
INVASIVE ALIEN PLANT PROGRAM

GIS Data Capture Specifications

Prepared by Ministry of Forests
 Forest Practices Branch
 Range And Integrated Resources Section

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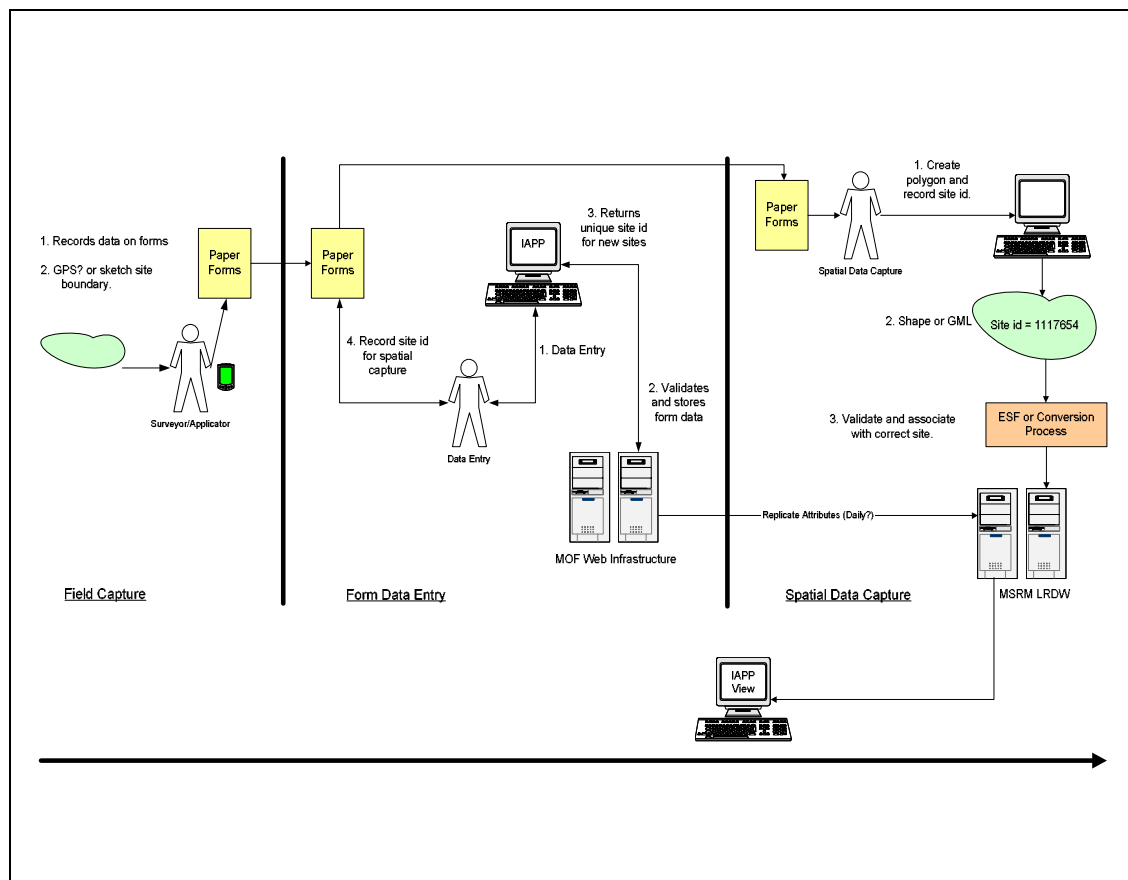
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1. INTRODUCTION

The purpose of this document is to define the data format specifications for compilation of spatial data for the Invasive Alien Plant Program. It does not define the field data capture process but merely the format and structure of the data that is required to upload to the Ministry of Forests database. The required format is simple and assumes that the unique identifiers from the site are known and have been provided to the ¹compilation organization. Meta-data specifying how the data was captured is the only other attributes required for population. Spatial data compilation may be required for either of the following features.

1. IAPP Site (Polygon)
2. Treatment Area (Polygon)

The document also assumes that the following work flow is adopted to ensure the compilation company has all the information they need to meet these requirements.



¹ A compilation organization could be a contractor, a government agency or anyone else assigned the task of preparing GIS files for submission to the Ministry of Forests Invasive Alien Plant Program.

2. DATA CAPTURE SOURCE

It is assumed that the field data capture will be done by one of two methods:

Differential GPS according to BC Government standards or via a sketch map tied to (drawn on) a TRIM map sheet. For more information on GPS standards for Resource Mapping Surveys in British Columbia please refer to the MSRM web site location:

http://srmwww.gov.bc.ca/bmgs/gsr/gsr_standards.htm#trafford

With that said, the compilation organization should receive either a GPS file or a ²sketch map tied to a TRIM 1:20,000 map sheet for each feature that needs to be digitized. The submission must specify which method was used for data capture.

2.1 GPS DATA CAPTURE

GPS is the preferred field capture method.

Any Invasive Alien Plant Sites that have been located via a GPS should be directly loaded into a GIS or CAD package. If sites are first plotted onto hard copy maps and then digitized, an unnecessary margin of error will be introduced to the sites location.

2.2 TRIM (SKETCH MAP)

When a feature on a TRIM map defines an IAPP Feature, the IAPP Feature should be constructed digitally by copying the intended TRIM feature from the digital base map. It should not be digitized directly from the hard copy map. Any features that are defined by a linear feature from TRIM (e.g. stream, road) should be copied and buffered to the appropriate distance to create the IAPP feature.

Note: In cases where the TRIM data is obviously incorrect a decision can be made to digitize the site directly. This should be the exception, not the rule.

² A sketch map refers to taking a paper map with TRIM or other similar features into the field and drawing the site on the map. This would be later digitized.

3. DATA CAPTURE STANDARDS

This section details the projection and precision that is required for data submission.

3.1 BRITISH COLUMBIA ALBERS STANDARD PROJECTION

All data must be submitted using the BC Albers projection.

The projection is Albers Equal Area Conic, with parameters of:

- Central meridian: -126.0 (126:00:00 West longitude)
- Latitude of projection origin: 45.0 (45:00:00 North latitude)
- First standard parallel: 50.0 (50:00:00 North latitude)
- Second standard parallel: 58.5 (58:30:00 North latitude)
- False easting: 1000000.0 (one million metres)
- False northing: 0.0

The datum is NAD83, based on the GRS80 ellipsoid. For more information please refer to the MSRM web site location:

<http://srmwww.gov.bc.ca/gis/bceprojection.html>

3.2 DATA PRECISION

Data collection tools will often capture more precision than useful or required. For example, 27865.4768236749 meters is more precise than the data capture method. For the IAPP project all BC Albers coordinates must be rounded to the nearest meter. In the previous example the number would be 27865.0. This will help reduce erroneous data caused by noise (e.g. spikes, slivers) in the data.

The data will be rounded to a meter and validated during data load and data failing the validation will be rejected.

For more information on precision and related topics see the MSRM web site locations:

<http://srmwww.gov.bc.ca/gis/storageprecision.html>

<http://srmwww.gov.bc.ca/gis/gisscale.html>

3.3 TOPOLOGY

All data will be submitted as closed polygons. Any linear features will be buffered as per the information supplied by the contract administrator. For example, a road might contain weeds only on the left hand side of the road (based on field notes) therefore a buffer should only be applied to the left side of the road.

Correct polygon topology must be used including:

1. Explicit closing of polygons at mathematically exact coordinates. (i.e. the first and last point must be identical).
2. Spikes and sliver polygon removal must be performed.
3. Polygon holes and islands are acceptable but must be created according to ESRI Shape file specifications.

4. SUBMISSION FORMAT

The spatial data submission must be created in an ESRI Shape File due to the limited number of vendors creating and submitting spatial data for this program. If the program expands a vendor neutral format such as GML will be instituted. Each submission can contain one or more IAPP features.

4.1 ESRI SHAPE FILES

A definition of the ESRI Shape File and associated dbf for each IAPP feature type follows. There is no specific naming convention required but it makes sense to logically name the files to represent the content. (e.g. contract # or site_id).

Regardless of the feature type each shape will be submitted using polygon topology. Point and linear data types will not be accepted. A sample shape file can be requested from the Ministry of Forests contract administrator.

4.1.1 DBF FILE FOR A SITE POLYGON

| Column | Type | Length | Precision | Comment |
|----------|--------|--------|-----------|---|
| SITE_ID | LONG | 9 | 9 | The site id of the feature. This should come from the project coordinator. |
| SOURCE | SHORT | 4 | 4 | 0 if it is unknown, 1 if it is GPS or 2 if it was TRIM. The method should be supplied so 0 should not be the common case. Contact your contract administrator if you do not receive this information. |
| METHOD | SHORT | 4 | 4 | If the source is 1 then this value must be 1 representing differential GPS. If the source is 2 then this value must be 2 if the source was a sketch map or 3 if the source was tablet digitizing. Most often this value should be 3 as the TRIM source data should be copied not approximated. If the source is 0 (Unknown) then the method should also be 0. |
| OBS_DATE | Date | 8 | | The date the field observation was made. |
| DQ_COMM | STRING | 250 | | Any applicable comments regarding the data quality of the feature. (e.g. accuracy concerns etc.) |

A screen shot from ArcMap 9.0 is provided for more clarity.

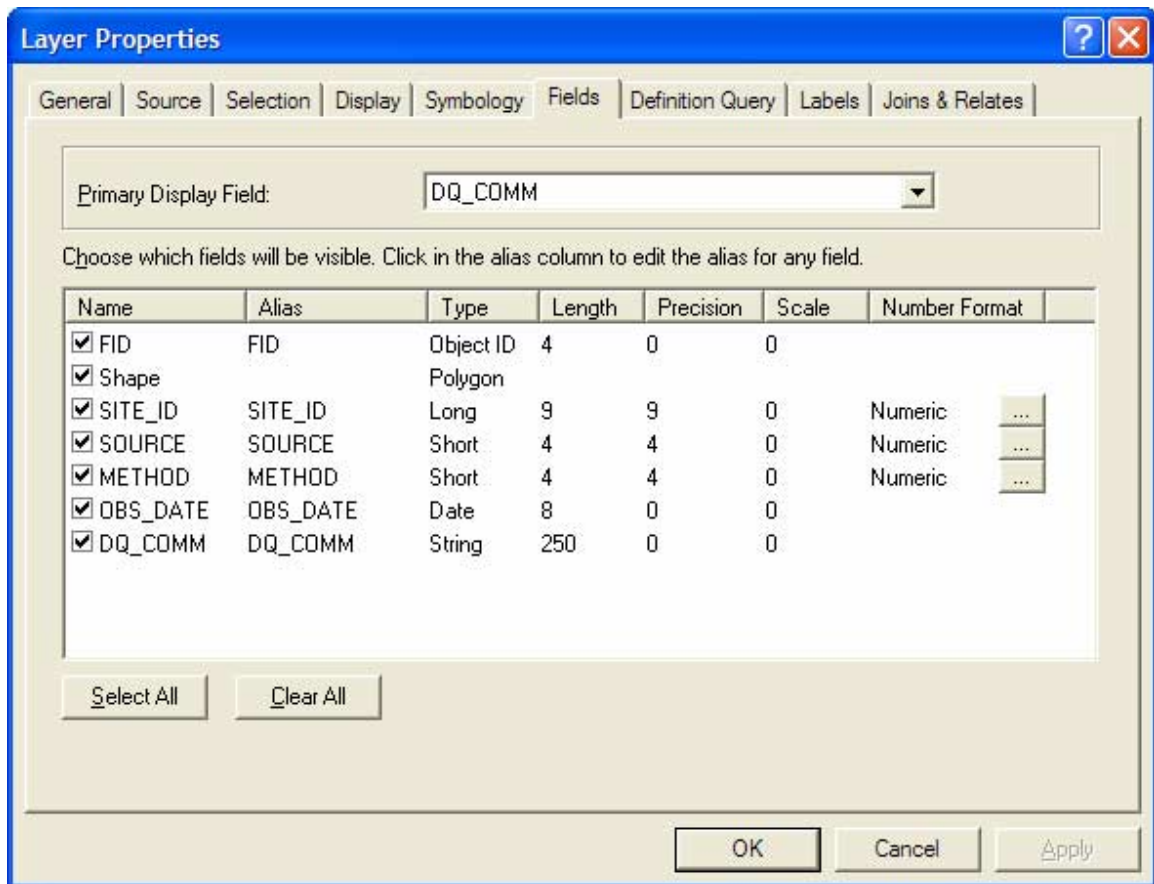


Figure 1 - Layout for Site Attributes

4.1.2 DBF FILE FOR A TREATMENT POLYGON

| Column | Type | Length | Precision | Comment |
|----------|--------|--------|-----------|---|
| TREAT_ID | LONG | 9 | 9 | The treatment id of the feature. This should come from the project coordinator. |
| SOURCE | SHORT | 4 | 4 | 0 if it is unknown, 1 if it is GPS or 2 if it was TRIM. The method should be supplied so 0 should not be the common case. Contact your contract administrator if you do not receive this information. |
| METHOD | SHORT | 4 | 4 | If the source is 1 then this value must be 1 representing differential GPS. If the source is 2 then this value must be 2 if the source was a sketch map or 3 if the source was tablet digitizing. Most often this value should be 3 as the TRIM source data should be copied not approximated. If the source is 0 (Unknown) then the method should also be 0. |
| OBS_DATE | Date | 8 | | The date the field observation was made. |
| DQ_COMM | STRING | 250 | | Any applicable comments regarding the data quality of the feature. (e.g. accuracy concerns etc.) |

A screen shot from ArcMap 9.0 is provided for more clarity.

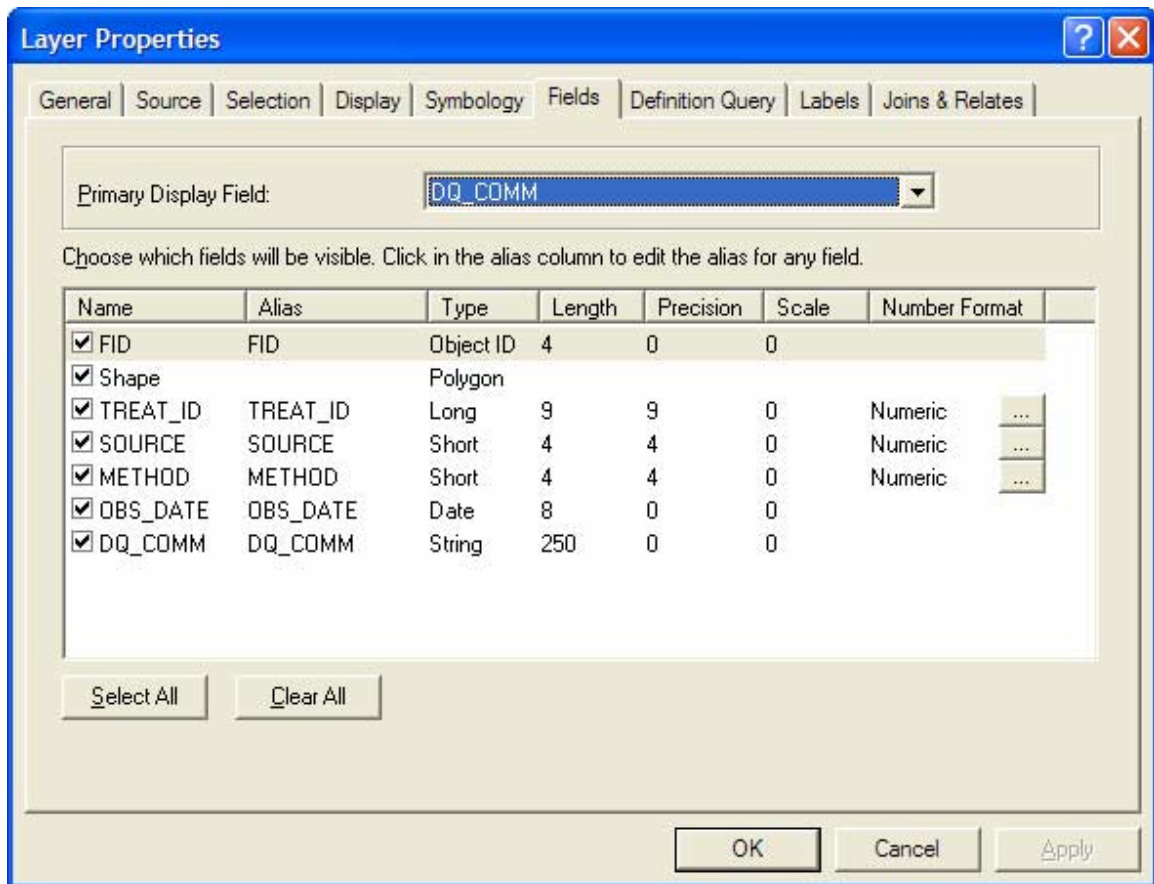


Figure 2 - Layout for Treatment Attributes

5. SAMPLE FILES

You can obtain sample ESRI Shape files from the Ministry of Forests, Invasive Plant Program web-site at www.for.gov.bc.ca/hfp/invasive/intro.htm. Follow the link to Sample GIS Submission files and download the zip file. The zip file contains the following files. Using these, as apposed to creating a shape file according to the standard is a much faster way to get up an running.

The sample files include:

| | |
|---------------|---|
| IAPP_SITE.prj | The projection file defining BC Albers. |
| IAPP_SITE.shp | A shape file containing a sample site. |
| IAPP_SITE.sbx | The shape files associated index file. |
| IAPP_SITE.shx | The shape files associated index file. |
| IAPP_SITE.sbn | The shape files associated index file. |
| IAPP_SITE.dbf | The shape files associated dbf containing the sites attributes. |

| | |
|--------------------|--|
| IAPP_TREATMENT.prj | The projection file defining BC Albers. |
| IAPP_TREATMENT.shp | A shape file containing a sample treatment. |
| IAPP_TREATMENT.sbx | The shape files associated index file. |
| IAPP_TREATMENT.shx | The shape files associated index file. |
| IAPP_TREATMENT.sbn | The shape files associated index file. |
| IAPP_TREATMENT.dbf | The shape files associated dbf file containing the treatment attributes. |