or size of the cattle use or hay cutting area.
Manage toward a healthy native plant community while recognizing the presence and value of beneficial non-native species already present in the area	Identify and manage to retain non-native species that provide value to the Area. Work co-operatively with adjacent land mangers to maintain and improve non park lands with important habitat elements Where significant benefits are determined, protect and potentially, enhance specific non-native plant species.

Goal 2 Increase the Diversity of Habitats Which Benefit Wildlife

Objectives	Strategies
Encourage wildlife viewing opportunities that have minimal disturbance on sensitive habitats and wildlife.	Provide information and low impact viewing developments to facilitate viewing opportunities through co-operative initiatives with local organizations and stakeholders. Monitor viewing activities and adjust management as necessary. Maintain no hunting/no shooting regulation. Develop habitat wildlife use inventory through a program enlisting voluntary observers.
Maintain habitats mapped as "Cottonwood" and "Mixed tree shrub riparian" along the northern boundary of the SFZ with emphasis on providing "song bird" habitat.	Install/maintain fences to protect sensitive habitats from cattle if seasonal use continues. Manage the area co-operatively with the permittee and adjacent land owners. Monitor for and manage noxious weeds as necessary. If natural recruitment of cottonwood is unsuccessful, planting of cultured stock may be undertaken.
Provide habitat enhancement for cavity nesting birds.	Maintain Wood Duck nesting box program. Investigate the feasibility of expanding the provision of nesting structures for other species.
Allow existing and potential shrub and cottonwood communities to recover from past agricultural activities.	Move haying boundaries away from potential shrub and cottonwood communities. Prevent cattle from disturbing potential communities by erecting permanent or temporary barriers as required. Protect existing cottonwood stems from beaver damage. Maintain existing boundary fencing. Monitor and adjust management as necessary.
Maintain short grass areas for species such as Canada Goose	Continue haying in a reduced area of the hay meadow, subject to assessment of impacts on other species and habitat. Potentially utilize limited seasonal use by cattle and adjust duration and numbers as required to protect developing shrub communities.

Minimize human disturbance to wildlife and sensitive habitats	Maintain limits to vehicle access Allow trail development only along periphery of the area Work with the developer of the Tranquille Farm property to develop recreational guidelines for guests.
Protect and improve important adjacent habitats	Meet regularly with adjacent landowners/managers to discuss issues and formulate sympathetic management strategies.
Maintain Tranquille Pond as a feeding and refuge area for waterfowl and shorebirds	Undertake management actions, if necessary, to maintain open shallow water on the pond during migration periods. Investigate strategies to reverse the long-term effects of silting-in of the pond. Implement enhancements as required.

Goal 3 - Assure maintenance of rare, threatened and endangered species, which have reproductive potential in the area.

Objectives	Strategies
Maintain **Dotted Smartweed** (blue-listed) *(Polygonum punctatum)* populations around culvert and Tranquille Ponds	Re-monitor vegetation plots to determine long term trends on a 5 year interval.
Protect populations of **Tall Beggartick** (red-listed) *(Bidens vulgata)* located along the dry margins of the SFZ	Determine optimal site conditions. Manipulate small selected sites, as necessary, to encourage natural growth and establish a stable population.
Encourage the re-establishment of **Bobolink**	Initiate a project to identify limiting factors and develop a management plan in co-operation with the permittee and adjacent landowners.
Assure maintenance of **Painted Turtle** and **Great Basin Spadefoot Toad** populations	Identify priority habitats such as wintering ponds and nest sites (turtle). Assure protection of priority sites from trampling by cattle. Establish baseline population levels and monitor.
Provide winter habitat for **Sharp-tailed Grouse**	Identify priority winter habitat locations. Encourage the establishment of water birch. Manage to eliminate disturbance by wintering cattle.
Encourage the establishment of **Great Blue Heron** nesting colony (long term) and provide habitat for **Lewis's Woodpecker**	Establish and protect old growth cottonwood stands. Assure potential nesting sites are not disturbed.

APPENDIX A – SFZ BACKGROUND

Local and Regional Context

The Tranquille Special Features Zone is situated where the Thompson River discharges into Kamloops Lake. Situated on the north side of the river, at the edge of the city of Kamloops, it embraces some 253 hectares. The area is clothed in a mixture of flood tolerant shrubs, trees, sedges and grasses. Tranquille Pond, a semi-permanent wetland of about 7 hectares, is a prominent feature of the area. The pond attracts a wide variety and number of migrating waterfowl and shorebirds. The greater area provides habitat for both resident and transient wildlife. Listed as a birding hotspot, sightings of unusual, rare, transient and accidental species are frequent.

Past Management

Much of the area has been used as a haying and wintering area for cattle at least since the early part of the 1900's. Lot 341 was cleared of willows and cottonwood before being used to grow hay for winter feeding. Adjacent willow flats provided native vegetation on which cattle foraged to supplement hay fodder. Recently, haying has been extended westward from traditional boundaries

From 1954 to 1968, 200 head of Herefords wintered annually on the area from November to calving time in February. In severe weather, cattle sought shelter in the extensive willow stands present at that time on what later became the WMA. Cows were then transferred to calving barns at the farm. Stands of non-native reed canary grass had been planted and had become established along the creek flowing from what is now Cinnamon Ridge prior to 1954. Those stands were expanded by plantings during the period of the 1950's and 1960's. (summary of phone conversation with Les King former manager Tranquille Farms)

Andy Caldow, farm manager from 1968 to 1983 recalls the situation on the hay meadow and willow flats during that period: each year, about 150 cows and 75 yearlings arrived in November and foraged on the hayfield and adjoining flats without feeding until the arrival of snow and cold weather. They were usually fed hay from lot #341 until mid February when the cows were removed for calving. Yearlings remained on the meadow until late April or May.

Dr. Al Van Ryswyk soils scientist, now retired from Canada Department of Agriculture, recalls working on a project to enlarge the stands of reed canary grass at Tranquille after the initial work by Tranquille farm. The project found that the grass had invaded and had become established on all suitable growing sites on and adjacent to Lot 341. Length of time under floodwater was the factor preventing further spread.

In the spring of 1980, a prescribed burn to improve forage swept through the willow flats killing many of the mature willows and increasing the area clothed in reed canary grass. Prior to the fire, root-boring beetles had infested the willows leaving many were dead or dying.

A few years after the fire, Tranquille institution closed and the provincial farm ceased to operate. Use of the hayfield was then licensed to Frolek Cattle Company. Under that licence, numbers of wintering cattle were increased over the previous use by Tranquille farm. 300 head were permitted on the area from fall to the end of March in each year. Calving takes place on the hayfield and adjacent WMA beginning in February with cows and calves remaining there until opening of spring ranges in April.

Increased numbers of wintering cattle resulted in heavy browsing of woody riparian vegetation on the periphery of Lot 341. In 1987, the Habitat Conservation Fund funded a project to fence the riparian zone between the meadow and the highway to prevent further damage to the zone. The fence has succeeded in excluding cattle from the most important parts of the riparian zone. However, cattle browsing is still heavy enough to prevent an early re-establishment of willow and red osier dogwood stands to their pre 1980 levels. Cattle concentrated around culvert pond and the outlet creek in winters of the early '90's leaving unsightly manure highly visible to people visiting Tranquille in late winter and spring.

In the early 1990's the Ministry of Environment carried out several projects to enhance viewing opportunities in the WMA:
A parking lot with two picnic tables installed near Tranquille Pond. The parking lot has received year round use but the picnic tables have been destroyed by vandals.
A brochure entitled Wildlife Viewing at Tranquille published and made available to the public.
Loafing logs to attract waterfowl, shorebirds and waders during high water in early summer installed west of the parking lot. Many bird species, muskrat and turtle have been seen using the logs.
A viewing trail on the hillside north of the TWMA overlooking Tranquille Pond. The latter two projects were completed by volunteers from Kamloops and District Fish and Game Club. The trail has seen limited use, partly because access is impaired by a closed gate and there is poor parking for street vehicles.

Tranquille, or parts of it, has been closed to hunting since its establishment as a Game Reserve in 1926. Various closures to hunting have been in effect since that time and the area is presently designated as a no shooting, no hunting area.

Area Attributes

Relationship to the Thompson River and Kamloops Lake
The delta of the Thompson River is highly dynamic ecosystem containing vegetation in early to mid seral stages. Portions of the delta contain mud and gravel flats. Adjacent to the main river channel, the bank is actively eroding resulting in steep banks standing up to 4 meters above low water levels. River water levels fluctuate up to 5 meters in some years. Over time, the rivers main channel may cut deeply into the SFZ completely changing the area.

The area experiences a yearly cycle of flooding and drying beginning in late May when waters of the rising Thompson River begin to invade flood channels. In late June the flood usually crests and nearly all of the management area may be up to 3 metres underwater. This makes the area, at least for a period, an eastward extension of Kamloops Lake. During these high water periods, river silts are deposited throughout the area and the delta continues to extend farther westward into Kamloops Lake. During this period driftwood may also move into and about the area

depending on flood and wind conditions. Fish from both the lake and the river (carp and salmonids) are known be present during high water.

The timing of river subsidence is dependent on summer rainfall and the melting rate of the high elevation snow pack in Thompson Rivers' headwaters. Often much of the area remains underwater until mid July. Sand and mud flats do not usually emerge until August. The river level continues to drop through winter so much of the area is dry from mid to late summer through winter into late May.

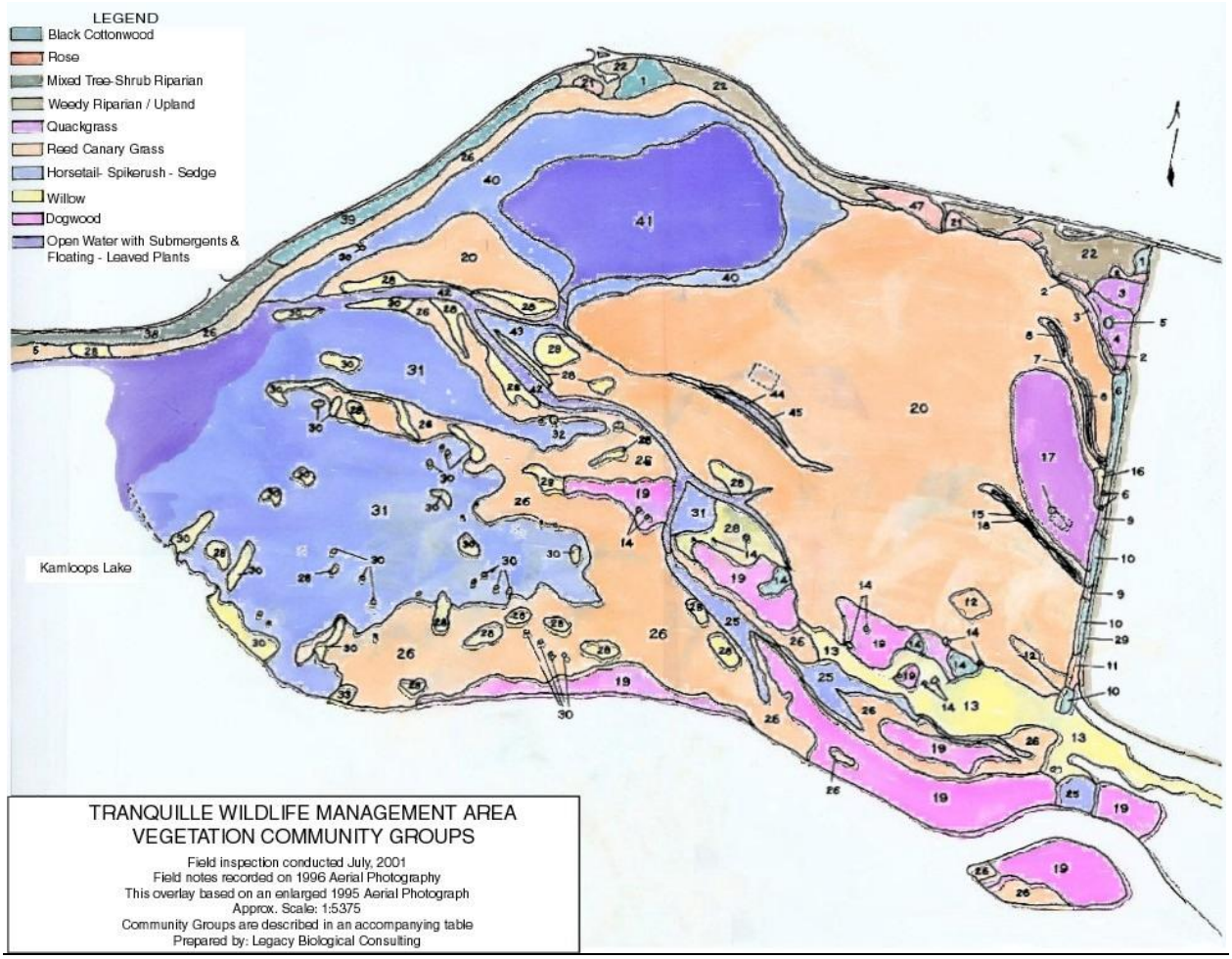
Relationship to other lands

On the east side lies the Cinnamon Ridge composting facility operated by the City of Kamloops. On the west side the area is bordered by Tranquille farm. Immediately north of the area the heavily travelled Tranquille Road and CN Railroad restrict interchange of terrestrial wildlife between the SFZ and upland portions of Lac du Bois Grasslands Provincial Park. There is limited habitat connectivity via riparian edges to adjacent agricultural lands.

On the south side of the river opposite the SFZ the City of Kamloops maintains a sewage treatment facility. This area is known to provide habitats particularly for waterfowl. This area is not accessible to the public and the interrelationship of wildlife between the 2 areas is not well understood. However, the combined areas provide both a diversity and quantity of habitats that collectively maintain critical wildlife values within the North and South Thompson River valleys.

Vegetation Map (2001)

(numbers refer to detailed descriptions of each polygon – not included in this document)



TRANQUILLE PLANT SPECIES LIST: Collected Plants

REF. NO.	COMMON NAME	*LATIN NAME*	COMMENTS
1	Quackgrass	*Agropyron repens*	
2	Curled Dock	*Rumex crispus*	
3	Pasture Sage	*Artemesia frigida*	
4	Lamb's Quarters	*Chenopodium album(?)*	
5	Kochia	*Kochia scaparia*(?)	
6	Quackgrass	*Agropyron repens*	Repeat
7	Nootka rose	*Rosa nutkana*	
8			
9	Cinquefoil	*Potentilla norvegica(?)*	
10	Redtop Grass	*Agrostis sp.*	
11	Sedge	*Carex aquatilis(?)*	or *rostrata?*
12	Marsh Yellow-Cress	*Rorippa palustris*	
13	Water Smartweed	*Polygonum amphibium*	
14	? Smartweed	*Polygonum hydropiperoides(?)*	Small, white flowers, limp
15	Spotted Knapweed	*Centaurea maculosa*	
16	Redtop	*Agrostis gigantea (alba?)*	
17	Horsetail	*Equisetum fluviatale*	
18	Quackgrass	*Agropyron repens*	Repeat
19	Daisy (Fleabane)	*Erigeron sp.*	

20	Fringed Loosestrife	*Lysimachia ciliata*	
21	Quackgrass	*Agropyron repens*	Repeat; but leaves not scabrous
22	Loesel's Tumble-Mustard	*Sisymbrium loeselii*	
23	?		
24	Portulaca (Purslane)	*Portulaca oleracea*	
25	Sandbar Willow	*Salix exigua*	
26	Fringed Loosestrife	*Lysimachia ciliata*	Repeat; see #20.
27	Willow (Bebb's?)	*Salix bebbiana(?)*	
28	Not Used?		
29	Brome grass	*Bromus Inermis(?)*	
30	Agrostis	*Agrostis sp.*	
31	Arrowhead	*Sagitarria cuneata*	
32	Variable Pondweed	*Potamogeton gramineus*	
33	Water Plantain	*Alisma plantago-aquatica*	
34	Dogbane	*Apocynum cannabium(?)*	Apparently spreading vigorously into meadow at SE corner of meadow
35	Milkweed	*Asclepias speciosa*	On dyke
36	? grass	*Agropyron sp.*	On dyke
37	Cinquefoil	*Potentilla norvegica*	Repeat; 2 species? or different growth conditions?
38	Yellow Evening-Primrose	*Oenothera villosa*	Uncommon
39A	? grass	*Agropyron ?*	No apparent ligules
39B	? grass		
40	Waterwort	*Elatine triandra*	Shallow water in meadow
41	Variable Pondweed	*Potamogeton gramineus*	Repeat; see #32
42	Smartweed	*Polygonum sp.*	
43	American Vetch	*Vicia americana*	
44	Willow	*Salix sp.*	
45	Horsetail (Scouring Rush)	*Equisetum hyemale*	
46	Sedge (Beaked?)	*Carex rostrata(?)*	
47	Field Mint	*Mentha arvensis*	
48	False Dragonhead	*Physostegia parviflora*	
49	Reed Canary grass	*Phalaris arundinacea*	In and around wet depressions; appears to have different general appearance depending on location in hydrological profile.
50	Peachleaf(?) Willow	*Salix amygdaloides(?)*	
51	Agrostis	*Agrostis sp.*	Abundant around pond. See #10, #16, #30.
52	Sedge	*Carex athrostachya*	Common around ponds south of meadow
53	Reed Canary grass	*Phalaris arundinacea*	Swale, pure stand
54	False Dragonhead	*Physostegia parviflora*	Not common
55	Marsh Yellow-Cress	*Rorippa palustris*	Repeat; in quackgrass stand
56	White Clematis	*Clematis ligusticfolia*	Riparian/upland.
57	Black Hawthorn	*Crataegus douglasii*	
58	Pigweed	*Amaranthus retroflexus*	
59	Western Mugwort	*Artemisia ludoviciana*	
60	Marsh Yellow-Cress	*Rorippa palustris*	
61	Reed Canary Grass	*Phalaris arundinacea*	specimen not kept; see #66
62	Water Smartweed	*Polygonum amphibium*	
63	Smartweed	*Polygonum hydropiperoides(?)*	Pink flowers
64	Horsetail	*Equisetum fluviatale*	
65	Water Parsnip	*Sium suave*	and Water Hemlock, Cicuta maculata

66	Reed canary Grass	*Phalaris arundinacea*	
67	Quackgrass	*Agropyron repens*	
68	Fleabane	*Erigeron sp.(?)*	
69	Smartweed	*Polygonum hydropiperoides(?)*	Pink flowers
70	Smartweed	*Polygonum hydropiperoides(?)*	White flowers
71	Slender Beaked Sedge	*Carex athrostachya*	
72	Field Mint	*Mentha arvensis*	
73	Sago Pondweed	*Potamogeton pectinatus*	
74	Sago Pondweed	*Potamogeton pectinatus*	
75	Redhead Grass	*Potamogeton perfoliatus (richardsonii)*	
76	Variable Pondweed	*Potamogeton gramineus*	
77	Willow sp.	*Salix sp.*	
78	Willow sp.	*Salix sp.*	
79	Willow sp.	*Salix sp.*	
80	Sedge	*Carex aquatilis(?)*	or *rostrata?*
81	False Dragonhead	*Physostegia parviflora*	
82	Horsetail	*Equisetum fluviatale(?)*	
83	Reed Canary Grass	*Phalaris arundinacea*	
84	Willow sp.	*Salix sp.*	
85	White Cockle	*Lychnis alba*	
86	Smooth Brome	*Bromus inermis*	
87	Nootka Rose	*Rosa nutkana*	
88	Sand Dropseed	*Sporobolus cryptandrus*	
89	Scorpionweed?	*Phacelia(?)*	

Other Plants Present in Map Area (Not Collected, or Collected but unnumbered)

Walnut?	*Juglans sp.*
Pacific Crabapple	*Malus diversiflora*
Silver(?) Maple	*Acer saccharinum*
White(?) Ash	*Fraxinus americana(?)*
Arrow-Leaved Coltsfoot	*Petasetes sagittatus*
Prairie Pepper-Grass	*Lepidium densiflorum*
Common Dandelion	*Taraxacum officinale*
Baby's Breath	*Gypsophilia paniculata*
Mare's Tail	*Hippuris vulgaris*
Common Plantain	*Plantago major*
Great Mullein	*Verbascum thapsus*
Rabbit-Brush	*Chrysothamnus nauseosus*
Wild Strawberry	*Fragaria virginiana*
Stork's-Bill	*Erodium cicutarium*
Chicory	*Cichorium intybus*
Black Cottonwood	*Populus balsamifera trichocarpa*
Canada Thistle	*Cirsium arvense*
Bull Thistle	*Cirsium vulgare*
Pacific Willow	*Salix lucida lasiandra*
Crested Wheat Grass	*Agropyroncristatum*
Cheatgrass	*Bromus tectorum*
Ponderosa Pine	*Pinus ponderosa*
Choke Cherry	*Prunus virginiana*

White Sweet-Clover	*Melilotus alba*
Great Burdock	*Arctium lappa*
Blackberry	*Rubus ursinus(?)*
False Acacia (Black Locust)	*Robinia pseudo-acacia*
Manitoba Maple	*Acer negundo*
Mountain Ash	*Sorbus aucuparia*
Fireweed	*Epilobium angustifolium*
Alfalfa	*Medicago sativa*
Roudstem Bulrush	*Scirpus lacustris (acutus/vlaidus)*
Goat's Beard (Yellow Salsify)	*Tragopogon dubius*
Star Duckweed	*Lemna trisulca*
Snowberry	*Symphoricarpus albus*

Generalized Habitat Descriptions

Riparian Edge

Along a narrow strip of upland lying between the road and the meadows, subject to flooding during high water events is classified ad riparian edge. The edge vegetation consists of thickets of rose, willow, red osier dogwood, chokecherry, black hawthorn and saskatoon. Interspersed with these shrubs are occasional groves or single trees of introduced Manitoba maple, crab apple, alder and black cottonwood. Grass, sedge and a variety of non-native plants provide ground cover between shrub thickets and trees. Tall beggar's tick (*Bidens vulgata*), a red listed species, has been identified as one of the rare plants occurring in this habitat. Much of this habitat is contained within the Tranquille farm private property.

There is a less developed riparian edge along the dyke bordering the eastern boundary of the SFZ. It forms the division between park and city lands. That edge has developed since the dyke was constructed in 1973 and continues to expand. Beaver occasionally threatens the maintenance of the few large cottonwood trees here. These are highly valued and are essential for cavity nesting birds. Riparian edge habitat supports the most diverse fauna of the SFZ. Appropriate management here would assure long term benefits to vulnerable (blue list) painted turtle, Columbian sharp-tailed grouse, Lewis's woodpecker and many other less threatened species.

Grass/sedge meadows

Most of this habitat occurs on the former Lot 341 and westward to Culvert Pond. Domestic grasses with a few sedges are the main vegetation cover in this area which is hayed and winter grazed annually. Waterfowl, especially Canada geese, find this a choice habitat for brood rearing.

Wooded floodplain
This habitat is dominantly sandbar willow but there a few large pure stands of red osier dogwood near the river. There are two small groves of young cottonwood. Flooding, along with a heavy and extensive growth of reed canary grass limits the productivity and diversity of this habitat. Willows are still reoccupying areas dominated by shrubs prior to the fire of 1980 but cattle browsing have limited re-growth.

Semi-permanent wetland
This habitat includes Tranquille Pond, Culvert Pond and river back channels. The most productive part of this habitat is Tranquille Pond. It supports a rich stand of submergent growth attracting a wide variety of waterfowl and shorebirds especially in migrations. Extreme fluctuations in water levels reduce the value of this habitat for nesting and wetlands are slowly being filled up as the river delta ages. Heavily disturbed by cattle during the winter, species of annual plants appear to thrive from lack of competition and high nutrient loads. A blue listed species of plant, Dotted Smartweed *(Polygonum punctatum)* is found in this habitat.


Tranquille Special Features Zone in flood

Equiseteum flats
This habitat occupies an extensive area on the upland side of river sandbars and lesser areas near the river back channels. There is little diversity in this habitat with *Equiseteum fluviatale* occupying over 90% of existing ground cover. Sedges and sometimes water hemlock, are the only other plants to occur in significant numbers. The flats are used heavily by geese and cattle in spring and fall.