

Report Date: 24-02-2012

Metadata Data Set Name: CWS Fraser Lowland Wetland Inventory Loss Study 1989 – 2009 version 1.0

1.1 Citation Information:

8.1 Originator: D. Major, K. Moore and A. Tanaka
8.2 Publication Date: 2011
8.4 Title:

Environment Canada (Canadian Wildlife Service) and Metro Vancouver. 2011. CWS Fraser Lowland Wetland Inventory Loss Study 1989 – 2009. Digital datafiles.

David Major, Metro Vancouver
Kathleen Moore, Canadian Wildlife Service, Environment Canada
Andrea Tanaka, Canadian Wildlife Service, Environment Canada

1 Identification Information

1.1 Citation Information:

8.1 Originator: D. Major, K. Moore, D. Buffett, T. Tam
8.2 Publication Date: 2012
8.4 Title:

An Analysis of Loss and Conservation Prioritization of Fraser Lowland Wetlands (1989 – 2009), in proceedings of the 2011 Salish Sea Ecosystem Research Conference, February 2012.

David Major, Metro Vancouver
Kathleen Moore, Canadian Wildlife Service, Environment Canada
Dan Buffett, Ducks Unlimited Canada
Tammy Tam, Ducks Unlimited Canada

1.1 Citation Information:

8.1 Originator: K. Moore, K Roger
8.2 Publication Date: 2003
8.4 Title:

Urban and Agricultural Encroachment onto Fraser Lowland Wetlands, 1989 to 1999. in proceedings of the 2003 Georgia Basin/Puget Sound Research Conference, December 2003.

1.1 Citation Information:

8.1 Originator: P. Ward, K Moore, R. Kistriz
8.2 Publication Date: 1992
8.4 Title:

Wetlands of the Fraser Lowland, 1989: An Inventory

8.7.1 Series Name: Canadian Wildlife Service Technical Report Series
8.7.2 Issue Identification: Tech Rep. No. 146

1.1 Citation Information:

8.1 Originator: P. Ward
8.2 Publication Date: 1992
8.4 Title:

Wetlands of the Fraser Lowland, 1989: Summary Report

8.7.1 Series Name: Canadian Wildlife Service Technical Report Series
8.7.2 Issue Identification: Tech Rep. No. 156

1.1 Citation Information:

8.1 Originator: M. McPhee, P. Ward
8.2 Publication Date: 1994

8.4 Title:

Wetlands of the Fraser Lowland: Ownership, Management and Protection Status, 1992

8.7.1 Series Name:

Canadian Wildlife Service Technical Report Series

8.7.2 Issue Identification:

Tech Rep. No. 200

1.2 Description

1.2.1 Abstract:

In 1989, the Canadian Wildlife Service (CWS) of Environment Canada undertook a project to map and classify the wetlands of the Fraser Lowland (Ward et al. 1992). The study area spanned from the mouth of the Fraser River to Hope, south to the US border, below 150m elevation, and seaward to -10m below lowest normal tide level. The wetlands were delineated using primarily late 1980s 1:12,000 – 15,000 air photos, a minimum mapping unit (MMU) of 0.5ha, and the Canadian Wetland Classification System (to class (bog, swamp, marsh, fen, and shallow water), form and vegetation type). Field spot-checking was conducted in all wetland units in 1989. The polygons were digitized from the air photos and first georeferenced to 1:50,000 digital basemaps, but later between 2000 and 2001 georeferenced to 1:20,000 BC government digital basemaps (TRIM) along with some minor corrections..

In 2002-03, CWS used 1999 orthophotos to detect loss in 320 wetlands to identify locations and total area affected by urban and agricultural encroachment between 1989 and 1999 (Moore and Rogers, 2004). The scope of the loss research included only those freshwater wetlands outside of the jurisdiction of the Fraser River Estuary Management Program (FREMP). Results were documented in a poster submitted to the Georgia Basin/Puget Sound Research Conference in 2003 (see conference proceedings for abstract).

In 2010, MetroVancouver used 2009 orthophotos and collaborated with CWS to ensure the same methodology was used to determine loss in these same 320 wetland units. Additional sources of information to assist with wetland change included 1989 air photos, 1999 digital orthophotos, 2004 digital orthophotos, Google Maps, Google Street View, Bing Maps, and Bing Bird's Eye View. Staff of MetroVancouver and CWS revisited each loss polygon to confirm the wetland boundaries and attributes. Additionally, the original shapefiles were converted to a geodatabase. Results were documented in a presentation to the 2011 Salish Sea Ecosystem Research Conference (see conference proceedings for extended abstract).

The CWS Fraser Lowland Wetland Inventory Loss Study 1989 – 2009 version 1.0 geodatabase is a useful regional-scale product in which to monitor for wetland loss in the future. For a definitive, standardized inventory of all wetlands in the Lower Mainland and Fraser Valley however, it will soon be replaced with Sensitive Ecosystem Inventory (SEI) mapping at a scale of 1:5,000 - 10,000 for much of this area, and with much finer vegetation units. SEI mapping will be available from MetroVancouver in June 2012. For the wetted side of the dyke, much finer and more up-to-date mapping of habitat is available from FREMP. The user is advised to use MetroVancouver SEI or FREMP mapping as the preferred wetland inventory wherever it is available. CWS intends to use the CWS Fraser Lowland Wetland Inventory Loss Study 1989-2009 geodatabase as a baseline specifically for tracking wetland loss into the future using the same methodology and regional-scale polygons as in the previous two time periods.

www.metrovancouver.org

www.bieapfrempp.org

2011 Geodatabase File Structure:

CWS_wetland_loss_study_v1.mdb

Feature classes:

Study_Areas (study area boundary with polygon outlining the extents of the study area)

Wetlands_Dissolve (existing wetland units, includes info about the location, loss status and size of the wetlands)

Wetlands (all wetland polygons that have made up a wetland unit since 1989, existing and lost. A single wetland unit can consist of many polygons. Includes info about the location, loss status and size of the wetlands.)

MDunn_eelgrass_above50percent (CWS eelgrass mapping from 1993 for Boundary Bay and Roberts Bank for *Zostera japonica* and *Zostera marina*. This map shows combined polygons for eelgrass density greater than 50%)

Tables

tbl_Classification89 (wetland class and form by percent cover for each wetland unit as of 1989, according to the Canadian Wetland Classification System, for Technical Report #146)

tbl_Vegetation89 (vegetation type by percent cover for each wetland unit as of 1989, according to the Canadian Wetland Classification System, for Technical Report #146)

tbl_Management92 (ownership and management as of 1992 for Technical Report #200, note some municipal boundaries and names have changed since 1992)

tbl_Protection92 (conservation protection status as of 1992 for Technical Report #200)

tbl_MunicipalityLUT (look up table for municipality names)

tbl_LossByUnit (a list of all wetland units summarizing the amount of loss in hectares that occurred between 89-99 or 99-09 or not at all)

tbl_Loss99 (a list of all wetland units and polygon numbers with detailed information on the amount of loss in hectares, by percent, and by cause between 1989 and 1999)

tbl_Loss09 (a list of all wetland units and polygon numbers with detailed information on the amount of loss in hectares, by percent, and by cause between 1999 and 2009)

tbl_CWS_Eelgrass (a list of wetland units with eelgrass from a 1993 mapping project for *Zostera japonica* and *Zostera marina* density in Boundary Bay and Roberts Bank, only those areas with greater than 50% density are shown)

Layer Files

MDunn_Eelgrass_above50percent (symbolized map of eelgrass; derived from

MDunn_Eelgrass_above50percent feature class)

Wetland_as_of_1989 (symbolized map of wetlands as of 1989; derived from Wetlands feature class using the “status” field)

Wetland_as_of_1999 (symbolized map of wetlands as of 1999; derived from Wetlands feature class using the “status” field)

Wetland_as_of_2009 (symbolized map of wetlands as of 2009; derived from Wetlands feature class using the “status” field)

Wetland_loss_Symbology (symbolized map of those wetlands lost between 1989 and 2009, including those wetlands that were not assessed; derived from Wetlands feature class using the “status” field)

Wetland_loss_Symbology01 (symbolized map of those wetlands lost 1999 and 2009 and those wetlands that were not assessed – it does not include those wetlands still in existence in 2009)

Detailed History and original methodology of the Fraser Lowland Wetland Inventory follows:

Note: field names discussed below have changed since the conversion to a geodatabase. Refer to section Entity Type Label and Methodology Description for current (2011) definitions and structure.

The Fraser Wetland Inventory (1989) was documented in a series of three technical reports. The purpose of the first report was to answer the following questions: Where are the remaining wetlands? What size are they? What wetland classes do they represent? What state are they in? The wetland units were classified according to the Canadian Wetland Classification System. The inventory showed that there were 41,906 hectares of wetland left in the study area, representing 13.6% of the total area. Nearly two-thirds (64.4%) of the total wetland area was accounted for by the 'shallow water' wetland class, most of which was comprised of large tidal flats at the mouth of the Fraser River and in Boundary Bay. The other third included 14.6% marsh, 7.5% gravel bar, 5.7% fen, 4.5% bog and 3.4% swamp. About 72% of the wetland area in the Fraser Lowland was given the highest of a three-level rating system, i.e. 'undisturbed'. Excluding the tidal flat category ('shallow water' wetland class), 60% of the remaining wetland area has the highest rating. The second report was a shorter document which excluded the detailed descriptions of each wetland unit and accompanying inset maps. The third report answered the following questions: What is the ownership status of the wetlands identified in the 1989 inventory? What is the current level of protection for each of these wetlands? Which agencies are responsible for managing public lands on which these wetlands are located? What is meant by 'protection' is discussed and the criteria used to categorize the Fraser Lowland wetlands for this report are described. The results of this inventory show that the majority (76.9%) of Fraser Lowland wetlands as of 1992 were owned by the Provincial Crown; 13.3% are privately owned; 4.6% are municipal or regional lands; and the Federal Crown and Indian Reserves each account for 2.6%. The results also showed that 12.8% have a high level of protection; 68.8% have medium protection and 15.8% have a low level or no protection. In total, government agencies have management authority over 89% of the wetland area in the Fraser Lowland: Provincial Government 75.1%; Federal Government 6.5%; regional and municipal governments 4.5%; and Indian Bands 2.6%.

In 2000, this database was modified by redigitizing from a raster-based line work to a vector-based line work, and fit to a 1:20,000 scale basemap rather than the previous 1:50,000 basemap. This was done through heads-up digitizing using 1 m orthophotos in ArcView. In addition, another 36 wetland units were added that had been missed in the first mapping exercise. Similarly, 1:2,500 habitat polygons were received from FREMP (Fraser River Estuary Management Program) in 2000 and were used to replace our original coarser-scale versions of their polygons. The linework from all 5 FREMP habitat classes were included in our inventory, but these individual classes were dissolved into one, so FREMP's habitat distinctions are not included in our habitat. These FREMP polygons were renumbered to correspond with the wetland inventory ID numbers. Some of the CWS wetlands were only partially included in the FREMP inventory - these were labeled as "part" FREMP in the `frempp_inv` field. The FREMP linework was used when possible, even if the whole wetland was only partially FREMP. Since it was added to our inventory, FREMP found some problems with their linework, and in Spring 2003 FREMP conducted more field interpretation, and redigitized the linework to a better control and was updated again in 2007. However, there is no plan to update the linework in this wetland inventory. Therefore, for accurate FREMP linework and information, contact FREMP at mail@bieapfrempp.org

In 2002, each wetland was assessed for human disturbance that occurred between 1989 and 1999. This was done using 1995 and 1999 orthophotos. Although the inventory highlighted changes occurring before 1999, the 1995 orthos helped this interpretation. The portion of each wetland that was urbanized was digitized as a polygon to allow for an area calculation on total wetland area lost between 1989 and 1999. This assessment was conducted only on wetlands outside of the FREMP area. Those wetlands that were only partially in FREMP were only assessed on the area outside of the FREMP area.

Change was viewed along a temporal scale, that is, through comparing the polygon on the `Wetland_change` layer (the layer being edited) to orthophotos from 1995 and 1999. The orthophotos were viewed at a resolution of 0.5 metres and 1 metre. Polygons representing the current size of wetlands were digitized between a scale of 1:1,000 and 1:1,500. If a loss of area had been identified, it was denoted on the table depending upon the time period it had occurred within ('Loss before 1995', 'Loss after 1995, prior to 1999', or 'Loss before 1999'). Wetlands identified as being within FREMP areas were not of concern for this project due to different scale used, etc. and were so labeled as "FREMP". Areas that were labeled as 'part' of FREMP, however were inspected for loss (the part of the polygon which was not within FREMP). These were recorded as 'Partly assessed-Loss' or 'Partly assessed - No Loss'. Of note: a correction was made to a

1989 polygon of the Fraser River Foreshore Park using habinv_tmp.shp file so as to allow for assessment (noted as Correction- No Loss').

Throughout 2002-2003, the wetland shapefile was checked many times for any problems in the dataset, and these were corrected. A few changes were made to polygons themselves, these are listed below:

- Wetland Unit # 423 – the boundary of this wetland was changed, to reflect a more accurate portrayal of its boundary. At the original time, the digitizing was probably done by heads-up, with few reference points. Now we can see the polygon boundaries more clearly, using the 1999 and 1995 orthophotos. It is also possible that this wetland was in the midst of being constructed or altered, therefore the boundary was not very representative of the resultant wetland.
- Wetland Unit # 51 - It was felt that the original digitized boundary overestimated the wetland extent, and this was corrected - it was not felt that this was a loss, but rather a misinterpretation.
- Wetland Unit #111 – This was at some point removed from the digital dataset, and was added again to the wetland shapefile, using a scanned and georeferenced image of the original mylar drawing.
- Wetland Unit # 32 - The NW boundary was changed.

In March 2003 each polygon that was labelled as a wetland “Loss” was categorized into the type of landuse that encroached on the wetland. Using the 1999 and 1995 orthophotos, polygons were classified into losses to residential, agriculture, transportation, and others. The field “type_encro” was added to the database for this information. Those areas that were lost to agricultural encroachment were further classified, as different types of agriculture can have different values to birds. The field “agric_type” was added to show this information.

Notes: wetland #171 does not exist.

Polygons representing eelgrass were added in 2003 from a CWS eelgrass inventory completed in 1992/93 based on transects and plots established in Boundary Bay and Roberts Bank. Two source files were used, one of each eelgrass species, *Zostera marina* (tzmcl_bb) and *Zostera japonica* (tzjcl_bb). The eelgrass was queried for areas representing more than 50% eelgrass species. The resultant polygons from both shapefile queries were merged together, as we did not require any distinction between the two species.

In 2002 there were 4 wetlands that were identified as new wetland habitat. Two of these are new habitat on either side of a stream in Mission. One is an addition to a current wetland in Surrey, and the other was an enhancement project in Langley, where previous wetland has been destroyed. These 4 polygons (three wetland units) are noted as having Wetland Unit numbers 9997, 9998, and 9999.

1.2.2 Purpose:

The CWS Fraser Lowland Wetland Inventory Loss Study 1989 – 2009 geodatabase is a useful regional-scale product in which to monitor for wetland loss in the future. For a definitive, standardized inventory of all wetlands in the Lower Mainland and Fraser Valley however, it will soon be replaced with Sensitive Ecosystem Inventory (SEI) mapping at a scale of 1:5,000 - 10,000 for much of this area, and with much finer vegetation units. SEI mapping will be available from MetroVancouver in June 2012. For the wetted side of the dyke, much finer and more up-to-date mapping of habitat is available from FREMP. The user is advised to use MetroVancouver SEI or FREMP mapping as the preferred wetland inventory wherever it is available. CWS intends to use the CWS Fraser Lowland Wetland Inventory Loss Study 1989-2009 geodatabase as a baseline for tracking wetland loss into the future using the same methodology and regional-scale polygons as in the previous two time periods.

1.3 Time Period Of Content

9.2 Multiple Date/Times
9.1.1 Calendar Date: 1989-2009
1.4 Status
1.4.1 Progress: completed: Summer 2011

1.5 Geographic Extent

1.5.1 Description of Geographic Extent:
Lower Mainland/Fraser Valley

1.5.2 Bounding Rectangle Coordinates

1.5.2.1 West Bounding Coordinate: -123.5
1.5.2.2 East Bounding Coordinate: -121.5
1.5.2.3 North Bounding Coordinate: 49.5
1.5.2.4 South Bounding Coordinate: 49

1.6 Keywords

1.6.1.1 Theme Keyword Thesaurus: none
1.6.1.2 Theme Keyword: wetland
1.6.1.2 Theme Keyword: wetland inventory
1.6.1.2 Theme Keyword: Fraser Lowland
1.6.1.2 Theme Keyword: wetland loss
1.6.2.1 Place Keyword Thesaurus: none
1.6.2.2 Place Keyword: British Columbia
1.6.2.2 Place Keyword: Fraser Lowland
1.6.2.2 Place Keyword: Lower Mainland

1.8 Access Constraints:

1.9 Use Constraints:

This data is of a technical nature and includes Government of Canada information such as geographical information, formulae, reference values, statistical data, forecasts and the like. While Environment Canada has employed reasonable efforts, whenever feasible, to ensure the currency, accuracy and precision of this data, some of this material has limitations due to its scale, resolution, date of capture and existing technical restrictions relating to the original source materials. Furthermore, the material or any data derived using same is subject to interpretation. Users are responsible for verifying that the data is appropriate for the use or application for which they wish to employ it. Environment Canada and, more generally, the Government of Canada make no representation or warranty of any kind, either express or implied, as to its fitness for any particular use, and Environment Canada and, more generally, the Government of Canada do not assume nor accept any liability arising from any use of this data and information.

This dataset was developed to assist with general conservation planning, and is not a substitute for site-specific surveys usually required for environmental assessment.

THIS DATASET IS SUBJECT TO THE TERMS AND CONDITIONS OF A DATA LICENCE AGREEMENT.

For finer-scale and more up-to-date habitat mapping:

www.metrovancouver.org

www.bicapfrempp.org

1.10 Point of Contact

10.1 Contact Person Primary

10.1.1 Contact Person:

Kathleen Moore

10.1.2 Contact Organization:

Environment Canada, Canadian Wildlife Service

10.4 Contact Address

| | |
|---------------------------|---------------------------|
| 10.4.1 Address Type: | Mailing Address |
| 10.4.2 Address: | 5421 Robertson Road, RR#1 |
| 10.4.3 City: | Delta |
| 10.4.4 State or Province: | B.C. |
| 10.4.5 Postal Code: | V4K 3N2 |
| 10.4.6 Country: | Canada |

1.14 Native Data Set Environment: ArcGIS geodatabase

2 Data Quality Information

2.1 Attribute Accuracy

2.1.1 Attribute Accuracy Report:

(1989) See Technical Reports #146 and #200 on methodology. Wetlands were delineated from mainly 1986 1:12,000 colour air photos. In addition to these, some black and white air photos ranged from 1:10,000 to 1:40,000 taken in 1983, 84, or 87 were used. Wetlands one-half hectare or larger were outlined on the photos and field checked during the summer of 1989. Each wetland site was visited to verify these wetland boundaries, to classify each wetland unit, and to estimate the proportion of different vegetation types and the degree of disturbance. This is a regional inventory and is not meant to replace site-specific evaluations.

(2000-01) An additional 36 wetlands were added that had been missed on first exercise.

(2002-3) Loss / No Loss attributes were added in comparison of wetlands between 1989 to orthophotos from 1999.

(2003) Classification of types of encroachment were based on interpreting ortho photos from 1999 and supplemented by orthos from 1995. There was little ground truthing conducted in this phase, therefore the classifications were done to the best ability with the resources available.

(2011) Classification of types of encroachment were based on interpreting orthophotos from 2009 and supplemented with information from other sources and imagery. Ground truthing was conducted on all changed polygons.

2.3 Completeness Report:

N/A :refer to publication for assessment

2.4 Positional Accuracy

2.4.1 Horizontal Positional Accuracy

2.4.1.1 Horizontal Positional Accuracy Report:

Unknown. (1989, 2000, 2002 and 2011) The wetland polygons were originally typed onto air photos, hand digitized and then orthorectified using ground control points from 1: 1:50,000 NAD27 NTS maps applying a non-linear warp function. These polygons were then re-georeferenced to 1:20,000 TRIM NAD 83 digital base maps. Also in 2002, the 1999 orthophotos were viewed at a resolution of 0.5 metres and 1 metre. Polygons representing the current size of wetlands were digitized between a scale of 1:1,000 and 1:1,500. In 2011 the wetland change was assessed at a scale of 1:1,500 and 1:2,500 and digitized at a scale of 1:1,000 using 2009 orthophotos at a scale of 1:1,000.

2.4.2.1 Vertical Positional Accuracy Report:

not applicable

2.5 Lineage

2.5.1 Source Information not applicable

99.2.5.1 Methodology

99.2.5.1.1 Methodology Type:

99.2.5.1.3 Methodology Description:

2011 Methodology:

The methodology followed the 1989-99 methodology as closely as possible. Only wetland loss due to anthropogenic activity was assessed. Only wetlands outside of the FREMP area were assessed. Some wetlands are partly inside FREMP and partly out – only the portion outside was assessed. The same categories of loss were used (see Entity Type Label) and include: agriculture, commercial, golf course, in transition, landfill, manufacturing, residential, transportation. 2009 orthophotos were used and

supplemented with the original 1986 typed air photos (to aid in identification of “true” change), the 1999 orthophotos (to understand the 89-99 loss polygons to maintain consistency in interpretation), plus other imagery to aid in interpretation. Wetland polygons were overlaid onto the 2009 orthophotos in ArcGIS at a scale of 1:1,500 and 1:2,500. Where loss was identified, it was digitized at 1:1,000. To maintain consistency, staff involved with the original 89-99 wetland loss analysis were consulted and validated each loss polygon. Errors in the 1989-99 interpretation were found for wetland units #197, #200, #202, and #397. These had been intended to be “loss” polygons but were missed. These were added to the “tbl_Loss99” and with a note.

2011 Limitations:

Because of the difference in resolution of orthophotos between the three time periods (1989, 99, 09) it was important to check against the original typed airphotos to check for true change. In many instances, it was just the imprecision of the original linework based on lower resolution imagery that appeared to be a change when overlaid onto current orthophotos. In addition, wetlands and waterlevels are dynamic systems and shapes of sloughs and wetlands can change naturally but not due to an anthropogenic loss. Again, it is important to cross-check against the original typed airphotos. The 1999 orthophoto coverage did not extend eastward past Matsqui Island and therefore the change analysis was based on 1986 air photos and 2004 orthophotos.

3 Spatial Data Organization Information

3.2 Direct Spatial Reference Method:

4 Spatial Reference Information

4.1 Horizontal Coordinate System Definition

4.1.2 Planar

| | |
|--|------------------------------------|
| 4.1.2.1.1 Map Projection Name: | Transverse Mercator |
| 4.1.2.2.1 Grid Coordinate System Name: | Universal Transverse Mercator(UTM) |
| 4.1.2.2.2.1 UTM Zone Number: | 10 |

False Northing:

0

Geodetic Model

Horizontal Datum Name:

North American Datum of 1983

Ellipsoid Name:

Geodetic Reference System 80

5 Entity and Attribute Information

5.2 Overview Description

5.2.1 Entity and Attribute Overview:

tbl_Classification89 (wetland class and form by percent cover for each wetland unit as of 1989, according to the Canadian Wetland Classification System, for Technical Report #146)

Entity Type Label

Unit_no

Entity Type Definition:

Unique to each wetland unit. One unit can have more than one polygon.

Entity Type Label

Classification

Entity Type Definition:

Wetland class of the wetland unit as determined in 1989 using the Canadian Wetland Classification System.

Entity Type Label

Form

Entity Type Definition:

Wetland form of the wetland unit as determined in 1989 using the Canadian Wetland Classification System.

Entity Type Label

PercentClass

Entity Type Definition:

Percent of the wetland unit by wetland class as determined in 1989 using the Canadian Wetland Classification System.

Entity Type Label

AreaClass

Entity Type Definition:

Area in hectares of the wetland unit by wetland class as determined in 1989 using the Canadian Wetland Classification System.

tbl_Vegetation89 (vegetation type by percent cover for each wetland unit as of 1989, according to the Canadian Wetland Classification System, for Technical Report #146)

Entity Type Label

Unit_no

Entity Type Definition:

Unique to each wetland unit. One unit can have more than one polygon.

Entity Type Label

VegCover

Entity Type Definition:

Wetland vegetation type of the wetland unit as determined in 1989 using the Canadian Wetland Classification System.

Entity Type Label

PercentCover

Entity Type Definition:

Percent of the wetland unit by wetland vegetation type as determined in 1989 using the Canadian Wetland Classification System.

Entity Type Label

AreaCover

Entity Type Definition:

Area in hectares of the wetland unit by wetland vegetation type as determined in 1989 using the Canadian Wetland Classification System.

tbl_Management92 (ownership and management as of 1992 for Technical Report #200, note some municipal boundaries and names have changed since 1992)

Entity Type Label

Unit_no

Entity Type Definition:

Unique to each wetland unit. One unit can have more than one polygon.

Entity Type Label

Owner

Entity Type Definition:

Owner of the wetland unit by category Municipal, Provincial, Federal, Indian Reserve as determined in 1992.

Entity Type Label

MgtPrimary

Entity Type Definition:

Primary agency responsible for a management agreement for a wetland unit as determined in 1992.

Entity Type Label

MgtSecondary

Entity Type Definition:

Secondary agency responsible for a management agreement for a wetland unit as determined in 1992.

Entity Type Label

AreaOM

Entity Type Definition:

Area in hectares of the wetland unit by owner and primary management agency as determined in 1992.

Entity Type Label

PercentOM

Entity Type Definition:

Percent of the wetland unit by owner and primary management agency as determined in 1992.

tbl_Protection92 (conservation protection status as of 1992 for Technical Report #200)

Entity Type Label

Unit_no

Entity Type Definition:

Unique to each wetland unit. One unit can have more than one polygon.

Entity Type Label

Protection

Entity Type Definition:

Level of protection (high, medium or low) as determined in 1992 based on a number of criteria including tenure, land use designation, and degree of human impact.

Entity Type Label

PercentProt

Entity Type Definition:

Percent of the wetland unit by level of protection (high, medium or low) as determined in 1992 based on a number of criteria including tenure, land use designation, and degree of human impact.

Entity Type Label

AreaProt

Entity Type Definition:

Area in hectares of the wetland unit by level of protection (high, medium or low) as determined in 1992 based on a number of criteria including tenure, land use designation, and degree of human impact.

tbl_MunicipalityLUT (look up table for municipality names)

Entity Type Label

Municipal1

Entity Type Definition:

Three letter abbreviation for each municipality in the Greater Vancouver Regional District (MetroVancouver) and the Fraser Valley Regional District. .

Entity Type Label

Name

Entity Type Definition:

Full name of each municipality in the Greater Vancouver Regional District (MetroVancouver) and the Fraser Valley Regional District. .

tbl_LossByUnit (a list of all wetland units summarizing the amount of loss in hectares that occurred between 89-99 or 99-09 or not at all)

Entity Type Label

Unit_no

Entity Type Definition:

Unique to each wetland unit. One unit can have more than one polygon.

Entity Type Label

Wetlands_Name

Entity Type Definition:

Wetland unit name based on geographic location.

Entity Type Label

Tbl_MunicipalityLUT_Name

Entity Type Definition:

Municipality the wetland is located in using names listed in tbl_MunicipalityLUT.

Entity Type Label

1989-1999_Loss

Entity Type Definition:

Area in hectares lost to anthropogenic causes (urban and agriculture) by wetland unit.

Entity Type Label

1999-2009_Loss

Entity Type Definition:

Area in hectares lost to anthropogenic causes (urban and agriculture) by wetland unit.

tbl_Loss99 (a list of all wetland units and polygon numbers with detailed information on the amount of loss in hectares, by percent, and by cause between 1989 and 1999)

Entity Type Label

Unit_no

Entity Type Definition:

Unique to each wetland unit. One unit can have more than one polygon.

Entity Type Label

Poly_no

Entity Type Definition:

Individual polygon number within a wetland unit. One unit can have more than one polygon.

Entity Type Label

Area_loss

Entity Type Definition:

Area in hectares lost to anthropogenic causes (urban and agriculture) by polygon number within a wetland unit.

Entity Type Label

Perc_loss

Entity Type Definition:

Percent of the wetland unit (not individual polygon) lost to anthropogenic causes (urban and agriculture).

Entity Type Label

Tot_loss_h

Entity Type Definition:

Total area in hectares of the wetland unit (not individual polygon) lost to anthropogenic causes (urban and agriculture).

Entity Type Label

Loss_class

Entity Type Definition:

Proportion of a wetland unit (not individual polygon) lost to anthropogenic causes (urban and agriculture) expressed in a percent class (0-5%, 5-15%, 15-30%,30-50%, 50-100%).

Entity Type Label

Type_encro

Entity Type Definition:

Anthropogenic cause attributed to loss within a wetland unit (Commercial, Transportation, Manufacturing, In Transition, Agriculture, Residential, Golf Course, Storage & Transportation, Landfill).

Entity Type Label

Agri_type

Entity Type Definition:

Specific agricultural anthropogenic cause attributed to loss within a wetland unit (forage/grain crop, farm structure, cranberries, row crops, row/forage/grain).

Entity Type Label

Description

Entity Type Definition:

Description of the anthropogenic causes attributed to loss within a wetland unit

tbl_Loss09 (a list of all wetland units and polygon numbers with detailed information on the amount of loss in hectares, by percent, and by cause between 1999 and 2009)

Entity Type Label

Unit_no

Entity Type Definition:

Unique to each wetland unit. One unit can have more than one polygon.

Entity Type Label

Poly_no

Entity Type Definition:

Individual polygon number within a wetland unit. One unit can have more than one polygon.

Entity Type Label

Area_loss

Entity Type Definition:

Area in hectares lost to anthropogenic causes (urban and agriculture) by polygon number within a wetland unit.

Entity Type Label

Perc_loss

Entity Type Definition:

Percent of the wetland unit (not individual polygon) lost to anthropogenic causes (urban and agriculture).

Entity Type Label

Tot_loss_h

Entity Type Definition:

Total area in hectares of the wetland unit (not individual polygon) lost to anthropogenic causes (urban and agriculture).

Entity Type Label

Loss_class

Entity Type Definition:

Proportion of a wetland unit (not individual polygon) lost to anthropogenic causes (urban and agriculture) expressed in a percent class (0-5%, 5-15%, 15-30%,30-50%, 50-100%).

Entity Type Label

Type_encro

Entity Type Definition:

Anthropogenic cause attributed to loss within a wetland unit (Commercial, Transportation, Manufacturing, In Transition, Agriculture, Residential, Industrial, Golf Course, Storage & Transportation, Landfill).

Entity Type Label

Agri_type

Entity Type Definition:

Specific agricultural anthropogenic cause attributed to loss within a wetland unit (farm structure, cranberries, row crops, forage, row crops, grain crops, turf, berry crop.).

Entity Type Label

Description

Entity Type Definition:

Description of the anthropogenic causes attributed to loss within a wetland unit

tbl_CWS_Eelgrass (a list of eelgrass polygons from a 1993 eelgrass mapping project and the Wetland unit and polygon they fall within, area in hectares, and a note that this includes only eelgrass greater than 50% density.)

Entity Type Label

Unit_no

Entity Type Definition:

Unique to each wetland unit. One unit can have more than one polygon.

Entity Type Label

Poly_no

Entity Type Definition:

Individual polygon number within a wetland unit. One unit can have more than one polygon.

Entity Type Label

Source

Entity Type Definition:

Source is a 1993 eelgrass mapping project by Michael Dunn of the Canadian Wildlife Service consisting of transects and plots as well as a dive survey for subtidal eelgrass beds. The original survey included *Zostera japonica* and *Zostera marina* but they have been combined here.

Entity Type Label

Area_ha

Entity Type Definition:

Area of each eelgrass polygon in hectares.

Entity Type Label

VegCover

Entity Type Definition:

This note emphasizes that only those eelgrass beds with greater than 50% density of either *Zostera japonica* or *Zostera marina*.

Wetlands_Dissolve (feature class) (existing wetland units, includes info about the location, loss status and size of the wetlands)

Entity Type Label

Unit_no

Entity Type Definition:

Unique to each wetland unit. One unit can have more than one polygon.

Entity Type Label

Name

Entity Type Definition:

Wetland unit name based on geographic location .

Entity Type Label

Location

Entity Type Definition:

Wetland unit name based on a specific geographic location..

Entity Type Label

Geo_Region

Entity Type Definition:

Generalized location of wetland unit – broad area.

Entity Type Label

Municipal1

Entity Type Definition:

Full name of the municipality in the Greater Vancouver Regional District (MetroVancouver) and the Fraser Valley Regional District that the largest portion of the wetland unit is within.

Entity Type Label

Size_mun1

Entity Type Definition:

Size in hectares of the municipality in the Greater Vancouver Regional District (MetroVancouver) and the Fraser Valley Regional District that the largest portion of the wetland unit is within.

Entity Type Label

Municipal2

Entity Type Definition:

Full name of the municipality in the Greater Vancouver Regional District (MetroVancouver) and the Fraser Valley Regional District that the second largest portion of the wetland unit is within.

Entity Type Label

Size_mun2

Entity Type Definition:

Size in hectares of the municipality in the Greater Vancouver Regional District (MetroVancouver) and the Fraser Valley Regional District that the second largest portion of the wetland unit is within.

Entity Type Label

Regdist1

Entity Type Definition:

Name of the regional district (Greater Vancouver Regional District (MetroVancouver) or the Fraser Valley Regional District) that the largest portion of the wetland unit is within

Entity Type Label

Regdist2

Entity Type Definition:

Name of the regional district (Greater Vancouver Regional District (MetroVancouver) or the Fraser Valley Regional District) that the second largest portion of the wetland unit is within

Entity Type Label

Source

Entity Type Definition:

There are four sources for each wetland unit – “CWS-2000” which are wetland units that were assessed for loss in 1989-99 and 99-2009, “FREMP-2000” which are wetland units that were part

of FREMP and not assessed for loss at any time, “CWS/FREMP-2000” which are wetlands where part of it is in the FREMP area and part is outside, only the portion outside of FREMP was assessed for loss, and “CWS-2002” which involve three new wetland units (four polygons) added in 2002 where a wetland was restored or enhanced.

Entity Type Label

WetlandArea

Entity Type Definition:

Total area in hectares of the wetland unit (not individual polygon) as calculated from the GIS after the 2009 wetland loss study (excludes lost polygons).

Entity Type Label

GIS99_TOTS

Entity Type Definition:

Total area in hectares of the wetland unit (not individual polygon) as calculated from the GIS after the 1999 wetland loss study.

Entity Type Label

GIS89_TOTS

Entity Type Definition:

Total area in hectares of the wetland unit (not individual polygon) as re-calculated from the GIS using a vector version of the digital product from the original 1989 survey. The re-calculated sizes vary a minor amount from the old “Old_TotSize” as they are calculated using a different method. It was decided to produce a GIS size from the vector version in order to be able to calculate any changes in the wetland size in the future.

Entity Type Label

Old_TotSize

Entity Type Definition:

Total area in hectares of the wetland unit (not individual polygon) as calculated from the original raster digital product in the original 1989 survey.

Wetlands (feature class) (all wetland polygons that have made up a wetland unit since 1989, existing and lost. A single wetland unit can consist of many polygons. Includes info about the location, loss status and size of the wetlands.)

Entity Type Label

Unit_no

Entity Type Definition:

Unique to each wetland unit. One unit can have more than one polygon.

Entity Type Label

Poly_no

Entity Type Definition:

Individual polygon number within a wetland unit. One unit can have more than one polygon.

Entity Type Label

Name

Entity Type Definition:

Wetland unit name based on geographic location .

Entity Type Label

Location

Entity Type Definition:

Wetland unit name based on a specific geographic location..

Entity Type Label

Geo_Region

Entity Type Definition:

Generalized location of wetland unit – broad area.

Entity Type Label

Municipal1

Entity Type Definition:

Full name of the municipality in the Greater Vancouver Regional District (MetroVancouver) and the Fraser Valley Regional District that the largest portion of the wetland unit is within.

Entity Type Label

Size_mun1

Entity Type Definition:

Size in hectares of the municipality in the Greater Vancouver Regional District (MetroVancouver) and the Fraser Valley Regional District that the largest portion of the wetland unit is within.

Entity Type Label

Municipal2

Entity Type Definition:

Full name of the municipality in the Greater Vancouver Regional District (MetroVancouver) and the Fraser Valley Regional District that the second largest portion of the wetland unit is within.

Entity Type Label

Size_mun2

Entity Type Definition:

Size in hectares of the municipality in the Greater Vancouver Regional District (MetroVancouver) and the Fraser Valley Regional District that the second largest portion of the wetland unit is within.

Entity Type Label

Regdist1

Entity Type Definition:

Name of the regional district (Greater Vancouver Regional District (MetroVancouver) or the Fraser Valley Regional District) that the largest portion of the wetland unit is within

Entity Type Label

Regdist2

Entity Type Definition:

Name of the regional district (Greater Vancouver Regional District (MetroVancouver) or the Fraser Valley Regional District) that the second largest portion of the wetland unit is within

Entity Type Label

Status

Entity Type Definition:

Describing the condition of the wetland unit as lost between 89-99, 99-09, not assessed (as in FREMP area) or no loss.

Entity Type Label

Source

Entity Type Definition:

There are four sources for each wetland unit – “CWS-2000” which are wetland units that were assessed for loss in 1989-99 and 99-2009, “FREMP-2000” which are wetland units that were part of FREMP and not assessed for loss at any time, “CWS/FREMP-2000” which are wetlands where part of it is in the FREMP area and part is outside, only the portion outside of FREMP was assessed for loss, and “CWS-2002” which involve three new wetland units (four polygons) added in 2002 where a wetland was restored or enhanced.

Entity Type Label

SurveyDate

Entity Type Definition:

Date of original field checking for the original 1989 wetland unit mapping.

Entity Type Label

Airphoto

Entity Type Definition:

Identification number of the original applicable airphoto used in the original 1989 wetland unit mapping.

Entity Type Label

WetlandArea

Entity Type Definition:

Total area in hectares of the wetland unit (not individual polygon) as calculated from the GIS after the 2009 wetland loss study (excludes lost polygons).

Entity Type Label

GIS99_TOTS

Entity Type Definition:

Total area in hectares of the wetland unit (not individual polygon) as calculated from the GIS after the 1999 wetland loss study.

Entity Type Label

GIS89_TOTS

Entity Type Definition:

Total area in hectares of the wetland unit (not individual polygon) as re-calculated from the GIS using a vector version of the digital product from the original 1989 survey. The re-calculated sizes vary a minor amount from the old “Old_TotSize” as they are calculated using a different method. It was decided to produce a GIS size from the vector version in order to be able to calculate any changes in the wetland size in the future.

Entity Type Label

Old_TotSize

Entity Type Definition:

Total area in hectares of the wetland unit (not individual polygon) as calculated from the original raster digital product in the original 1989 survey.

Study Areas (feature class) (footprint of the study area in which wetlands were inventoried and assessed. Note: wetlands in the FREMP area were not assessed. Use “status” in Wetlands feature class to delineate those polygons that were assessed for change, and those that were not.)

Entity Type Label

Shape

Entity Type Definition:

Polygon of the study area.

MDunn-eelgrass_above50percent (feature class) (a list of eelgrass polygons from a 1993 eelgrass mapping project and the Wetland unit and polygon they fall within, area in hectares, and a note that this includes only eelgrass greater than 50% density.)

Entity Type Label

Unit_no

Entity Type Definition:

Unique to each wetland unit. One unit can have more than one polygon.

Entity Type Label

Poly_no

Entity Type Definition:

Individual polygon number within a wetland unit. One unit can have more than one polygon.

Entity Type Label

Source

Entity Type Definition:

Source is a 1993 eelgrass mapping project by Michael Dunn of the Canadian Wildlife Service consisting of transects and plots as well as a dive survey for subtidal eelgrass beds. The original survey included *Zostera japonica* and *Zostera marina* but they have been combined here.

Entity Type Label

Area_ha

Entity Type Definition:

Area of each eelgrass polygon in hectares.

Entity Type Label

VegCover

Entity Type Definition:

This note emphasizes that only those eelgrass beds with greater than 50% density of either *Zostera japonica* or *Zostera marina*.

6 Distribution Information

THIS DATASET IS SUBJECT TO THE TERMS AND CONDITIONS OF A DATA LICENCE AGREEMENT.

6.1 Distributor

10.2 Contact Organization Primary

10.1.2 Contact Organization:

Environment Canada, Canadian Wildlife Service

10.1.1 Contact Person:

Kathleen Moore

10.4 Contact Address

10.4.1 Address Type:

Mailing Address

10.4.2 Address:

RR 1, 5421 Robertson Road

10.4.3 City:

Delta

| | |
|-------------------------------------|--|
| 10.4.4 State or Province: | B.C. |
| 10.4.5 Postal Code: | V4K 3N2 |
| 10.4.6 Country: | Canada |
| 6.4 Standard Order Process | |
| 6.4.2 Digital Form | |
| 6.4.2.1.1 Format Name: | ARCGIS Geodatabase |
| 6.4.2.2 Digital Transfer Option | |
| 7 Metadata Reference Information | |
| 7.1 Metadata Date: | 980224 |
| 7.2 Metadata Review Date: | 20020410 |
| 7.2 Metadata Review Date: | 20030501 |
| 7.2 Metadata Review Date: | 20120123 |
| 7.4 Metadata Contact: | |
| 10.2 Contact Organization Primary | |
| 10.1.2 Contact Organization: | Environment Canada, Canadian Wildlife Service |
| 10.1.1 Contact Person: | Kathleen Moore |
| 10.4 Contact Address | |
| 10.4.1 Address Type: | Mailing Address |
| 10.4.2 Address: | RR 1, 5421 Robertson Road |
| 10.4.3 City: | Delta |
| 10.4.4 State or Province: | B.C. |
| 10.4.5 Postal Code: | V4K 3N2 |
| 10.4.6 Country: | Canada |
| 7.5 Metadata Standard Name: | NBS Content Standards for National Biological |
| Information Infrastructure Metadata | |
| 7.6 Metadata Standard Version: | NBII Draft of December 1995, Based FGDC of June 8, |
| 1994 | |
| 7.8 Metadata Access Constraints: | |
| TBA | |
| 7.9 Metadata Use Constraints: | |
| TBA | |