FRASER RIVER ER #76

ORIGINAL PURPOSE	To conserve the only remaining unaltered and uncommitted lower Fraser River floodplain islands
CURRENT PURPOSE	To preserve an unaltered cluster of mid river islands in the Fraser River Lowlands as an example of the accretion and erosion processes in this gravel reach of the Fraser and as an example of the stages of succession from pioneer colonizers through to mature deciduous floodplain forest and the wildlife these habitats support.

OVERVIEW

Date established:	24 Feb. 1977	**Location:**	6 km W of Chilliwack
ORC #:	3076	**Latitude:**	49º10'N
Map number:	92 G/1	**Longitude:**	122º01'W
Total Area:	177 ha	**Elevation:**	Approx. 5 metres

Access:	Accessible by boat, nearest departure points being Nicomen Island near Deroche or Island 22 near Chilliwack.
Biogeoclimatic Zone:	Coastal Western Hemlock (CWH)
Biogeoclimatic Variants:	CWHdm Dry Maritime
Ecosection:	Fraser Lowland
Region:	Lower Mainland
Management Area:	North Fraser

COMPOSITION

Physical:

The reserve is located in the gravel reach of the Fraser River which has many islands and gravel bars. The reserve islands are located in one of the widest sections of the river, about 2 km wide. Most of the Fraser downriver from Hope is constricted between dykes to widths of less than 1 km. The velocity of the flow of the river is fast enough at the reserve islands to move and deposit sand and gravel. Downriver the velocity decreases until, by Mission, gravel gives way to sand deposits and then eventually silt at the estuary. At the reserve islands the river is minimally affected by tides, although at Mission the tides can influence the water level by as much as 1.5 metres throughout the day. Mean monthly flows of the Fraser recorded at Mission vary seasonally from about 1500 to 9000 m^3/s. Low flows are in winter to early spring. Peak flows (freshet) are in late June to early July.

The reserve consists of: an older stage vegetated island with mature cottonwoods, several younger seral stage islands, eroding shoreline facing south and southeast towards the main channel of the Fraser River and accreting shorelines on its north and northwest shorelines plus on the downriver tip of the islands. There are several gravel swales cutting through the islands, with gravel/ sand/silt exposed at lower water; at lower water levels some of these swales retain quiet water ponds.

Seasonal variations in flow rework sediments, shift gravel and sand bars, and erode or cause accretion on different parts of the islands. All the islands are low-lying, flat-surfaced with good moisture availability. Even the highest land on the islands floods some years at freshet as can been seen by silt deposits on the tree

trunks. Between and within the islands are a network of swales that are dry at lower water levels and flood at freshet (2 to 3 months of the year), together with older swales that are gradually revegetating with shrubs. Freshet flows deposit silts along the swales, so over the years these swales gradually fill in and support grasses, shrubs and then trees.

Biological: The plant communities are primarily made up of early seral species able to colonize new alluvial substrates and tolerant of periodic flooding. Horsetails, willows, and black cottonwood are the most characteristic such plants. A band of scouring-rush typically occurs at the outer edge of the islands in situations prone to flooding and silt or sand deposition. The next community inward is usually dominated by willows, typically Sitka willow, but also Pacific, soft-leaved and Mackenzie willows, together with horsetails and bentgrass. Pacific ninebark may also occur with the willow. The most stable and extensive community is that dominated by black cottonwood. Abundant understory shrubs are red-osier dogwood, salmonberry, thimbleberry and common snowberry. Other trees recorded in the reserve include vine maple, bigleaf maple, red alder, paper birch, flowering dogwood, and a few conifers (Douglas-fir and western redcedar).

The seasonally dry swales have their own ecology with a scattering of colonizing bunchgrasses and herbaceous plants such as brown-eyed Susan. The swales provide extensive edge zones and in season provide habitat for several bird species, and insects such as butterflies and grasshoppers. Isolated pools along the swales provide habitat for salmon fry and are attractive to herons.

Invasive species include reed canarygrass amongst the horsetail, Himalayan blackberry (which in a few areas is extensive throughout the understory), and a scattering of English ivy, 'birdsfoot' English ivy, and holly.

At least three beaver houses are present and there are extensive beaver runs in some locations. Deer Mice, Coyotes and Black-tailed Deer are present. Tracks of temporary visitors such as Black Bear, Bobcat and Red Fox are occasionally found in silt deposits left by higher water back eddies.

Amphibians and reptiles include the Western Toad, Pacific Chorus Frog, and Garter Snake. Molluscs include freshwater clams and snails. Pink Salmon spawn along island shorelines where the redds are sometimes visible.

The largely deciduous woods, extensive edge zone, water and gravel bars provide excellent feeding, loafing and nesting habitat for birds. A pair of Bald Eagles have nested over seven years (2004-2011) in a mature cottonwood near the middle of the Reserve. In late October, with salmon carcasses plentiful, up to 34 eagles have been counted in half a day either on the gravel bars or perched in trees. Hundreds of Glaucous-winged Gulls and Thayer's Gulls loaf or join in the feast. In spring over a hundred Violet-green Swallows have been observed feeding above the islands and river. At times up to 200 Mallards have been seen on the quiet waters of the central slough. More than 20 Yellow-rumped Warblers were seen together feeding on red-osier dogwood fruit. The bird list records 62 species on the islands or visible from the islands.

MANAGEMENT CONCERNS

SIGNIFICANT SPECIES	BC LIST STATUS	COSEWIC STATUS	CF PRIORITY
soft-leaved willow	Yellow		4
Violet-green Swallow	Yellow		2

THREATS

Climate Change: The floodplain islands within this reserve may be subject to increased flooding during the winter and spring months, followed by lower water levels during the drier seasons. These changes in flow may alter the shape and biological composition of the islands by altering the patterns of erosion and accretion and subsequently altering the terrestrial habitat. Extreme highwater events due to unseasonably warm weather in late fall or winter can damage the salmon redds.

Other changes in water quality such as temperature and nutrient load may also affect the ecological communities by impacting their productivity and habitat stability. These effects would, of course, be reflected in the terrestrial community composition.

Geomorphology: Changing river currents leads to habitat loss and erosion, but accretion is also occurring.

Human Disturbance: Illegal camping, mostly associated with people salmon fishing during the late summer and fall, occurs and is concentrated on the upriver tip of the islands. Even temporary latrines have been built by campers and garbage and several fire rings are often visible. Most of this impact is limited to the gravel shore and immediate vegetated upland of the upriver island tip; garbage and fire pits are usually washed away during freshet.

Cottonwood trees were cut along eroding shorelines in 1985, 1986 and 1987 by Dept of Public Works. This was done to prevent trees from falling into the river and causing a navigational hazard. Fortunately this cutting no longer happens.

A marijuana growing operation with extensive irrigation piping and water holding tank was found in 2004 and was removed by wardens and the Park Ranger in spring 2005, with no further evidence since then.

Harvesting of horsetails for sale to floral shops occurs. One picker explained to the wardens that florists require at least a 24" long straight stem. Evidence of harvesting was seen from 2004 to 2009. In 2008 wardens found large bales of abandoned stems, estimated at about 5000 stalks. Rubber gloves were fastened to trees, likely marking harvesting locations. This may not be having too negative of an impact since the horsetail is fairly robust, and only those over 24" tall are harvested, but that impact should be assessed.

	Shotgun shells from a blind along the shore were found in 2009, and in previous years. First Nations people fish with gill nets in the fall with one end of the net anchored on shore of the upstream southern island and the other end of the net fastened to a power boat that powers the net downriver through the back-eddy, with minimal impact to the reserve. Fixed-wing aircraft landing has been observed since November 2010 on the dry gravel bars between the islands. This is considered a major disturbance to the reserve.
Invasive Species	Himalayan blackberry are increasing their range and density on the island. It is not clear whether their spread will out-compete the salmonberry understory under the more mature cottonwoods. They are too extensive to remove from the downstream islands. Blackberries are densest in a few areas with smaller trees and open canopy. Reed canarygrass occurs in many locations amongst the horsetail; again it is not clear whether it will out compete the horsetail. Small patches of ivy and holly occur, and these could easily be removed.
PAST RESEARCH	"The Fraser River Ecological Reserve: Beaver Ecology and a Biosurvey", unpublished research paper by Doreen Liner, Dave Kane and Alan McLeod for Dr. Fred Bunnell, UBC Faculty of Forestry, 1983. "Fraser River Islands Ecological Reserve #76: Summary of observations made from 1985 to 1992", unpublished paper by warden Anthea Farr in February 2007.
RESEARCH OPPORTUNITIES	The reserve supports a relatively undisturbed cluster of mid-river islands demonstrating accretion and erosion processes and vegetation succession along the gravel reach of the Fraser. Opportunities for research include: - longitudinal studies, change over time - native cottonwood growth compared to hybrids - species adaptation to seasonal flooding - biological index of community compositional change - nutrient-poor selection - plant stabilization of gravel and sand deposits - invasive species and their spread in a natural environment

SCIENTIFIC NAMES OF SPECIES MENTIONED IN THE FRASER RIVER ER ACCOUNT

Flora

alder, red (*Alnus rubra)*
bentgrass sp. *(Argrostis sp.)*
birch, paper (*Betula papyrifera)*
blackberry, Himalayan *(Rubus discolor)*
brown-eyed Susan (Gaillardia aristata)
canarygrass, reed (*Phalaris arundinacea)*
cottonwood, black (*Populus trichocarpa* ssp. *trichocarpa)*
dogwood, flowering (*Cornus nuttallii)*
dogwood, red-osier (*Cornus stolonifera)*
Douglas-fir, coast (*Pseudotsuga menziesii)*
holly, English *(Ilex aquifolium)*
horsetail, common (*Equisetum arvense)*
horsetail, meadow (*Equisetum pratense)*
ivy, English (*Hedera helix)*
maple, bigleaf (*Acer macrophyllum)*
maple, vine (*Acer circinatum)*
ninebark, Pacific (*Physocarpus capitatus)*
redcedar, western (*Thuja plicata)*
salmonberry (*Rubus spectabilis)*
scouring-rush (*Equisetum hyemale)*
scouring-rush, smooth (*Equisetum laevigatum)*
snowberry, common (*Symphoricarpos albus*)
thimbleberry (*Rubus parviflorus)*
willow, MacKenzie (*Salix prolixa)*
willow, Pacific (*Salix lucida* ssp. *lasiandra)*
willow, Sitka (*Salix sitchensis)*
willow, soft-leaved (*Salix sessilifolia)*

Fauna

Bear, American Black (*Ursus americanus)*
Beaver, American (*Castor canadensis)*
Bobcat (*Lynx rufus)*
Coyote (*Canis latrans)*
Deer, Black-tailed *(Odocoileus hemionus hemionus)*
Eagle, Bald (*Haliaeetus leucocephalus)*
Fox, Red (*Vulpes vulpes)*
Frog, Pacific Chorus (*Pseudacris regilla) [*formerly Pacific Tree Frog (*Hyla regilla)]*
Gull, Glaucous-winged (*Larus glaucescens)*
Gull, Thayer's (*Larus theyeri)*
Heron, Great Blue (*Ardea herodias)*
Mallard (*Anas platyrhynchos)*
Mouse, Deer (*Peromyscus maniculatus)*
Salmon, Pink (*Oncorhynchus gorbuscha)*
Snake, Common Garter (*Thamnophis sirtalis)*
Swallow, Violet-green (*Tachycineta thalassina)*
Toad, Western (*Bufo boreas*)
Warbler, Yellow-rumped (*Dendroica coronata)*