InvasivesBC Reference Guide

Invasive Plant Program
Ministry of Forests
Province of BC

InvasivesBC@gov.bc.ca

Version 2: June 2023

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1.0 Introduction

1.1 What is InvasivesBC?

InvasivesBC is British Columbia's new centralized invasive species database application that was launched by the Ministry of Forests in 2023. The InvasivesBC database, map and mobile data collection application is available for use by all land managers, contractors, government agencies and non-profit organizations completing surveys and/or management actions on invasive species in B.C.

InvasivesBC replaces the previous provincial mapping and database application called the Invasive Alien Plant Program (IAPP), which supported invasive plant management in BC from 2005-2023. The complete dataset from IAPP is viewable and extractable via InvasivesBC, but edits to the IAPP records are not permitted.

The Province is committed to maintaining a shared invasive species map and database to support a centralized location for information that can be used by a large and diverse user community on an ongoing basis. Having a single shared location for invasive species occurrence and management data helps to deliver more collaborative and effective invasive species management programs throughout B.C.

1.2 Why was this guide developed?

This Reference Guide was developed to support users of InvasivesBC with understanding data entry, viewing, searching, and reporting/extracting functions available in the InvasivesBC application. InvasivesBC will continue to have additional features and functionality added over time through ongoing releases of updated versions and this manual will be kept up to date as those additional features go live.

1.3 Who is this guide for?

This Reference Guide is intended for agencies, organizations and individuals who are interested in, and participate in, invasive species management in BC.

It is important to note that the Reference Guide will be targeted to new program users but will also be a useful "on-the-job" resource to all individuals managing invasive species.

NOTE: InvasivesBC version 1 launched in 2023 will be for invasive plant occurrence and management actions only. Invasive animal forms and associated functionality will be added at a later date and this Reference Guide will be updated with invasive animal information at that time.

2.0 How to access InvasivesBC

Access to the data in InvasivesBC is password-restricted to authorized users and requires B.C. Public Service staff IDIR or a Business BCeID. Access will only be provided to users who are working on invasive species management in BC or have another valid reason to use the application.

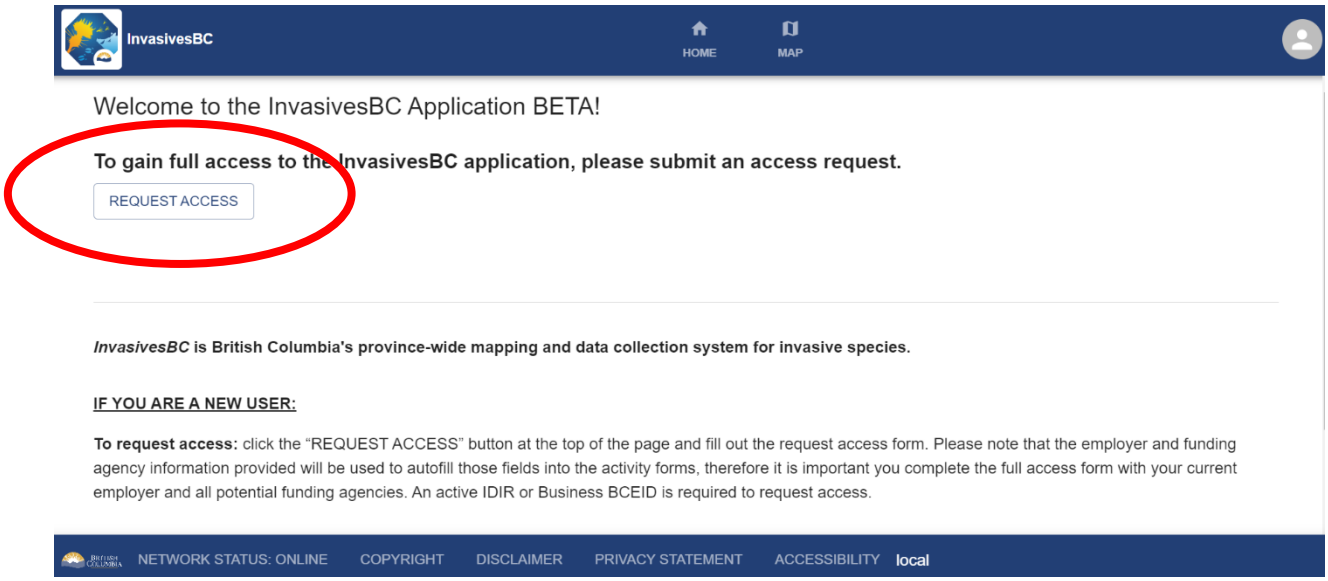
Please note that the Business Accounts and/or Profile Manager (BAM) for the company needs to set the Business Preference for each user and should select "Share my business details with any e-Service in government" in the Information Sharing with Government e-Service section of their settings. They may contact the BCeID helpdesk for assistance at: 1-888-356-2741.

A public-facing map and dataset for invasive species occurrence data will be released at a future date.

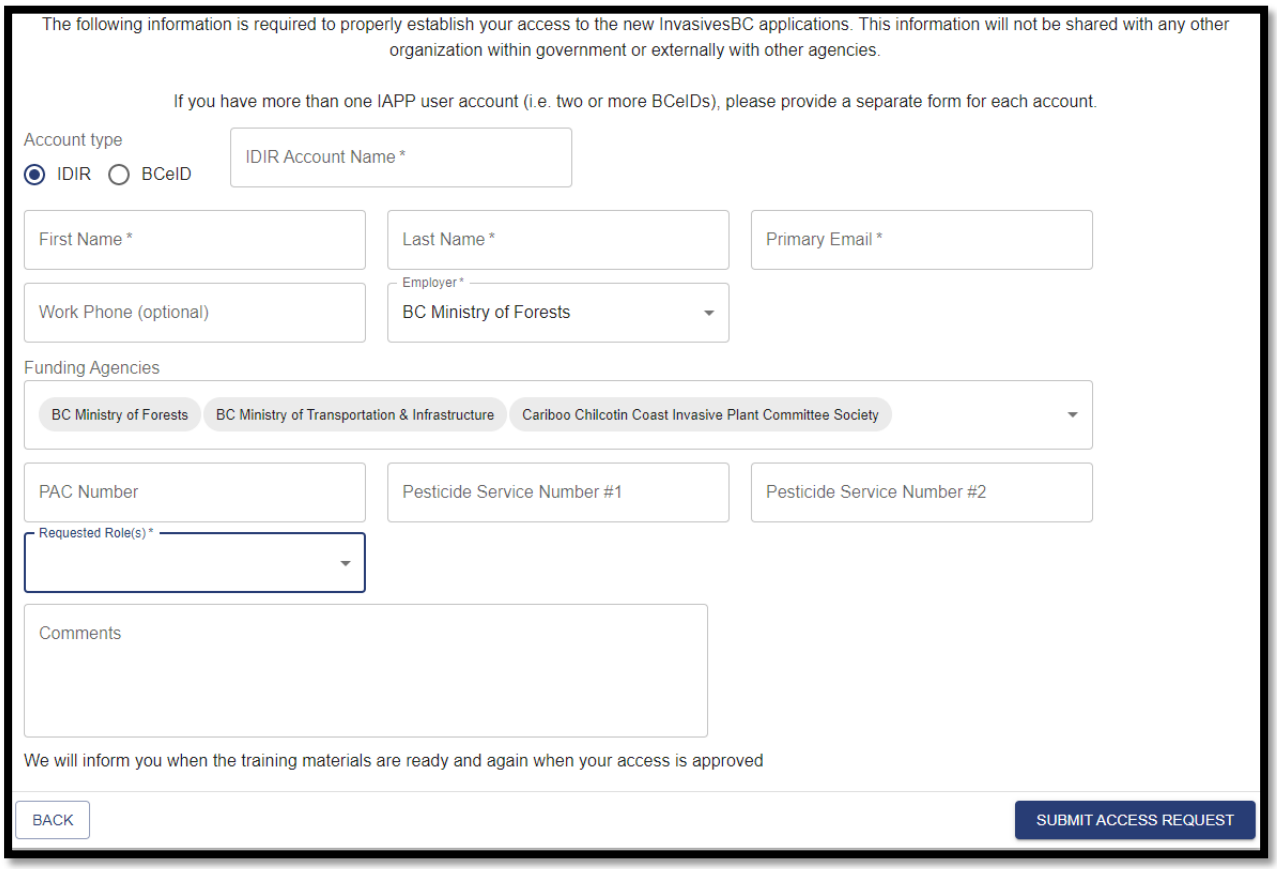
2.1 Requesting Access

To access to the database once you have an IDIR or BCeID:

1. Go to the InvasivesBC landing page (InvasivesBC.gov.bc.ca).
2. Click the “get access” button and fill out the required request for access form.
    - Note that some fields within the record form are auto-filled based on the information provided in your access request so it is important to ensure the request is accurate and complete. If the employer or funding agency required is not listed, please just choose another one and explain what the correct one should be in the comments field and it will be added.



3. Choose the role category from the dropdown.
    - Note that requested roles are reviewed carefully prior to approving access requests and administrator roles will only be provided to a small number of B.C. government staff managing InvasivesBC as each role type is associated with differing rules about editing and deleting records. Non-administrator role categories can edit and delete their own records, but can only view records entered by others.



4. Submitted access requests will be reviewed by the InvasivesBC team and approved within 3-5 business days.
    - You will be contacted if there are any questions about your access request, otherwise users should try to sign into InvasivesBC after 3-5 business days have passed to confirm your access has been approved.

5. Keep your account up to date with any changes to employer or funding agencies etc. by clicking on the person icon on the top right of the home page when you are logged in and selecting “Update my info”.
6. Questions about obtaining or updating access requests or the status of a current account can be submitted to InvasivesBC@gov.bc.ca.

2.2 What is a Funding Agency?

InvasivesBC is designed to coordinate and manage invasive plant data in B.C. This has been accomplished by assigning records (data) to individual funding agencies for improved tracking and sorting by funding agency. Funding agencies are often land managers hiring others to do work on their behalf, but may also be organizations providing grants or other funding agreements for invasive species management.

What if I work with more than one Funding Agency?

More than one Funding Agency can be chosen to allow for situations where the funds are initially provided by one Funding Agency, and then sub-contracted out to another company or group. In these situations both the original funder and the organization responsible for the funding should be chosen in the Funding Agency field (eg. Ministry of Transportation and Infrastructure, and Cariboo Regional District or Northwest Invasive Plant Council). If you work for more than one funding agency you can select multiple agencies when creating your access request. When creating records in InvasivesBC, you will be able to select the agency you are working under for each record.

Funding Agency vs Employer – Funding agency is the entity that has hired and is paying for the work being done. This may or may not be the same as the Employer. The employer is the organization or agency that the individual user works directly for – who pays their paycheck.

2.3 InvasivesBC Roles

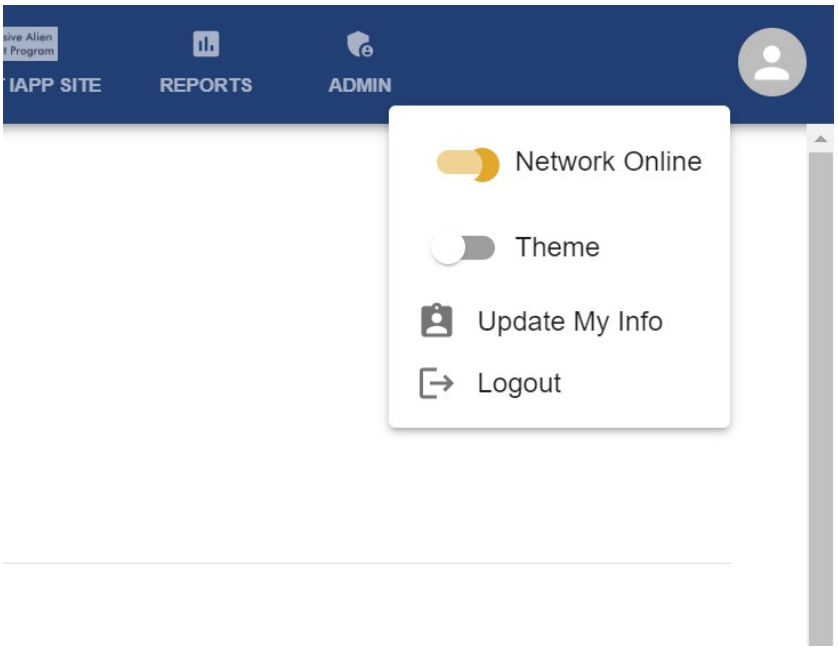
A user can request a role when making an access request that best describes their current position and affiliation. All InvasivesBC roles can view all submitted InvasivesBC records and legacy IAPP data and delete or edit their own records but only administrator rolls can delete or edit other people’s records. The InvasivesBC master administrators will confirm the appropriate role for all user requests before access is granted.

2.4 Access Expiry

By default, access requests are set to expire 1 year from when they were approved. If your access has expired, you can have it renewed by submitting a new access request. You can also have your access extended by submitting an “Update My Info” request at any time during the year.

2.5 Updating Access Account Information

To update your info, click the person icon in the top right and select “Update My Info”. Select any changes you would like to make to your account on the update form. If you simply want your access to be extended, leave your information as is and submit the update request.

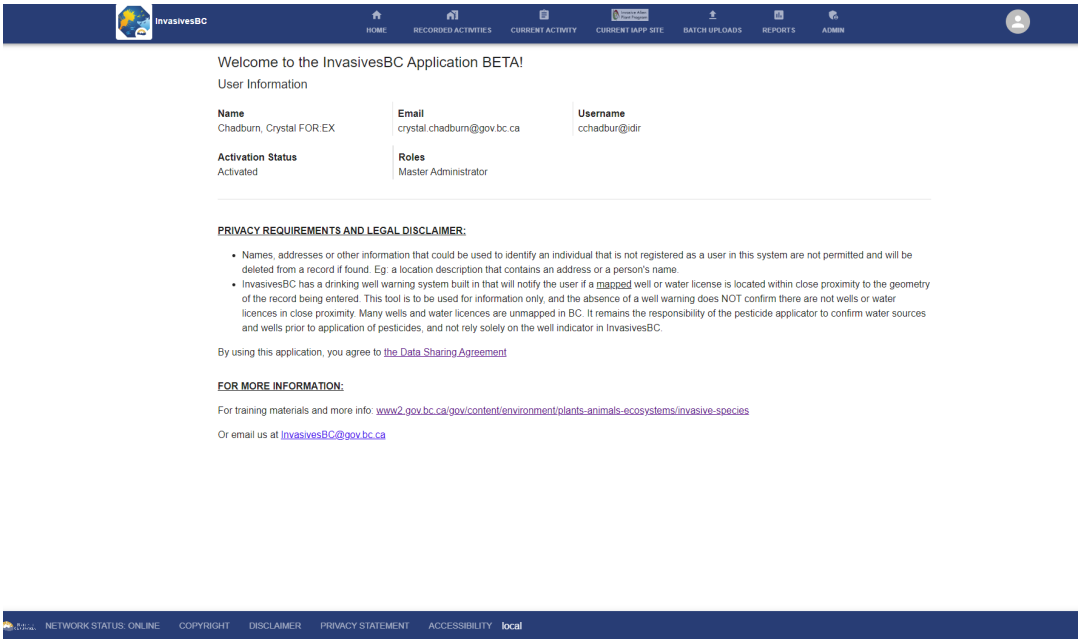


3.0 General Use of InvasivesBC

At this time, InvasivesBC is a web-based application that is best accessed via a Chrome browser. A mobile application with offline and online functionality is currently being developed to support direct data collection and entry in the field and will be released as soon as possible.

3.1 Navigating InvasivesBC

After logging into InvasivesBC, users will land on the home page where general information like the data sharing agreement and contact information can be found. All users should read the disclaimers and data sharing agreement prior to using the system.



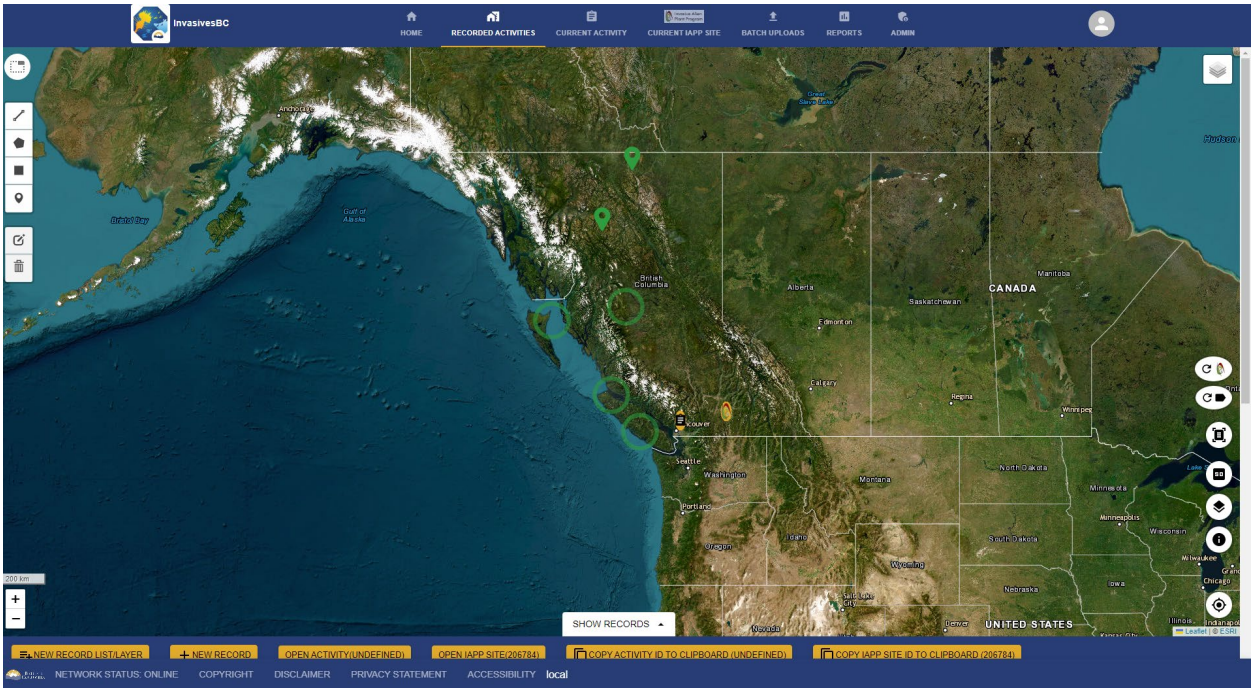
Across the top of the system (or down the side menu if using a mobile device) are the following tabs/pages:

1. Home
2. Recorded Activities – main page for viewing records and creating new records
3. Current Activity – opens when viewing selected InvasivesBC records and creating a new record.
4. Current IAPP Site – opens when viewing a selected IAPP record.
5. Batch Upload – Includes templates for batch uploading of multiple records at once as well as the batch upload portal and a list of all the user's batch files.
6. Reports – contains a list of IAPP extracts and InvasivesBC extracts and spatial reports to pull information out of InvasivesBC.
7. Admin (only visible to users with administrator access roles) – used to manage access requests.

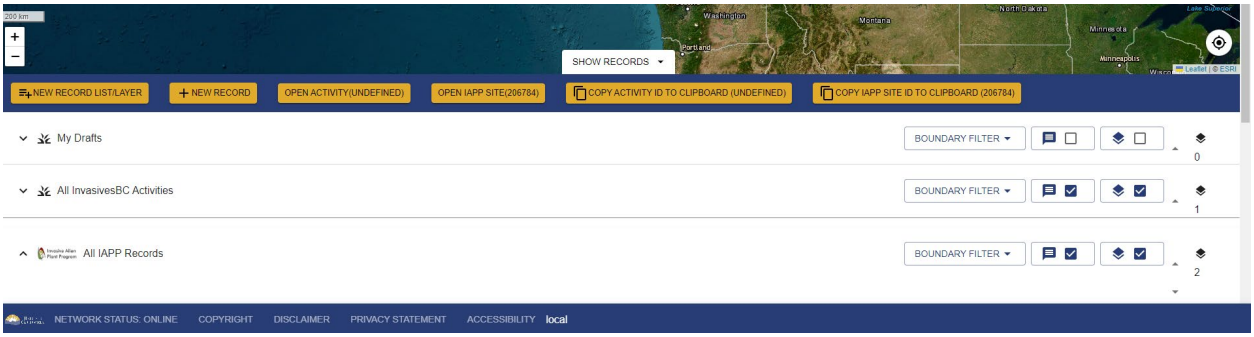
Additional information on the function and use of each of these tabs/pages is included in the relevant sections below.

3.2 Using the Map and Recorded Activities Page

The Recorded Activities page is the main page of InvasivesBC and the location of many functions related to filtering, viewing and creating new drafts and submitted InvasivesBC records as well as filtering and viewing IAPP records. This page has two sections, the map on the top and the tables on the bottom, that work together to allow users to customize the view on the map, search and filter record sets, upload kml/kmzs or draw boundaries to search within, and search for and view individual records.



There are 3 record set tables on the bottom half of the recorded activities page that appear when the white “show records” tab at the bottom of the map page is clicked: My Drafts, InvasivesBC activities and IAPP records.



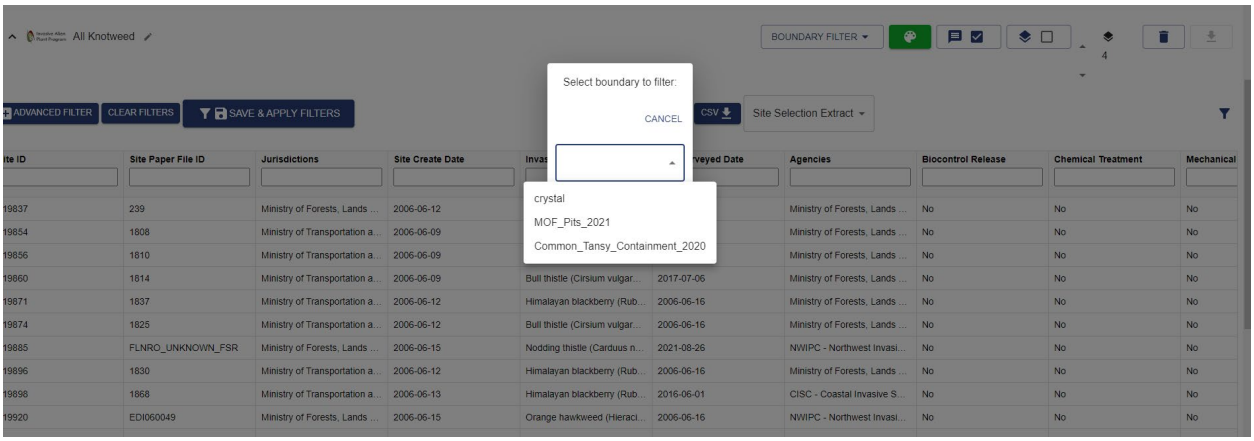
My Drafts
This table contains any saved, but un-submitted records that the current user has created. Note that these records are not viewable by any other user in InvasivesBC. Only submitted records can be seen by all users. Draft records can be opened one at a time from this table and then either finalized and submitted or deleted.

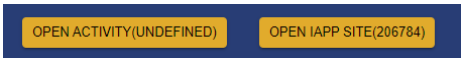
InvasivesBC activities
This table contains all submitted records created in InvasivesBC, by all users. Records can be opened and viewed from this table, but only the user that created the record, or the Administrators can edit or delete the records. InvasivesBC records selected in the table are viewable by opening them in the Current Activity tab of InvasivesBC by clicking the orange “open activity” button at the top of the tables or by navigating directly to the Current Activity page.

IAPP Records
This table contains the full data set from the previous provincial invasive plant database - the *Invasive Alien Plant Program* (IAPP), including all photos attached to IAPP records. IAPP records selected in the table are viewable by opening them in the IAPP tab of InvasivesBC by clicking the orange “open IAPP site” button at the top of the tables or by navigating directly to the Current IAPP site page.

The following functions can be performed for all 3 dataset tables on the Recorded Activities page:

A) Searching and filtering the tables by fields included in the columns of the tables using the funnel filter icon on the far right of each table and/or by an area on the map (through uploading a kml/kmz or drawing a boundary on the map and then choose the “Boundary filter” drop down beside the colour picker to select your boundary for that data set”.



B) Opening a record from any of the tables (datasets). 

C) Creating multiple custom data sets that can be filtered and displayed separately or together on the map using the  button and then selecting either an InvasivesBC or IAPP dataset.

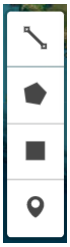
D) Displaying the datasets (with or without filters) on the map including (from left to right in the image below), choosing a colour from the colour picker, turning the labels on/off on the map, turning the points/polygons on/off on the map, choosing the order the layers are drawn on the map, and deleting a custom dataset (not the three main tables cannot be deleted). When a custom dataset is deleted, the records are not deleted from InvasivesBC and are still viewable in the main InvasivesBC and IAPP datasets.

E) Creating a new record using the  button.

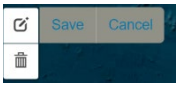
3.3 Icons on the InvasivesBC map

This section lists the icons shown on the map of the Recorded Activities page and outlines the general functionality of each.

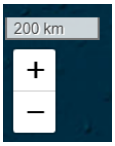
KML/KMZ uploader tool used to create boundaries that can then be used to filter record tables and view on the map. To upload the kml or kmz, click the icon and choose ‘add kml’ followed by upload kml/kmz. You can drag and drop a file to the box or select the arrow to find one in your library. Uploaded KML/KMZ will only be viewable by the user that uploaded them. Click this icon again to see a list of currently uploaded KML/KMZs and delete them using the trash icon. Click the X to close the KML/KMZ uploader window.



Drawing Tools used to create a user defined boundary that can then be used to filer record tables and view on the map. In order from top to bottom, the buttons are used to draw a line, polygon, square or point. After drawing the shape, a prompt will appear asking you to save a name for that boundary. Click the KML/KMZ uploader icon above to delete any shapes created. User defined/drawn shapes are only viewable to the user that created them.



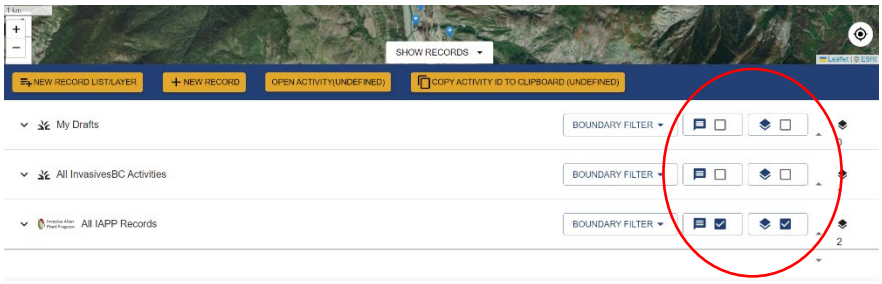
Edit and Delete icons for making changes to the user defined boundaries created with the drawing tools above. Click the top edit button and the boundary drawn will be highlighted with vertices that can be dragged. Then click either save or cancel to either finalize or remove the changes made to that boundary. Click the trash can icon to remove the last boundary drawn. Saved boundaries must be deleted using the trash can icon within the kml/kmz uploader window.



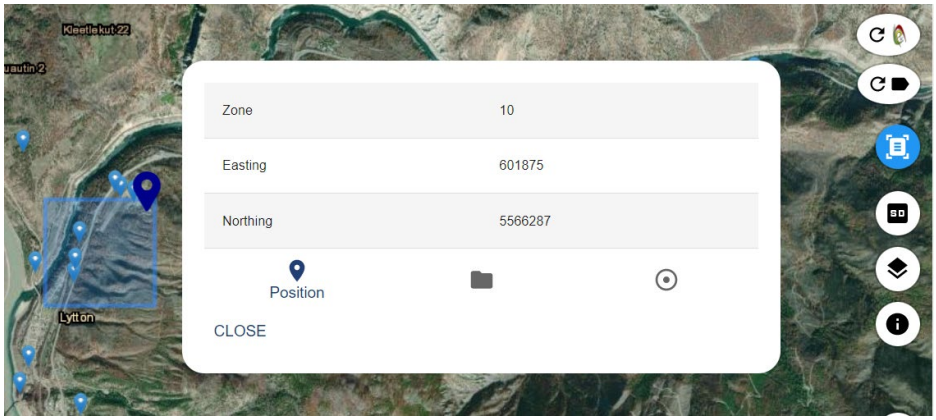
Zoom in/zoom out icons and scale bar. Click the + or – buttons to zoom in and out or use your mouse wheel. On a mobile device, zooming and navigating the map can be accomplished using the tough screen. One turn of the mouse wheel gives large increments in zoom changes, therefore it is recommended that users click on the +/- zoom icons for smaller increments or to fine tune your zoom.

The layer picker used to turn commonly used layers on and off for viewing on the map. All layers come from BC Geographic data warehouse source except for the Regional Invasive Species Organization layer. Each layer has its own symbology depending on where they were created. These layers are only viewable on certain zoom settings. If they are not visible, zoom in and the layers and their labels should appear. The source layer names are included in the legend (see below). If a layer is not shown, users can upload their own kml/kmz using the kml/kmz uploader tool at the top left of the map.

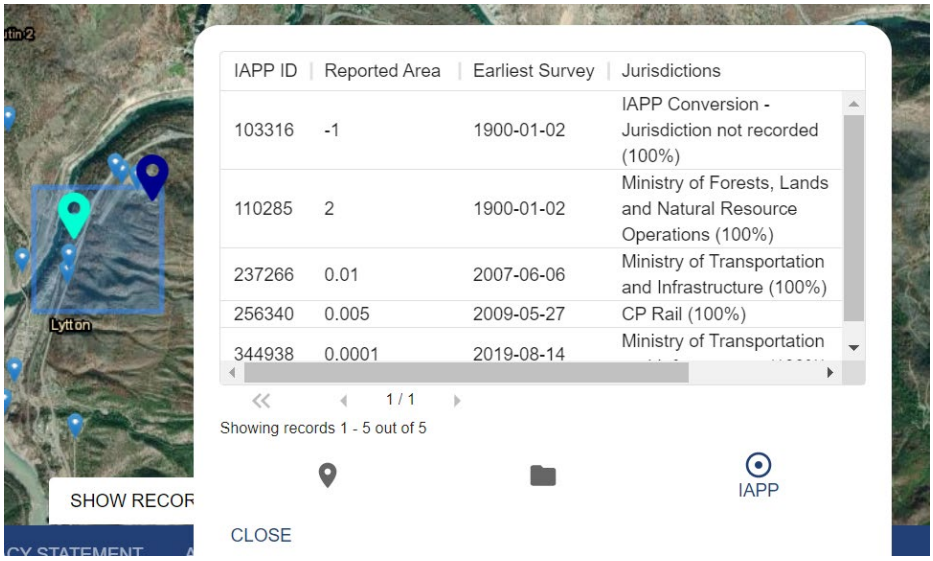
Refresh icon and label icons. The top button is used to refresh/load the IAPP site dots on the map once a user has zoomed to the desirable extent. The IAPP sites must be “turned on” in the IAPP table on the bottom half of the Recorded Activities page for this button to work. The bottom button is used to refresh labels within the map extent. This feature is needed as the labels clutter the map if they all turn on at once. Only labels for data sets with the label indicator box checked on the Recorded Activities page will show up when this button is clicked.



This “What’s Here” button is used to select IAPP and/or InvasivesBC record(s) on the map to see more information about those records or to find out the UTM at the position. A pop up box will appear after one or more records are selected showing the options below.



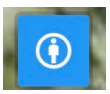
Switch between the “position” tab, the InvasivesBC tab (folder icon in the middle) and the IAPP record tab (point of interest icon) to see the UTMs, any InvasivesBC records and any IAPP records, respectively. Hovering over the ID column will highlight the record on the map, and clicking the record will open the record to review the complete record. Clicking the headings of the What’s Here window will sort the records by that column as well.



SD/HD toggle. The imagery layer is a mosaic of ESRI. There is different imagery resolution data in different areas of British Columbia so InvasivesBC uses the SD/HD function to enable the best resolution possible when zooming way into an area to view or create a new record. If the map appears blurry when zoomed in, click the SD/HD button to see if it becomes clearer.

Map view toggle. This button is used to toggle between the imagery layer on the map and a topographical/road map with easier to read road and place names. The SD/HD button does not show when in the topographical map view. Personal preference will help users decide which map view to use in which situation, and often both map views will be handy when navigating to a location on the map.

Map legend button. This will open a legend window that includes what the various colours mean for InvasivesBC records, the two letter species codes for all invasive plants in the system, plus the source layer names from the BC Data Warehouse that are included in the layer picker. Click the word “close” in the legend window to get back to the map.



Location accuracy. Use when accessing InvasivesBC via a mobile device to indicate the current accuracy of the GPS unit within your device, as shown by a buffer around the find me blue dot indicator as shown to the right.

Find me. Clicking this button will find your location at that point in time and highlight a blue dot at your location. This feature is most accurate when using InvasivesBC on a mobile device but is usually close when using a desktop computer.

Selected IAPP record indicator. This icon on the map shows the location of the currently selected IAPP site in the tables at the bottom of the Recorded Activities page.

Selected InvasivesBC record indicator. This icon on the map shows the location of the currently selected IAPP site in the tables at the bottom of the Recorded Activities page.

Jump to Record button. This icon is ONLY shown on the map page within the current activity page. When opening an InvasivesBC record, click this button to zoom into the geometry associated with that record. When creating a record, if you have drawn and saved a geometry but then moved around on the map, this button can be clicked to return to the geometry associated with the record.

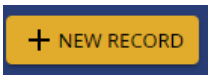
InvasivesBC cluster icons. The rings on the map indicate that InvasivesBC records are in this area, and as the map is zoomed in, the clusters will be refined and more detailed as the zoom level increases. The various colours in the ring indicate the proportion of each type of InvasivesBC records in that area. See the legend for which colour indicates which record type (ie. observations, treatments, etc.)

This button is used to copy the IAPP site ID to the clipboard for pasting into another document or email etc. because right clicking within the tables and selecting copy does not work. There is a matching button for InvasivesBC records beside this one. The record number is included within the button for the record selected in the table. If it says “undefined”, no record is selected.

4.0 Entering Data into InvasivesBC

4.1 Overview

All records entered into InvasivesBC require a single geometry (ie polygon) attached to them. For users familiar with the previous provincial database called IAPP, the main fundamental difference is that InvasivesBC no longer has “sites” that all survey, treatment and monitoring records are attached to like IAPP did. Rather, all records are stand-alone and un-linked, except for monitoring records which are linked to a treatment. The Observation, treatment and biocontrol records are not linked to each other in any way except for through spatially on the map based on their geometry.

To create a new record, click the 

button on the recorded activity page, and then choose the type of record to create by selecting a record category (plant), a record type (Observation, Treatment, Biocontrol or Monitoring) and a Record sub-type (see options in table in section 4.2 below). Once the record type is chosen, a new record will open in the Current Activity page.

Terrestrial vs Aquatic forms. InvasivesBC has both aquatic and terrestrial observation, chemical and mechanical treatment forms and separate aquatic and terrestrial invasive plant lists (see Appendix 1, tables 1.iii and 2.x). Note that some species are included on both the terrestrial and aquatic invasive plant lists as they are capable of growing in both environments. For species that can grow in both conditions, the decision of whether to choose an aquatic or a terrestrial form is based on the specific location of the observation or management action, not on the species itself. Aquatic forms should be used when the majority of the invasive species occurrence or treatment occur below the annual average High Water Mark or within the waterbody itself for fully aquatic species.

A number of invasive plants can be growing both in an aquatic environment and terrestrial environment. IMPORTANT: Management of invasive plants in aquatic environments usually requires additional or special authorizations from the Province. These may include:

- Change Approval or Notification of Instream Work in a public waterway.
- Pesticide Use Permit

When to create a new form/Multiple Species. InvasivesBC forms only allow one geometry (polygon) per form, but multiple species may be added into a single record. However, users are likely to encounter areas where multiple species exist. The decision on whether to add additional species and their density and distribution into a single form or whether to create new forms depends on a few considerations in the field. For example, users may decide to include multiple species in a single form when the average geometry of all species is similar, even if the density or distribution vary for

each species, or when they have only surveyed the area represented by the geometry and want to indicate all species found. The comment field can be used to indicate if one of the species actually continues much further but the area for all species included in the record will be the same as it is auto-generated from the geometry on the map. Multiple forms are recommended when separate geometries would more accurately represent the boundary of the extent of each species, and if there is a break of more than 100m with none of the invasive plant being mapped. To speed up the ability to make multiple forms of the same species or sets of species accurately, InvasivesBC has a **copy/paste function** at the bottom of each form so users can complete one form, click the copy button, open a new record of the same form type, and click paste, drawn the new geometry, and then edit any of the fields that are different, and save and submit the record. Note that each species entered into a form will result in a separate record in the database to enable sorting and extracting and reporting by species.

Unless otherwise requested by the Funding Agency, invasive plant occurrences that are continuous, that is, where gaps between plants are less than 100 metres, are to be recorded as one observation. The maximum size for an observation is 50 ha (500,000m^2) Observations that exist at a distance greater than 100 metres apart, with no occurrences of any target species in the gap, should be recorded as separate observations. InvasivesBC allows for data collection at multiple scales of detail, this detail is determined by the management goals related to a species or location. The Funding Agency should specify the level of detail required for field data collection, if different from the 100 metre approach described above.

4.2 Data Entry Forms

InvasivesBC currently has 12 form types available, as outlined below. When a form is initially created, InvasivesBC automatically assigns a unique “record ID” using the year, the codes below to indicate which type of form it is, and 4 unique digits so that each InvasivesBC records have an ID in this format: 23PTO3421.

Workflow	Activity Type	Activity Subtype	Year	First Letter	Second letter	Third letter	4 unique digits automatically assigned
Plant	Terrestrial	Observation	23	P	T	O	1234
Plant	Aquatic	Observation	23	P	A	O	1235
Plant	Terrestrial	Mechanical Treatment	23	P	T	M	1236
Plant	Aquatic	Mechanical Treatment	23	P	A	M	1237
Plant	Terrestrial	Chemical Treatment	23	P	T	C	1238
Plant	Aquatic	Chemical Treatment	23	P	A	C	1239

Plant	Biocontrol	Biocontrol Dispersal Monitoring	23	P	B	D	1245
Plant	Biocontrol	Biocontrol Release	23	P	B	R	1242
Plant	Biocontrol	Biocontrol Collection	23	P	B	C	1243
Plant	Monitoring	Biocontrol Release Monitoring	23	P	B	M	1244
Plant	Monitoring	Chemical Monitoring	23	P	M	C	1240
Plant	Monitoring	Mechanical Monitoring	23	P	M	M	1241

4.3 Filling out the forms

Creating a geometry. Once the record type is chosen as outlined above and a new record opens in the current activity page, the first step is to create the geometry of the record in the map. Use the drawing tools on the map to create a buffered line (linear polygon), polygon, square, or point (1 sq. m polygon). The geometry in the form auto-fills the location information (lat/long and UTMs) and the area field (in sq. m.). To find your location, click the "find me" icon on the bottom left of the map within the current activity page and then draw the geometry on the map, or use the "drop pin" button at the top of the map page to quickly place a point (1 sq m polygon) at your current location. Click the "jump to record" icon to navigate to the point created. If you have collected a UTM in the field, click the "Enter UTM Manually" button at the top of the map on the current activities page and it will zoom to that location and allow you to draw the geometry required.

Auto-filled Fields. The employer and funding agency fields in each form auto-fill with only the options associated with the logged in users access account. The users name and pesticide applicator number and service licence, if applicable will also auto-fill based off the logged-in users account but can be over-written if necessary (ie. If the person completing the activity is not the person entering the data).

Auto-suggestion of Jurisdiction. The jurisdiction field has an auto-suggestion feature based of a large jurisdiction layer that the developers of InvasivesBC created using multiple layers from the BC DataWarehouse. When a user clicks on the drop down for jurisdiction, the suggested jurisdiction(s) based on the location of the geometry in the map are shown at the top of the list with a star beside them. Users are ultimately responsible for choosing the correct jurisdiction from the list based on the location on the ground.

Well warning system. Observation and Chemical Treatment forms in InvasivesBC autofill a list of the top 5 closest wells to the geometry drawn on the map including distances away, and will prompt users with a warning window if mapped well(s) or water intake(s) are within 30m of the edge of the geometry. *IMPORTANT: Not all wells and*

water licence intakes are mapped so pesticide applicators remain responsible for confirming the location of any wells prior to the start of work.

Save, submit, edit and delete. At the bottom of each form, there are buttons to save, submit and delete records. The forms do not auto-save so it is important to click the save button periodically when filling out a form, and before leaving the current activity page. When the save button is clicked, it will initiate the forms validation rules and highlight anything that does not meet the requirements in red. All mandatory fields and validation rules must be satisfied before the form will allow a user to save "without errors", and then the submit to database button will activate. Clicking submit will send the record into the InvasivesBC database where all users will be able to see it, whereas saved and un-submitted records are saved as drafts and only the user that created the draft can see it. To edit or delete the record, open it from the Recorded Activities page and if the access level allows the record to be edited or deleted, changes can be made. Any modifications made are tracked at the top of the form where it says "date created" and "date modified".

4.3.1 Invasive Plant Form Fields

This section provides a description of each of the InvasivesBC forms, including details on how to complete all fields for each form. Appendix 1 is referenced throughout and contains the list of all code table or "drop down" options associated with each field. This section also indicates which fields are mandatory for submission of a form. Reminder that a geometry is required for each form in InvasivesBC, and the geometry auto-fills the location information, as well as the area in sq. m.

The tables below are color coded as follows:

- Yellow tables have form information that is common to all InvasivesBC observation, treatment and biocontrol records.
- Green tables have form information for Terrestrial Plants.
- Blue tables have form information specific to Aquatic Plants
- Pink tables have form information specific to Biocontrol records.
- Orange tables have form information for Monitoring records.

4.3.1.1 Basic Information Fields on all forms

The Basic Information required for each observation and treatment is the same.

Table 1 - Basic Information	
Activity Photos	Optional. Add photos using your camera or from your gallery
Date/Time	Mandatory: enter or choose from calendar. The date and time the occurrence was found.
Area (m2)	Auto-filled from geometry created on the map. In Meters squared.
Latitude/Longitude **UTM Zone/Easting/Northing**	Auto-filled from geometry created on the map.
Employer	Mandatory Auto-filled from the information supplied when the user signed into InvasivesBC. Enter Name of the company or agency that the person is directly employed by. **See a full list of options here: Appendix 1.i.**
Funding Agency	Mandatory. Auto-filled from the information supplied when the user signed into InvasivesBC. **See a full list of options here: Appendix 1.i.a.** Select the funding agency that is paying for the work to be done. If multiple funders exist or in cases when an agency has been hired to manage the work on behalf of the primary funding agency, multiple Funding Agencies may be chosen. However, multiple funding agencies must first have been indicated when the user signed into InvasivesBC.
Jurisdictions	Mandatory. Text entry, a list appears as you type. **See a full list of options here: Appendix 1.ii.** This is the entity that has responsibility for the land base or waterbody where the infestation occurs. If the infestation falls on 2 or more jurisdictions, add jurisdictions using ADD ITEM and enter the % of each jurisdiction. Total must add to 100%. The data from observations and treatments with more than one jurisdiction can be split *after* the data is entered – when extracted from the database.
Location Description	Mandatory. Text Entry. Provide location directions – include both general area and how to get to the infestation. Format should be: General area of the province, closest town, Invasive Plant/Species Management Area (if applicable), road access directions from a landmark, ground access directions using direction and distance from a landmark. For example: NW BC, Smithers, Bulkley IPMA, Railroad Ave., 10 meters N from 30 km speed sign.
Access Description	Optional. Text Entry. Additional location information to find the infestation. Include the location of gates or hazards such as wet areas or needing an ATV or walk-in access or that the infestation is in a particular location within the geometry. Example of good location description will include regional district, closest municipality, proximity and orientation to majority landmarks. For example: Fraser Valley RD, 2km east of Mission, north side of Hwy 7 at upstream end of CP culvert.–
Project Code	Optional. Text entry.

	User defined identifier that can be used to filter or sort records. This is useful information for cross-referencing the paper and electronic files. The format of this field varies widely between agencies. This replaces the IAPP Paperfile ID. Additional Codes can be added if desired using ADD ITEM.
Comment	Optional. Text entry. Description of any supporting information about the observation that is not captured elsewhere (up to 2000 characters).

4.3.1.2 Terrestrial and Aquatic Observation Forms:

When a target species is found, the information can be recorded on a Terrestrial or Aquatic Invasive Plant Observation Record. See above for more information on when to use aquatic vs. terrestrial forms and how to handle multiple species within a form. Whether it is an update to existing observation or a brand new observation to the area, a new unlinked observation form is required, and therefore information specific to the observation *location* must be recorded as well as data specific to the *survey* of the invasive plant species infestation(s).

For both Terrestrial and Aquatic plants, the General Observation Fields are the same and listed below:

Table 2 – General Observation Fields	
Pre-treatment Observation	Select Yes or No or Unknown. Yes if the observation was completed directly before a treatment occurs No if the observation is occurring after the treatment or during a separate survey.
Observation Person(s)	Auto-filled. Mandatory. Format: First Name, Last Name Use ADD ITEM to include additional persons
Soil Texture	Select from the drop-down menu. **See a full list of options here: Appendix 1.iv.** Relative amount of sand, silt, clay, organic matter, and bedrock throughout the observation area.
Specific Use	Mandatory. Select from the drop-down menu. **See a full list of options here**: **Appendix 1.v**. Notable land uses or attributes within the observation area. Options such as Numbered Highway or Sensitive Site. Useful for reviewing observations in data summaries or choosing observations to monitor
Slope	Mandatory. Select from the drop-down menu. **See a full list of options here: Appendix 1.vi.** Exact or general slope of the land expressed as a percentage.
Aspect	Mandatory. Select from the drop-down menu. **See a full list of options here: Appendix 1.vii.** Average orientation that slope is facing within the observation area (e.g.; SE = southeast).
Research Observation	Mandatory. Select Unknown, Yes or No. Is this observation part of a research project? Add details in project code or comments fields
Visible Well nearby	Mandatory. Select Unknown, Yes or No

	Choose Yes if there is a **visible well or other domestic water intake** nearby. Look for a well head, dugout, pump house, etc. Indicate the distance from the observation in the comments.
Suitable for Biocontrol agent(s)	Select Yes, No or Unknown Choose Yes if the infestation is large, evenly infested and the site appears secure from future disturbance.

Terrestrial Observations

Table 3 - Terrestrial Plant Observation Form Fields	
Invasive Plants	Mandatory. Select from the drop-down menu. **See a full list of invasive plant options here: Appendix 1.iii.** Target invasive plant species for this observation at this location. Use ADD ITEM to create a separate observation for any other species at this location. See note above (Section g: Observations) for direction on when to add an additional invasive plant OR create a new observation.
Observation Type	Mandatory. Select Positive Occurrence or Negative Occurrence. Occurrence describes the presence or absence of target invasive plants within a defined area. **Positive** – if the plant is found. Additional fields will appear for Density, Distributionand Life Stage **Negative** – if the plant is **not** found – used for extent surveys such as roads or large areas where the target invasive plant is not found.
Density (plants/m^2)	Mandatory. Select from drop-down menu. **See a full list of options here: Appendix 1.viii.** Density code describes the average number of individual plants per square meter expressed as a density class code. Provides planners with the density of the species within the occurrence area.
Distribution	Mandatory. Select from the drop-down menu. **See a full list of options here: Appendix 1.ix.** Description of the average arrangement of invasive plant clusters within the observation area expressed as a distribution code. Provides planners with the distribution of the species within the occurrence area.
Life Stage	Mandatory. Select from the drop-down menu. **See a full list of options here: Appendix 1.x.** Average phenological stage of plant. For example: rosettes, seedlings, mature: flowering, etc.
Voucher Specimen Collected	Mandatory. Select Yes or No **Yes** – if Voucher Specimen has been collected. Selecting Yes will bring up additional Fields: Voucher Sample ID, Date Voucher Collected, Date Voucher Verified, Name of Herbarium, Accession Number, Voucher verification completed by: Name, Organization. Exact UTM Coordinates of the voucher collection site: UTM Zone, UTM Easting, UTM Northing. **See Description in Table 6 below.**

Aquatic Observations

Observations of invasive plants found in aquatic environments, including when the majority of an infestation is below the average annual high water mark, should be entered into the Aquatic Plant Observation forms.

When entering Aquatic plant presence surveys or extent surveys (see B.C. Aquatic Invasive Species Survey Methods), a user will need to enter information on the waterbody where the infestation occurs.

Table 4 - Aquatic Plant Observation Form Fields: WATERBODY DATA	
Waterbody Type	Mandatory. Select from the drop-down menu. **See a full list of options here: Appendix 2.i.** Select best description of waterbody type such as Lake or Bog.
Waterbody Name (Gazetted)	Optional. Text Entry. Legally gazetted name of the waterbody.
Waterbody Name (Local)	Optional. Text Entry. Locally referred-to name of the waterbody.
Waterbody Access	Optional. Text entry. Describe the access used to enter the waterbody. Public access options preferred. Indication of walk-in or drive-in and hardness of substrate is helpful.
Waterbody Use	Optional. Select from the drop-down menu, multiple selections allowed. **See a full list of options here: Appendix 2.ii**. Choose all observed uses of waterbody that apply such as Boating or Fishing. If Other is chosen, add details in the comments.
Water Level Management	Optional. Select from the drop-down menu, multiple selections allowed. **See a full list of options here: Appendix 2.iii.** Select existing infrastructure, if any, that could allow water level management such as a dam or weir. If Other is chosen, specify what it is in Comments field.
Substrate Type	Mandatory. Select from the drop-down menu. **See a full list of options here: Appendix. 2.iv.** Select the most prevalent substrate composition such as sand or clay.
Tidal Influence	Mandatory. Select Yes, No or Unknown. Indicate if the water level at the observation point is tidally influenced.
Adjacent Land Use	Optional. Select from the drop-down menu, multiple selections allowed. **See a full list of options here: Appendix 2.v.** Select all adjacent land uses that apply such as highway or agriculture and add details in the comment box.
Inflow (Permanent)	Optional. Select from the drop-down menu. **See a full list of options here: Appendix 2.vi.** Select one or more inflow types (aka upstream source) such as Creek or Wetland and indicate details and name of source water in the comments if known.
Inflow (Seasonal)	Optional. Select from the drop-down menu. **See a full list of options here: Appendix 2.vii.** Select one or more temporary inflow types such as a seasonal creek and indicate details or name of the source water in the comments if known.
Outflow (Permanent)	Optional. Select from the drop-down menu. **See a full list of options here: Appendix 2.viii.** Select one or more outflow types (downstream) such as a Creek or Culvert and indicate details or name of outflow water in the comments if known.

Outflow (Seasonal)	Optional. Select from the drop-down menu. **See a full list of options here: Appendix 2.viii.** Select one or more outflow types (downstream) such as a Creek or Culvert and indicate details or name of outflow water in the comments if known.
Comment	Optional. Text entry Any additional information about the waterbody.
Shoreline Type	Optional. Select from the drop-down menu. **See a full list of options here: Appendix 2.ix.** Describe shoreline composition adjacent to observation (e.g., rip rap, road/parking lot, overhanging natural riparian veg, turf, fence, etc.)
Percent Covered	Number. Enter or use up and down arrows. Percent of total waterbody covered by this shoreline type. Use ADD ITEM to add additional Shoreline Types. Total of all Shoreline types must be 100%
Water Quality	These fields are optional.
Maximum Depth	Number: Enter depth in meters at the point of observation.
Secchi Depth	Number: Enter the secchi depth in meters at the point of observation. The secchi depth indicates water column visibility by measuring the depth of the water beyond which a high-contrast pattern on a submerged disk is no longer visible.
Water Colour	Text: Specify the water colour. Where there is a distinct colour or sheen to the water, this observation can be a useful indication of high nutrient levels or other pollution.

Table 5 - Aquatic Plant Observation Form Fields	
Suitable for Biocontrol Agent(s)	Select Yes, No or Unknown Choose Yes if the infestation is large, evenly infested and the site can be secured from future disturbance.
Sample Point ID	Optional. Text Entry. Used for Presence surveys. Number each sample point in the same waterbody (e.g., 001, 002, 003 etc.). **Do not use for Extent Surveys.**
Invasive Plant Species	Mandatory. Select from the drop-down menu**. See a full list of invasive plant options here: Appendix 2.x.** For Presence survey: select all species observed at coordinates. For Extent Survey: select target species for survey
Observation Type	Mandatory. Select **Positive or Negative**. **Positive** – if the plant is found. Additional fields will appear for Distribution, Density and Life Stage **Negative** – if the plant is not found
Density (plants/m^2)	Mandatory. Select from drop-down menu. **See a full list of options here: Appendix. 1.viii.** Density code describes the average number of individual plants per square meter expressed as a density class code. Provides planners with the density of the species within the occurrence area
Distribution Code	Mandatory. Select from the drop-down menu**. See a full list of options here: Appendix 1.ix.**

	Description of the average arrangement of invasive plant clusters within the observation area expressed as a distribution code. Provides planners with the distribution of the species within the occurrence area
Life Stage	Mandatory. Select from the drop-down menu. **See a full list of options here: Appendix 1.x.** Average phenological stage of plant for example: rosettes, seedlings, mature- flowering, etc.
Voucher Specimen Collected	Mandatory. Select Yes/No **Yes** – if Voucher Specimen has been collected. Selecting Yes will bring up additional Fields: Voucher Sample ID, Date Voucher Collected, Date Voucher Verified, Name of Herbarium, Accession Number, Voucher verification completed by: Name, Organization. Exact UTM Coordinates of the voucher collection site: UTM Zone, UTM Easting, UTM Northing SEE DESCRIPTIONS IN **TABLE 6.**

For both Terrestrial and Aquatic plant observations, there is the ability to enter information about any pressed or preserved voucher samples collected, if appliable:

Table 6 - Voucher Specimen Collection Information Form Fields (only appear when Yes is selected to "Voucher Specimen Collected?")	
Voucher Sample ID	Text and/or Number Entry Unique identifier for each sample collected
Date Voucher Collected	Select from Calendar pop-up.
Date Voucher Verified	Select from Calendar pop-up. This will typically remain blank at the time of creating the observation record and will be populated at a later date once the voucher is verified by a reliable taxonomic expert.
Name of Herbarium	Text Entry of where the sample was sent for identification
Accession Number	Text entry. This will typically remain blank at the time of creating the observation record and will be populated at a later date once the voucher is verified by a reliable taxonomic expert.
Voucher verification completed by (Mandatory once a verification date is entered):	
Name	Text entry. First Name, Last Name
Organization	Text Entry
Exact UTM Coordinates of Voucher Collection Site: **UTM Zone** **UTM Easting** **UTM Northing**	Enter Coordinates of where the Voucher Sample was collected. Zone Easting Northing

4.3.1.3 Terrestrial and Aquatic Chemical Treatment Forms

Terrestrial and Aquatic Chemical treatment entries are “stand alone” in InvasivesBC – they are not tied to a previous Observation entry. You must first define the area that you are treating on the map and fill out the general information outlined above before moving on to the Chemical Treatment portions of the forms.

InvasivesBC chemical treatment forms have been designed with data checks and auto-calculations to improve data quality. These calculations happen as the data is entered allowing you to check your work as you go.

- If a scenario is not allowed (for example – granular herbicide with stem injection) an error message will occur. **See a full list of allowed chemical treatment scenarios here: Appendix 3.vii**
- In the herbicide section of the form, error messages appear at the top of the form prior to any data being entered. These will disappear as data is entered.
- Calculation results will appear below the fields entered to allow you to check your work. **See a full list of calculations here: Appendix 3.vii**
- Treatments are not automatically “tied” to an observation so a new Basic Information Form must be filled out for each treatment. See **Section f** above for descriptions of the Basic Information form fields.

When entering Chemical Treatments, first enter General chemical treatment Information (Table 7, below) followed by the details of the herbicide used for the chemical treatment (Table 8). Both sections apply for Terrestrial and Aquatic chemical treatments.

Chemical Treatment Information – applies for both Terrestrial and Aquatic Plants

Table 7 - Chemical Treatment Information – GENERAL	
Treatment Person – Person Name	Mandatory. Auto-filled. Format: First Name, Last Name Use ADD ITEM to include additional persons
Pesticide Applicator Certificate Number	Mandatory. Auto-filled. Optional over-ride if entering the data for someone other than the person logged into InvasivesBC.
Well ID	This field is autofilled if InvasivesBC detects a mapped well within the vicinity of a treatment. If nothing is entered, there are no mapped wells found. However, this does NOT mean there are no wells present. It is the applicators responsibility to confirm the absence of wells prior to applying herbicide at all times.
Well Proximity (m)	This field is autofilled if InvasivesBC detects a mapped well within the vicinity of a treatment. If nothing is entered, there are no mapped wells found. However, this does NOT mean there are no wells present. It is the applicators responsibility to confirm the absence of wells prior to applying herbicide at all times.
Service Licence Number & Company Name	Mandatory. Select from the drop-down menu or begin typing and the list will appear. **See a full list of Employer/Organization names here: Appendix 1.i.** Current/valid employer/organization name or enter a new Service License number and company name that is doing the chemical treatment. The Province does not

	require a service license so those users with the employer as any BC Government Ministry will have 00000 auto-filled for their service license number**.**
Pesticide Use Permit	Optional. Text entry of the PUP number. Enter if the treatment is being done under a Pesticide Use Permit. Aquatic chemical treatments will typically occur under the authority of a Pesticide Use Permit. The only scenarios that will not warrant a Pesticide Use Permit are where chemical treatments occur under federal research permits granted by Health Canada or where aquatic chemical treatments occur in private waterbodies.
Pest Management Plan	Optional. Select from the Drop-down menu. **See a full list of options here: Appendix 3.i.** Enter if this treatment is being done under a Provincial Public Land PMP
PMP # not in dropdown	Optional. Text entry or leave blank. Include an alternative PMP number here if it is not available on the drop-down list in the "Pest Management Plan" field or leave blank if the work is being done on Private Land
Temperature (Air) (Celsius)	Mandatory. Enter the air temperature in Celsius at the time of the treatment. Check the label for the maximum air temperature at which a herbicide can be applied. A warning will appear if the temperature is below 15C and above 28C.
Wind Speed (km/hr)	Mandatory. Enter the wind speed in km/hr. Check the herbicide label for the maximum windspeed allowed during treatment. It is generally not recommended to apply herbicide using foliar application methods when the wind exceeds 8 km/h or when it is dead calm.
Wind Direction	Mandatory. Select from the drop-down menu or begin typing and the menu will appear. **See a full list of options here: Appendix 3.ii.** This is the cardinal (compass) direction that the wind is coming from or No Wind.
Humidity	Optional. Select from the drop-down menu which includes options from 0 to 100 in increments of 10. This is the relative humidity at the treatment site at the time of treatment.
Treatment Notice Signs	Mandatory. Select Yes or No. **Yes** –if treatment sign(s) were installed at entrance point to the treatment area. If **No**, indicate in the comments why not.
Precautionary Statement	Required field under the BC Integrated Pest Management Regulation when working under a license or authorization. Select from the drop-down menu. **See a full list of options here: Appendix 3.vi.** Precautions may include re-entry times, irrigation restrictions and other precautions that may be indicated on the label for the treated area. You can choose "more information in comments" and include any additional precautions that are pertinent to the herbicide and infestation location.
NTZ (No Treatment Zone) Reduction **Rationale for NTZ Reduction**	Mandatory. Yes or No Required field under the BC Integrated Pest Management Regulation when working under a license or authorization for reducing the No Treatment Zone (NTZ) adjacent to water from 10 meters (from High Water Mark) to 1.0 meters. If YES, then the additional field will appear "Rationale for NTZ Reduction". Enter text explaining why a NTZ reduction is needed for this treatment. Note: Only the PMP or Permit Holder may approve an NTZ reduction on Public lands.

Additional/unmapped Wells or Water Licence intakes within 30m	Check Box. Check if there are additional/unmapped wells or water license intakes within 30 meters of the treatment area (Terrestrial treatment) or if there are water intakes within the distance listed on the herbicide label for Aquatic chemical treatment. You can look up registered groundwater wells here: https://apps.nrs.gov.bc.ca/gwells/
Application Start Time	Mandatory. Enter or choose from calendar. The date and time the treatment was started.
Pest Injury Treatment Threshold	Mandatory. Choice of 2 options. Required field under the BC Integrated Pest Management Regulation when working under a license or authorization. **Injury Threshold** means *the point at which the abundance of pests and the damage they are causing or are likely to cause indicates that pest control is necessary or desirable.* **Choose either:** A full survey was completed prior to herbicide application. The survey determined that injury thresholds had been met to fulfill IPM obligations. OR No threshold determination was completed.

Table 8 - Chemical Treatment Details – GENERAL these are the same for Terrestrial & Aquatic	
For details on chemical treatment Scenarios that are acceptable and Calculation Details, see Appendix 3.vii	
Invasive Plants **Invasive Plant #1**	Click on "+ ADD INVASIVE PLANT" Select from Drop-down menu.. **. See a full list of invasive plants here: Appendix 1.iii. and Appendix 2.x.** To add another Invasive Plant Click on "+ADD INVASIVE PLANT" again. If more than one is chosen, a new field will appear to enter the Percent Area Covered (%) of each species treated. Total of all species must be = 100.
Tank Mix	Select ON or OFF. Default is OFF. **ON** allows the addition of herbicides up to a maximum of 3 herbicides. Tank mix calculations can only be done with a Product Application Rate **OFF** is used when only one herbicide is mixed into a tank. Note: if 2 different herbicides are used in 2 different applications on the same site (e.g., 2 different backpacks), then 2 records must be entered. This is not a Tank Mix.
Chemical Application Method	Mandatory. Select from the drop-down menu. Includes Spray or Direct application types. **See a full list of options here: Appendix 3.iii.** **Spray applications**: Fixed Boom, Hand Gun, Back Pack, ATV, Boomless Nozzle -can be used with a tank mix -can use either Product Application Rate or Dilution as the application rate **Direct Applications**: Stem Injection, Basal Bark, Cut and Insert, Cut Stump and Wick -can only be used with Liquid Herbicides -can only use Dilution as the application rate
Herbicide	Click on "+ ADD HERBICIDE" This will bring up the Herbicide #1 box of fields to enter.
Herbicide Type:	Select **Liquid or Granular.** This is the form of herbicide that is used in the application. **Liquid:** a list of liquid herbicides will appear, and the Calculation Type will show Product Application Rate as liters/hectare. **Granular:** a list of granular herbicides will appear, and the Calculation Type will show Product Application Rate as grams/hectare

	Select only one herbicide per record unless it is a tank mix.
Herbicide (Name)	Select from the drop-down menu. **See a full list of herbicides here. Appendix 3.iv. and Appendix 3.v.** The drop-down list will be different for Liquid vs Granular herbicides.
Calculation Type	Select either **Product Application Rate** (liters/hectare) or **Dilution** (%) **Product application rate**: the label recommended rate for treatment of this species that was used to mix the treatment solution. In liters per hectare. **Dilution %** : the label recommended percent solution used to treat this species that was used to mix the treatment solution. Expressed as the percent of herbicide in the solution. Undiluted herbicide is entered as 100%. Only Product Application rate can be used for Granular herbicides. Either Product Application Rate or Dilution % can be used for Liquid Herbicides if allowed on the Herbicide Label
Amount of Mix Used (liters)	This is the amount of mixed herbicide and water (and surfactant if used) that was applied to the area.
Delivery Rate (liters/hectare)	This is the Calibrated Delivery Rate of the equipment used in the herbicide application - the amount of total liquid that the equipment applies per hectare. Delivery rates can range from 100 to 800 liters/ha. Mandatory for Spray applications using Product Application Rate.
Product Application Rate **l/ha or g/ha**	Enter Application Rate used in the treatment. In Liters/ha or Grams/ha. When entered, the system will check to see if the rate entered exceeds the maximum label rate for that herbicide. If so, a warning will appear but will not stop you from entering a rate higher than the maximum label rate.
Dilution %	Enter percent (%) of herbicide product in the Herbicide/water Mix. For example: Undiluted herbicide is entered as 100%, 50% solution is entered as 50.
Area Treated (m2)	This is **auto-filled** with the area outlined on the map **OR** is **entered** by the applicator when using Direct Treatment methods such as Stem Injection. If entered by the applicator, estimate the area treated by adding together the smaller areas treated on the site to total one area. Auto-calculations at the bottom will calculate the % of the total area treated for your reference.

4.3.1.4 Aquatic and Terrestrial Mechanical Treatments

Mechanical treatment entries are “stand alone” in InvasivesBC, they are not tied/linked to a previous Observation entry. You must first define the area that you are treating on the map and fill out the Basic Information before moving on to the Mechanical Treatment portion of the forms.

Mechanical Treatment forms are different for Terrestrial versus Aquatic plants. The details of each of these form types are below.

Table 9 - Terrestrial Plant Mechanical Treatment Details	
Treatment Person(s)	Mandatory. Auto-filled. Format: First Name, Last Name Use ADD ITEM to include additional persons.

Invasive Plant	Mandatory. Select from Drop-down menu.**See a full list of invasive plants here: Appendix 1.iii.** To add another Invasive Plant Click on "+ADD ITEM". If more than one is chosen, a new field will appear to enter the Percent Area Covered (%) of each species treated. Total of all species must be = 100.
Treated Area (m2)	Mandatory. Enter treated area in square meters (m2). Estimate the area treated by adding together the actual patches treated within the infestation area to total one Treated Area. Up/down arrows can be used to change the number.
Mechanical Method	Mandatory. Select from Drop-down menu**. See a full list of treatment methods here: Appendix 4.i.** Specific treatment technique, device, or method used such as Digging or Handpulling.
Disposal Method	Mandatory. Select from Drop-down menu. **See a full list of disposal methods here: Appendix 4.ii.** The refers to how the mechanically treated plants were disposed of.
Disposed Material Format	Optional. Select from drop-down menu to indicate the unit of material being disposed from Number of Plants, Weight (kg) or Volume (m3).
Disposed Material Amount	Text entry. If the Disposed Material is Weight, then the number of total kilograms is entered. If the Disposal Metric is Number of Plants, then the total number of plants is entered. If the Disposal Metric is Volume, then an estimate of total cubic metres is entered.
ADD ITEM	Use only if the additional treatment type is occurring on the same day with the same people in the same treatment area.

Table 10 - Aquatic Plant Mechanical Treatment Details	
Treatment Person(s)	Text entry. Name of the person doing the mechanical treatment. Use **"+ ADD ITEM"** to enter the names of additional people doing the treatment.
Authorization Information	Text entry. Mandatory for work on all lands except Private land. Description of authorization permit for in-stream work (e.g., Change Approval, Notification of In-stream Work, private landowner authorization in private pond, etc.). For more information on water authorizations: https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/water-licensing-rights/water-licences-approvals/apply-for-a-change-approval-or-submit-notification-of-instream-work
Shoreline Type **Percent Covered (%)**	Select from Drop-down menu. **See a full list of Shoreline Types here: Appendix 2.ix.** Describe shoreline composition adjacent to observation (e.g., rip rap, road/parking lot, overhanging natural riparian veg, turf, fence, etc.). Percent covered by this shoreline type. Use **"+ ADD ITEM"** to add additional shoreline types. Estimate total percent of each shoreline type based on entire waterbody shoreline to total 100%.
Invasive Plant	Mandatory. Select from Drop-down menu. **See a full list of invasive plants here: Appendix 2.x.** Select one or more invasive plant species. If more than one is chosen, a new field will appear to enter the % of each species treated. Total of all species must be = 100.
Treated Area (m2)	Mandatory. Enter treated area in square meters (m2). Estimate the area treated by adding together the smaller areas treated on the site to total one area. Up/down arrows can be used to change the number.

Mechanical Method	Mandatory. Select from Drop-down menu. **See a full list of treatment methods here: Appendix 4.i.** Specific treatment technique, device, or method used such as Digging or Handpulling
Disposal Method	Mandatory. Select from Drop-down menu**. See a full list of disposal methods here: Appendix 4.ii.** The refers to how the mechanically treated plants were disposed of.
Disposed Material Format	Optional. Select from drop-down menu to indicate the unit of material being disposed from Number of Plants, Weight (kg) or Volume (m3).
Disposed Material Amount	Text entry. If the Disposed Material is Weight, then the number of total kilograms is entered. If the Disposal Metric is Number of Plants, then the total number of plants is entered. If the Disposal Metric is Volume, then an estimate of total cubic metres is entered.
ADD ITEM	Use only if the additional treatment type is occurring on the same day with the same people in the same treatment area.

4.3.1.5 Biological Control

Introduction: There are four types of Biocontrol forms in InvasivesBC.

1. *Biocontrol collection* (under Record Type: Biocontrol, Record Sub-type: Biocontrol Collection)

2. *Biocontrol release* (under Record Type: Treatment, Record Sub-type: Biocontrol Release)

3. *Biocontrol Release Monitoring* (under Record type: Monitoring, Record Sub-type: Biocontrol Release Monitoring)

4. *Biocontrol Dispersal Monitoring* (under Record Type: Biocontrol, Record Sub-type: Biocontrol Dispersal Monitoring).

Biocontrol release and dispersal monitoring records are “stand alone” in InvasivesBC, they are not tied/linked to a previous Observation record. As with chemical and mechanical treatment monitoring forms, the biocontrol release monitoring is linked to a previous release record.

When completing biocontrol forms, users must first define the geometry (ie polygon) on the map on the current activity page and then fill out the **Basic Information** fields (see Table 1, above). The next sections of all biocontrol forms are called “General Information” and “Microsite Conditions” (Tables 11 and 12, below) which include weather and microsite details that may affect biological control agents. The remainder of the fields vary between the 4 biocontrol related forms, as outlined below.

General Information

Table 11 – General - Weather Conditions	
Temperature (°C)	**Mandatory**. Text entry. Enter the highest temperature (in Celsius) that occurred during the field work .
Cloud Cover	**Mandatory**. Select from drop-down menu. See a full list of options here: **Appendix 5.i.** Enter the average cloud cover over the duration of the field work.
Precipitation	**Mandatory.** Select from drop-down menu. See a full list of options here: **Appendix 5.ii.** Enter the average precipitation over the duration of the field work.
Wind Speed	**Mandatory**. Text entry. Enter the average wind speed (derived from an anemometer) over the duration of the field work (km/h).
Wind Aspect	**Mandatory** if wind is more than zero. Text entry. Direction wind is coming from (azimuth degrees ie. North = 0, South = 180270).
Weather Comments	**Optional.** Text entry.

Microsite Conditions: are required for understanding habitat needs of biocontrol agents

Table 12 – General - Microsite Conditions	
Mesoslope Position	**Optional**. Select from drop-down menu. See a full list of options here: **Appendix 5.iii.** Enter the position on the hill the work is occurring at.
Site Surface Shape	**Optional**. Select from drop-down menu. See a full list of options here: **Appendix 5.iv**. Enter the shape of the landscape surface the work is occurring on.

Biocontrol Collection

Introduction: The Biocontrol collection forms have fields that enable tracking the location of the collection of agents to a former biocontrol release or a dispersal monitoring record. For example, an IAPP site ID can be entered in the "the Historical IAPP Site ID" field if the collection occurs at a location where the release or dispersal monitoring occurred.

InvasivesBC biocontrol collection forms have been designed with data checks and auto-additions to improve data quality. These additions happen as the data is entered allowing you to check your work as you go.

- If a scenario is not allowed (for example – invasive plant species with incorrect biocontrol agent species) an error message will occur – **Coming soon**.

- Total number of current and estimated biocontrol agents is automatically calculated and will appear below the fields entered to allow you to check your work.

Table 13 - Biocontrol Collection	
Invasive Plant Species	**Mandatory**. Select from the drop-down menu. See a full list of options here: **Appendix 1.iii**. Name of the invasive plant species the biocontrol agent is collected from.
Biological Control Agent	**Mandatory**. Select from drop-down menu. See a full list of options here: **Appendix 5.v.** Name of the biocontrol agent collected at the location.
Historical IAPP Site ID	**Optional**. Text entry. Record number from historical Invasive Alien Plant Program (IAPP) data, if existing, to enable tracing to historical biocontrol records.
Collection Type	**Mandatory**. Select Timed or Count. Timed collections are those recorded as the length of Time spent collecting. Count collections are those recorded as the Count (number) of plants the biocontrol agents have been collected from.
Count Duration	**Mandatory** if Timed Collection Type is chosen. Text entry. If Timed Collection Type is selected: enter the total duration in minutes of all time spent collecting by all people collecting (added together).
Plant Count	**Mandatory** if Count Collection Type is chosen. Text entry. If Count Collection Type is selected: enter the total number of plants collected from by all people collecting.
Collection Method	**Mandatory**. Select from drop-down menu. See a full list of options here: **Appendix 5.vi**. Method used for capturing individual biocontrol agents.
Start Collection Date and Time	**Mandatory**. Select from calendar/clock. Enter date (year-month-day) and time (hour:minute am/pm) collection started.
Stop Collection Date and Time	**Mandatory**. Select from calendar/clock. Enter date (year-month-day) and time (hour:minute am/pm) collection ended.
Comments	**Optional**. Text entry.
Actual Quantity and Life Stage of Agent Collected **ADD ITEM**	**Mandatory** if Actual Quantity and Life Stage of Agent Collected is chosen. Click ADD ITEM box.
Actual Biological Agent Quantity	**Mandatory** if Actual Quantity and Life Stage of Agent Collected is chosen. Text Entry. Actual Quantity if the agents and their life stages are readily visible and can be counted as they are collected (e.g. adult weevils).
Actual Biological Agent Stage	**Mandatory** if Actual Quantity and Life Stage of Agent Collected is chosen. Select from the drop-down menu. See a full list of options here: **Appendix 5.viii**. The life stage of the biocontrol agent being collected. The biocontrol agent may exist in more than one life stage, a new entry is required for each.

Total Actual Bioagent Quantity	**Auto-filled**. Total Actual number of all biocontrol agents from all life stages collected.
Estimated Quantity and Life Stage of Agent Collected ADD ITEM	**Mandatory** if Estimated Quantity and Life Stage of Agent Collected is chosen. Click ADD ITEM box. When agents reside within the plant, plant parts that are infested with the agent can be collected. This is often done when the agents are not fully developed (e.g. larvae). An estimate of the quantity of the biocontrol agent collected in each life stage is required. These counts are of agents contained within plant material. Cut open samples of the infested plant parts (e.g. from 10 stems off different plants). Count the exact number of individuals within each life stage present, add the number of each life stage count from all the **sampled** stems together and divide each life stage total by the number of stems sampled for an average count per stem. Multiply this count by the total number of stems collected for an Estimated quantity. This would be repeated for each life stage present.
Estimated Biological Agent Quantity	**Mandatory** if Estimated Quantity and Life Stage of Agent Collected is chosen. Text Entry. Estimated number of agents collected within each life stage.
Estimated Biological Agent Stage	**Mandatory** if Estimated Quantity and Life Stage of Agent Collected is chosen. Select from the drop-down menu. See a full list of options here: **Appendix 5.viii**
Total Estimated Bioagent Quantity	**Auto-filled**. Total estimated number of all biocontrol agents from all life stages collected.
Target Plant Phenology	**Mandatory**. Choose Yes or No. Set of data to indicate the average landscape level phenology of the target invasive plants at the time of collection. See a full list of descriptions here: **Appendix 5.xii.**
Target Plant Heights	**Mandatory** if Target Plant Phenology is Yes. Text entry. Record heights in cm of up to 10 of the tallest target invasive plants at the collection location.
Winter Dormant	**Mandatory** if Target Plant Phenology is Yes. Text entry. Percent out of 100% of target invasive plant present in winter dormant stage.
Seedlings	**Mandatory** if Target Plant Phenology is Yes. Text entry. Percent out of 100% of target invasive plant present in seedling stage.
Rosettes	**Mandatory** if Target Plant Phenology is Yes. Text entry. Percent out of 100% of target invasive plant present in rosette stage.
Bolts	**Mandatory** if Target Plant Phenology is Yes. Text entry. Percent out of 100% of target invasive plant present in bolt stage.
Flowering	**Mandatory** if Target Plant Phenology is Yes. Text entry. Percent out of 100% of target invasive plant present in flowering stage.
Seeds Forming	**Mandatory** if Target Plant Phenology is Yes**.** Text entry. Percent out of 100% of target invasive plant present with seeds forming.
Senescent	**Mandatory** if Target Plant Phenology is Yes**.** Text entry. Percent out of 100% of target invasive plant present in senescence stage (between maturity and death).

Biocontrol Treatment (Release)

Introduction: Biological treatment (release) records are "stand alone" in InvasivesBC, meaning they are not tied/linked to a previous Observation record. When completing a Biocontrol Release form, users must first define the area that you are releasing biocontrol agents into on the map on the current activities page, and then the Basic Information before moving on to the Biocontrol Release specific portions of the forms.

InvasivesBC biocontrol release forms have been designed with data checks and auto-additions to improve data quality.

- If a scenario is not allowed (for example – invasive plant species with incorrect biocontrol agent species) an error message will occur - **Coming soon.**
- Total number of current and estimated biocontrol agents is automatically calculated and will appear below the fields entered to allow you to check your work.
- It is important to track the source of the agents being released, therefore the biocontrol release forms include an "Agent Source" field that must be filled out with as much detail as possible for each release.

Biocontrol Treatment (Release) Information

Table 14 - Biocontrol Treatment (Release)	
Invasive Plant Species	**Mandatory**. Select from the drop-down menu. See a full list of options here: **Appendix 1.iii.** Name of the invasive plant species to be targeted by the biocontrol agent being released**.**
Biological Agent	**Mandatory**. Select from the drop-down menu. See a full list of options here: **Appendix 5.v.** Name of the biocontrol agent liberated at the location.
Linear Segment	**Optional.** Select from Yes, No or Unknown. Yes, if the invasive plant infestation is primarily linear in nature. No, if the invasive plant infestation is primarily not linear in nature. Unknown, if it is not known if the invasive plant infestation is primarily linear in nature.
Mortality	**Mandatory**. Text entry. Number of agents of the quantity to be released that are found dead at time of release.
Agent Source	**Mandatory**. Text entry. Details of where the agents were collected from or reared. Include IAPP site ID, or an InvasivesBC Collection # or a description of the location if the source is outside BC. **A source is not a person** but may be an agency with the city of that agency (e.g. CABI Switzerland).
Collection Date	**Optional**. Select from calendar. Enter year/month/day and hour/minute of when bioagents were collected.

Plant Collected From	**Optional**. Select from the drop-down menu. See a full list of options here: **Appendix 1.iii.** Name of the invasive plant species the biocontrol agent was collected from.
Plant collected From - unlisted	**Optional**. Text entry. Name of the invasive plant species the biocontrol agent was collected from if it is not currently listed in InvasivesBC for selection.
Actual Quantity and Life Stage of Agent Released **ADD ITEM**	**Mandatory** if Actual Quantity and Life Stage of Agent Released is chosen. Click ADD ITEM box.
Actual Biological Agent Quantity	**Mandatory** if Actual Quantity and Life Stage of Agent Released is chosen. Text Entry. Actual Quantity of agents released within each life stage (e.g. adult weevils).
Actual Biological Agent Stage	**Mandatory** if Actual Quantity and Life Stage of Agent Released is chosen. Select from the drop-down menu. See a full list of options here: **Appendix 5.viii**. The life stage of the biocontrol agent being released. The biocontrol agent may exist in more than one life stage, a new entry is required for each.
Total Actual Bioagent Quantity	**Auto-filled**. Total Actual number of all biocontrol agents from all life stages released.
Estimated Quantity and Life Stage of Agent Released ADD ITEM	**Mandatory** if Estimated Quantity and Life Stage of Agent Released is chosen. Click ADD ITEM box. When agents reside within the plant, plant parts that are infested with the agent can be released. This is often done when the agents are not fully developed (e.g. larvae). An estimate of the quantity of the biocontrol agent collected in each life stage is required. **The Estimated Quantity should be provided by the collectors. It is possible to derive this number from the infested plants/plant parts provided but this decreases the quantity available for release. Caution must be taken to not sample too many plants/plant parts if there are low numbers supplied.** These counts are of agents contained within plant material. Cut open samples of the infested plant parts (e.g. from 10 stems off different plants). Count the exact number of individuals within each life stage present, add the number of each life stage count from all the **sampled** stems together and divide each life stage total by the number of stems sampled for an average count per stem. Multiply this count by the total number of stems released for an Estimated quantity. This would be repeated for each life stage present.
Estimated Biological Agent Quantity	**Mandatory** if Estimated Quantity and Life Stage of Agent Released is chosen. Text Entry. Estimated Quantity of agents released within each life stage (e.g. adult weevils).
Estimated Biological Agent Stage	**Mandatory** if Estimated Quantity and Life Stage of Agent Released is chosen. Select from the drop-down menu. See a full list of options here: **Appendix 5.viii**
Total Estimated Bioagent Quantity	**Auto-filled**. Total estimated number of all biocontrol agents from all life stages released.
Target Plant Phenology	**Mandatory.** Choose Yes or No. Set of data to indicate the average landscape level phenology of the target invasive plants at the time of release. See a full list of descriptions here**: Appendix 5.xii.**
Target Plant Heights	**Mandatory** if Target Plant Phenology is Yes. Text entry.

	Record heights in cm of up to 10 of the tallest target invasive plants at the release location.
Winter Dormant	**Mandatory** if Target Plant Phenology is Yes. Text entry. Percent out of 100% of target invasive plant present in winter dormant stage.
Seedlings	**Mandatory** if Target Plant Phenology is Yes. Text entry. Percent out of 100% of target invasive plant present in seedling stage.
Rosettes	**Mandatory** if Target Plant Phenology is Yes. Text entry. Percent out of 100% of target invasive plant present in rosette stage.
Bolts	**Mandatory** if Target Plant Phenology is Yes. Text entry. Percent out of 100% of target invasive plant present in bolt stage.
Flowering	**Mandatory** if Target Plant Phenology is Yes. Text entry. Percent out of 100% of target invasive plant present in flowering stage.
Seeds Forming	**Mandatory** if Target Plant Phenology is Yes**.** Text entry. Percent out of 100% of target invasive plant present with seeds forming.
Senescent	**Mandatory** if Target Plant Phenology is Yes. Text entry. Percent out of 100% of target invasive plant present in senescence stage (between maturity and death).

Biocontrol Monitoring forms

Biocontrol Release Monitoring occurs when monitoring a location where the biocontrol agent has been previously released. (Record located under Record type: Monitoring, Record Sub-type: Biocontrol Release Monitoring)

Biocontrol Dispersal monitoring will take place when monitoring a location where the biocontrol agent has not been previously released but has been found, indicating that it has dispersed or spread to the new area without a release in the area. (Record located under Record Type: Biocontrol, Record Sub-type: Biocontrol Dispersal Monitoring).

Release monitoring records are tied/linked to a previous release record. Users must first define the general area being monitoring for biocontrol agents on the map, fill out the Basic Information and then choose the InvasivesBC Release Record number or the historic IAPP Treatment ID to link the monitoring form to the release before moving on to the Biocontrol Release Monitoring portions of the forms. Once an InvasivesBC release record is chosen, the form will prompt users to select whether they want to copy the exact geometry from the release form for the monitoring form.

Dispersal monitoring records are “stand alone” in InvasivesBC, they are not tied or linked to another record. Users must first define the area that you are monitoring on the map in the current activities page, ensure there are no IAPP or InvasivesBC biocontrol

release records at the chosen location, and if not, fill out the Basic Information section before moving on to the Biocontrol Dispersal Monitoring portions of the forms.
If a user determines the biocontrol agent monitored was previously released at this location, record the data as release monitoring rather than dispersal monitoring.

Table 15 - Biocontrol Release/Dispersal Monitoring	
Linked Treatment ID (Release monitoring only)	**Mandatory**. Select from the drop-down menu. Record release number from InvasivesBC to enable tracing to biocontrol release records where biocontrol agents have been released in the current location.
Legacy IAPP Release ID (Release monitoring only)	**Optional**. Text entry. Record the historic IAPP Treatment ID that describes the prior release of biocontrol agents in the current location.
Monitoring Person	**Auto-filled with the users information that is logged into InvasivesBC but can be overwritten if another user completed the monitoring.**
Weather Conditions	**See Table 11, above for details**
Microsite Conditions	**See Table 12, above for details**
Invasive Plant Species	**Mandatory**. Select from the drop-down menu. See a full list of options here: **Appendix 5.xv. Note: only invasive plants with biocontrol agents currently available in BC are included in the invasive plant lists within the biocontrol forms.** Name of the invasive plant species to be targeted by the biocontrol agent being monitored.
Biological Agent	**Mandatory**: Select from the drop-down menu. See a full list of options here: **Appendix 5.v.** Name of the biocontrol agent monitored at the location.
Biocontrol Present	**Mandatory**. Check box. Check box yes **only if** biocontrol agent is found at the location.
Sign of Biocontrol Presence	**Optional** Appears if the 'Biocontrol Present' check box has been ticked. Select from the drop-down menu. See a full list of options here: **Appendix 5.vii.** The type of activity, or sign or evidence of presence of the biocontrol agent found at the location. Use when no physical biocontrol agent, in any life stage is found.
Monitoring Type	**Mandatory**. Select Timed or Count. **Timed monitor** is recorded as the length of Time (minutes) spent monitoring. **Count monitor** is recorded as the Count (number) of plants the biocontrol agents have been monitored from.
Count Duration	**Mandatory** if **Timed Monitoring Type** is chosen. Text entry. If Timed selected: enter the total duration in minutes of all time spent monitoring by all people collecting (added together).
Plant Count	**Mandatory** if **Count Monitoring Type** is chosen. Text entry. If Count selected: enter the total number of plants monitored by all people monitoring.
Monitoring Method	**Mandatory**. Select from drop-down menu**. See a full list of options here: **Appendix 5.xiii.**

	Method used for monitoring individual biocontrol agents.
Linear Segment (Dispersal monitoring only)	**Optional**. Select from Unknown, Yes or No. If the invasive plant infestation is primarily linear in nature, choose Yes.
Monitoring Start Time	**Mandatory**. Select from calendar/clock. Enter date (year-month-day) and time (hour:minute am/pm) collection started.
Monitoring Stop Time	**Mandatory**. Select from calendar/clock. Enter date (year-month-day) and time (hour:minute am/pm) collection stopped.
Location Agent(s) found	**Optional** if Biocontrol Present check box has been ticked. Select from drop-down menu. See a full list of options here: **Appendix 5.ix.** Select the site micro-habitat the biocontrol agent was found in.
Actual Biological Agents ADD ITEM	**Mandatory** if Biocontrol Present check box has been ticked and Actual Biological Agents is chosen. Click ADD ITEM box. Number of readily visible agents found within a single life stage (e.g. adult weevils) and can be counted as they are monitored.
Actual Biological Agent Stage	**Mandatory** if ADD ITEM Actual Biological Agents is chosen. Select from the drop-down menu. See a full list of options here: **Appendix 5.viii**. The life stage of the biocontrol agent found. The biocontrol agent may exist in more than one life stage, a new entry is required for each.
Actual Biological Agent Quantity	**Mandatory** if ADD ITEM Actual Biological Agents is chosen. Text entry. Number of readily visible agents found within a single life stage (e.g. adult weevils).
Plant Position	**Mandatory** if ADD ITEM Actual Biological Agents is chosen. Select from drop-down menu. See a full list of options here: **Appendix 5.x.** Select the general location on the plant that most agents in this life stage have been found.
Agent Location	**Mandatory** if ADD ITEM Actual Biological Agents is chosen. Select from drop-down menu. See a full list of options here: **Appendix 5.xi**. *Within the plant position category*, select the precise location on/within the plant that most agents in this life stage have been found.
Additional Actual Agent Quantity and Life stage	**Optional**. Click ADD ITEM box. ADD additional agent life stage and quantity if another life stage was monitored.
Total Actual Bioagent Quantity	**Auto-filled**. Total actual number of all biocontrol agents from all life stages found.
Estimated Biological Agents **ADD ITEM**	**Mandatory** if Biocontrol Present check box has been ticked and if Estimated Biological Agents is chosen. Click ADD ITEM box. When agents reside within the plant, infested plant parts can be monitored. This is often done when the agents are not fully developed (e.g. larvae). An estimate of the quantity of the biocontrol agent found in each life stage is required. These counts are of agents contained within plant material. Cut open samples of the infested plant parts (e.g. from 10 stems off different plants). Count the exact number of each life stage present, add the number of each life stage count together and divide each life stage total by the number of stems sampled for an average count per stem. Multiply this count by the total number of stems monitored for an Estimated quantity. This would be repeated for each life stage present.

Estimated Biological Agent Stage	**Mandatory** if ADD ITEM Estimated Biological Agents is chosen. Select from the drop-down menu. See a full list of options here: **Appendix 5.viii**. The life stage of the biocontrol agent found. The biocontrol agent may exist in more than one life stage, a new entry is required for each.
Estimated Biological Agent Quantity	**Mandatory** if ADD ITEM Estimated Biological Agents is chosen. Text entry. Estimated number of agents found within each life stage.
Estimated Plant Position	**Mandatory** if ADD ITEM Actual Biological Agents is chosen. Select from drop-down menu. See a full list of options here: **Appendix 5.x**. Select the general location on the plant that most agents in this life stage have been found.
Estimated Agent Location	**Mandatory** if ADD ITEM Estimated Biological Agents is chosen. Select from drop-down menu. See a full list of options here: **Appendix 5.xi**. *Within the plant position category*, select the precise location on/within the plant that most agents in this life stage have been found.
Additional Estimated Agent Quantity and Life stage	**Optional**. Click ADD ITEM box. ADD additional agent estimated life stage and quantity if another life stage was monitored.
Total Bioagent Quantity (Estimated)	**Auto-filled**. Total estimated number of all biocontrol agents from all life stages found.
Suitable for Collection	**Optional**. Select Unknown, Yes or No. Unknown if uncertain if the biocontrol agent population at the location is large enough to yield collectable numbers. Yes if the biocontrol agent population at the location is large enough to yield collectable numbers. No if the biocontrol agent population at the location is not large enough to yield collectable numbers.
Target Plant Phenology	**Mandatory**. Choose Yes or No. Set of data to indicate the average landscape level phenology of the target invasive plants at the time of monitoring. See a full list of descriptions here: Appendix 5.xii.
Target Plant Heights	**Mandatory if Target Plant Phenology is Yes**. Text entry. Record heights in cm of up to 10 of the tallest target invasive plants at the monitoring location.
Winter Dormant	**Mandatory if Target Plant Phenology is Yes**. Text entry. Percent out of 100% of target invasive plant present in winter dormant stage.
Seedlings	**Mandatory** if Target Plant Phenology is Yes. Text entry. Percent out of 100% of target invasive plant present in seedling stage.
Rosettes	**Mandatory** if Target Plant Phenology is Yes. Text entry. Percent out of 100% of target invasive plant present in rosette stage.
Bolts	**Mandatory** if Target Plant Phenology is Yes. Text entry. Percent out of 100% of target invasive plant present in bolt stage.
Flowering	**Mandatory** if Target Plant Phenology is Yes. Text entry.

	Percent out of 100% of target invasive plant present in flowering stage.
Seeds Forming	**Mandatory** if Target Plant Phenology is Yes**.** Text entry. Percent out of 100% of target invasive plant present with seeds forming.
Senescent	**Mandatory** if Target Plant Phenology is Yes**.** Text entry. Percent out of 100% of target invasive plant present in senescence stage (between maturity and death).
Spread Results (Release monitoring only)	**Mandatory**. Choose Yes or No. Monitoring technique that records the distance biocontrol agents have spread beyond the release UTM to 100m. Beyond 100m is dispersal monitoring. For more information on how to collect this data see **Appendix 5.xl**.
Agent Density	**Optional if Spread Details Recorded is Yes.** Text entry. Several aspects are chosen (typically four cardinal directions, i.e. 0/360, 90, 180 and 270 depending on the shape of the landscape location) to traverse for monitoring. Divide 100 m by the number of directions chosen (e.g. 25m in each of the four cardinal directions). Walk a straight line in each chosen direction and choose a plant closest to the toe of the boot at each 1m. Monitor for the agent. Record all agents at each plant monitoring location on a separate piece of paper (Appendix 5.xi) and include the output here. Percent agent density is: (total # agents found on the plants monitored divided by total # plants monitored) x 100.
Plant Attack	**Optional if Spread Details Recorded is Yes**. Text entry. Several aspects are chosen (typically four cardinal directions, i.e. 0/360, 90, 180 and 270 depending on the shape of the landscape location) to traverse for monitoring. Divide 100 m by the number of directions chosen (e.g.. 25m in each of the four cardinal directions). Walk a straight line in each chosen direction and choose a plant closest to the toe of the boot at each 1m. Monitor for the agent. Record all agents at each plant monitoring location on a separate piece of paper (Appendix 5.xi) and include the output here. Percent plant attack is: (total # agents found on the plants monitored divided by total # plants monitored that had agents) x 100.
Max Spread Distance	**Mandatory if Spread Details Recorded is yes**. Text entry. Distance (m): Record the greatest distance the agent has spread from the release UTM.
Max Spread Aspect	**Mandatory if Spread Details Recorded is Yes**. Text entry. Aspect (degrees): Record the direction/aspect of the greatest distance the agent has spread from the release UTM.

4.3.1.6 Monitoring of Chemical and Mechanical Treatments

Monitoring records for chemical and mechanical treatment are always linked to an existing chemical or mechanical treatment. Monitoring data included in InvasivesBC is efficacy monitoring and is used to determine the effectiveness of the management actions that occurred on the target invasive plants. The person monitoring should review the treatment record before starting and make observations over the entire treatment area to determine if the management of the entire treatment area is

efficacious. NOTE: A monitoring record cannot be submitted with invasive plants chosen that are missing from the linked treatment record.

Table 16 - Monitoring Fields – GENERAL	
Linked Treatment ID	Mandatory. Text entry. The identifier (number) of the treatment that is being monitored
Copy Geometry	Select Yes or No. **Yes** – select this option to copy the geometry associated with the linked treatment ID. **No** – select this option when only monitoring a portion of the treatment area or when the monitoring area does not match the treatment area.
Monitoring Person	Mandatory. Auto-filled. Format: First Name, Last Name Use +ADD ITEM to include additional persons
Wells Information (only appears when Chemical treatment monitoring is chosen)	**Well ID** – Auto-filled when InvasivesBC finds wells in close proximity. **Well Proximity** – Auto-filled when InvasivesBC finds wells in close proximity
Terrestrial Invasive Plant	Mandatory. Select from Drop-down menu. **See a full list of invasive plants here: Appendix 1.iii.** Select one or more invasive plant species. If more than one is chosen, a new field will appear to enter the % of each species treated. Total of all species must be = 100. If an Aquatic Invasive Plant is chosen, then no Terrestrial plants will appear in the dropdown menu.
Aquatic Invasive Plant	Mandatory. Select from Drop-down menu. **See a full list of invasive plants here: Appendix 2.x.** Select one or more invasive plant species. If more than one is chosen, a new field will appear to enter the % of each species treated. Total of all species must be = 100. If a Terrestrial Invasive Plant is chosen, then no Aquatic Plants will appear in the dropdown menu.
Evidence of Treatment	Mandatory. Choose Yes or No **Yes**, if there is evidence that treatment has occurred. For Chemical treatment this would include evidence such as residual blue dye, twisted plant stalks or yellowing of leaves, etc.. Treatment effects on plants differ with herbicide type. For Mechanical treatment this would include evidence of disturbed soil, cut plants, etc., depending on the type of mechanical treatment used.
Treatment Efficacy Rating	Mandatory. Select from the drop-down menu. **See a full list of options here: Appendix 6.i** A rating of how effective the treatment was for the plants that were treated. If plants were missed, that is included in Management Efficacy Rating (see below). This field is for documenting the success of the treatment on the treated plants. For example: if 50% of the plants *that were treated* were dead as the result of treatment, then choose "50 to 59%".
Management Efficacy Rating	Mandatory. Select from the drop-down menu**. See a full list of options here: Appendix 6.ii**

	A rating of how effective the treatment was overall. Indicates the percentage of plants within the entire infestation that were effectively managed with the treatment. For example: if 85% of the plants *within the infestation* were dead as the result of treatment, then choose “80 to 89%”.
Invasive Plants on Site	Mandatory. Select from the drop-down menu. **See a full list of options here: Appendix 6.iii** Multiple selections are allowed. Used to indicate the types of plant stages that are found within the infestation being monitored.
Treatment Pass	Select from the drop-down menu. Choose from First, Second, Third or Unknown. **See a full list of options here: Appendix 6.iv** This refers to whether the treatment being monitored is the first, second, or third of the season on a given infestation. Choose Unknown if you do not know.
Comment	Optional. Text entry Note whether there is observable chlorosis, necrosis, curling, browning, yellowing, epicormic growth, etc., or any additional relevant information

5.0 InvasivesBC Batch Uploader

5.1 About the Batch Uploader

This tool lets users load multiple observation or treatment records simultaneously via the use of uploaded excel schemas or templates. A template is a csv file that is structured and formatted in a specific way so that the database can write the data from each column to a pre-designated field in the database. It is recommended that each csv file have no more than 200 records for each upload.

Each record type (eg. Terrestrial observation, aquatic observation, terrestrial mechanical treatment, terrestrial chemical treatment etc.) must have its own file using the correct template for that record type. The batch uploader does not permit multiple record types to be uploaded in a single template.

The batch uploader can only be used for uploading new data only; it cannot be used for correcting existing data.

5.2 What to Know before you Start

The templates are in .csv format. The batch uploader will not process any other file format correctly. Although they can be opened and edited in MS Excel, they must be saved as a .csv file. It is best to download the templates from the Templates section of the Batch Uploads page within InvasivesBC, save them to your computer and use them in their downloaded format for uploading to InvasivesBC.

To ensure the batch uploader functions as intended and does not slow down the system, do not upload a single file with over 200 RECORDS PER FILE. If you have

more than 200 records to upload, please split your files into 200 record increments and upload them separately.

The structure of the template files should not be altered in any way; the column headers determine the file's column count. Removing or adding a column will cause an upload error.

The format required for all fields in a specific template can be found on the Templates section of the Batch Uploads page within InvasivesBC as shown in the example below.

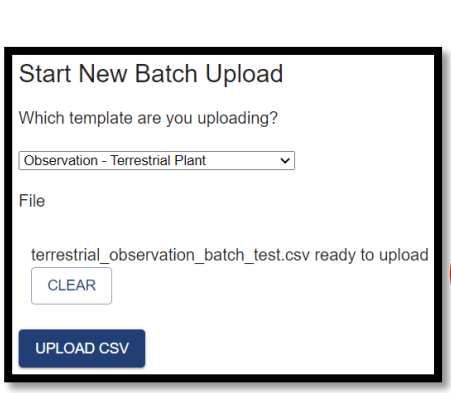
Column	Date Type	Required?	Acceptable Values
WKT	WKT	Yes	
Basic - Date	date	Yes	ISO 8601 Date Format: YYYY-MM-DD
Basic - Employer	codeReference	Yes	Type to filter...

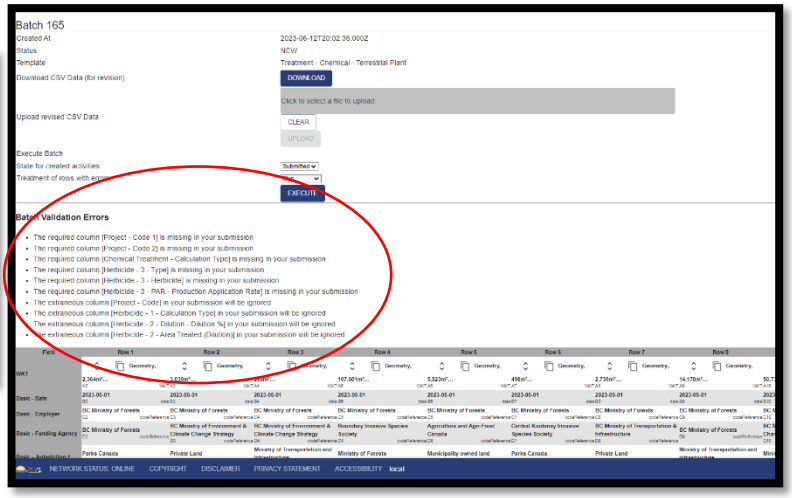
Description	Code
A & A Trading (HAIDA GWAII) LTD.	AA
A Rocha Canada	ARC
Agriculture and Agri-Food Canada	AAFC
Alberni-Clayoquot Regional District	ACRD
Asplundh Canada ULC	ASP
BC Attorney General	AG
BC Hydro and Power Authority	BCH
BC Ministry of Advanced Education and Skills Training	AEST
BC Ministry of Agriculture and Food	AGRI
BC Ministry of Children & Family Development	CFD

Showing 10 of 284. ALL

When uploading a new batch of records, users must follow the steps outlined below:

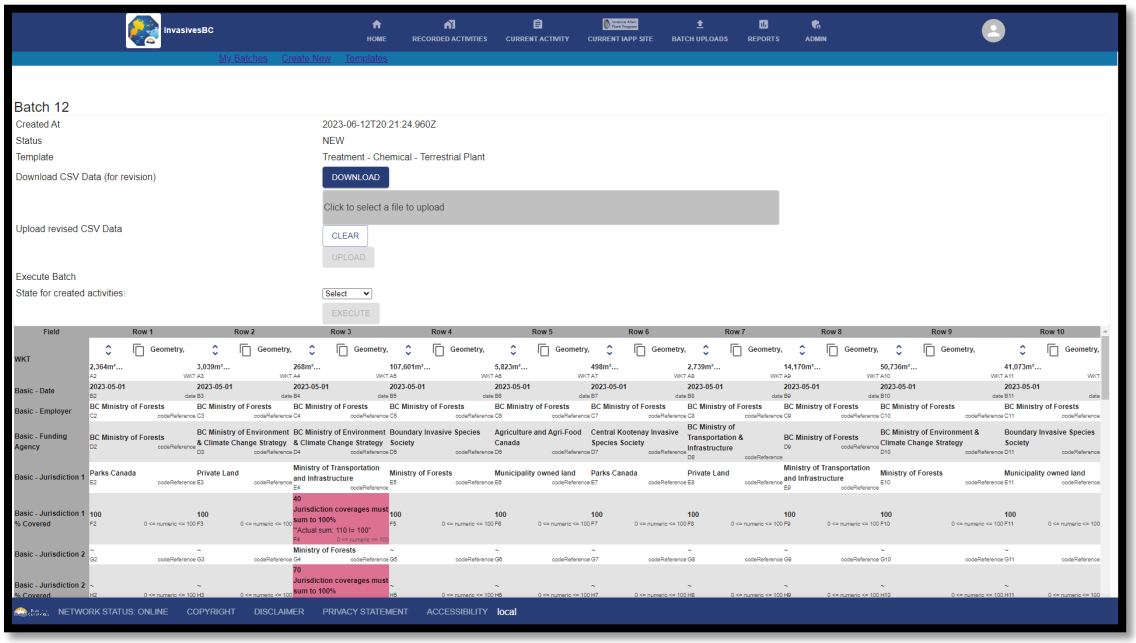
1. Select the correct template to indicate the record type being uploaded.
   NOTE: Using the wrong template will result in errors and records will not be able to be submitted. If errors are found in the batch schema, they will be listed in a bulleted list on the batch page after you have uploaded your .csv file as shown on the right below.





2. Click in the grey box under the heading “file” to choose a .csv file from your computer to upload. Once the correct file is showing as “ready to upload”, click the blue “upload CSV” button.

3. After the .csv is uploaded, a summary table will appear below showing all the records in the .csv. Any fields with errors are indicated in red. This enables the user to scroll through the table to determine if and where errors have occurred and then correct them in the .csv file before submission to InvasivesBC. NOTE: The .csv MUST be corrected so no errors are showing before the greyed out execute button will be activated. To fix the errors in the .csv, a user can either click the “Download” button to open the exact .csv file that was uploaded, or simply fix them in the original .csv file saved on their computer.



4. Once errors have been corrected in the .csv file, click the grey box again to upload the corrected file, and repeat steps 1-3 until no errors are showing in the table.

5. When the table is showing no errors, the file is ready to be executed (ie submitted into InvasivesBC). Before the grey-out button will be activated however, a user must choose whether they want the records to be submitted directed into InvasivesBC, or if they want all records in this batch to just be submitted as drafts from the drop down menu beside “State for created activities” above the table. Draft records are only viewable by the user who uploaded them until they are submitted, whereas submitted records are viewable to all users in InvasivesBC.
NOTE: If a user selects to upload records as Drafts, they will go into the user’s draft table on the recorded activity page and will need to be manually submitted later, one at a time.

6. Once the selections for “State of created activities” has been made, click “EXECUTE” to submit the batch file into InvasivesBC. All files uploaded via an individual batch file are tagged by InvasivesBC with the batch number so that a user can easily sort by that batch in the record tables and view the records uploaded by each batch separately on the map.

IMPORTANT: Taking great care in preparation of your data, and reviewing the upload files carefully, is strongly recommended! Once a file has been loaded into InvasivesBC, any data errors will need to be corrected manually for each individual record!

5.3 InvasivesBC Batch Uploader Templates

There are currently 6 different upload templates available for batch uploading data into InvasivesBC:

- Terrestrial Observation (Regular and “TEMP POINT”)

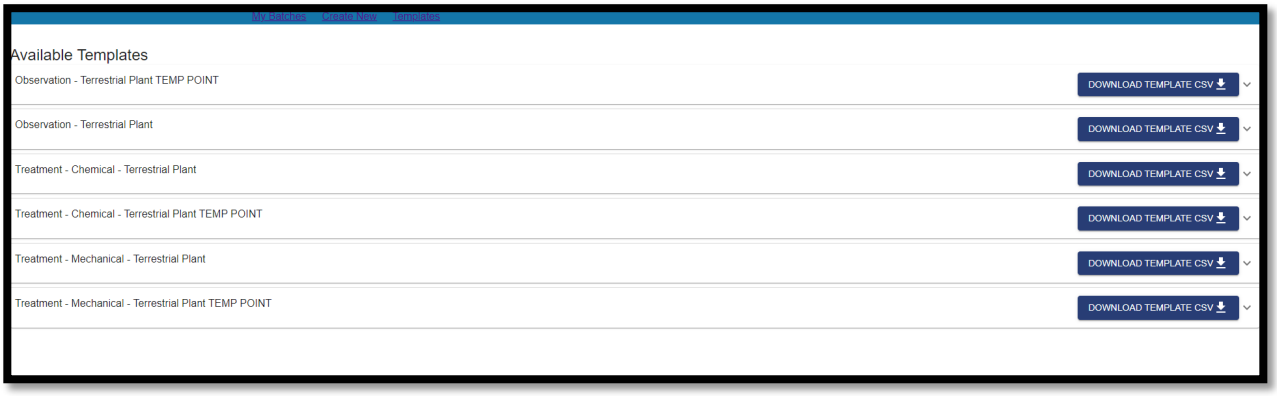
  Use this for uploading observations of terrestrial invasive plants, observations are standalone records of invasive plant sightings and are not linked to previous years observations except by their location.

- Terrestrial Chemical Treatment (Regular and “TEMP POINT”)

  Use this for uploading chemical treatments done on invasive plants in terrestrial environments, treatments are not linked to observations in any way other than by their location.

- Terrestrial Mechanical Treatment (Regular and “TEMP POINT”)

  Use this for uploading mechanical treatments done on invasive plants in terrestrial environments; treatments are not linked to observations in any way other than by their location.



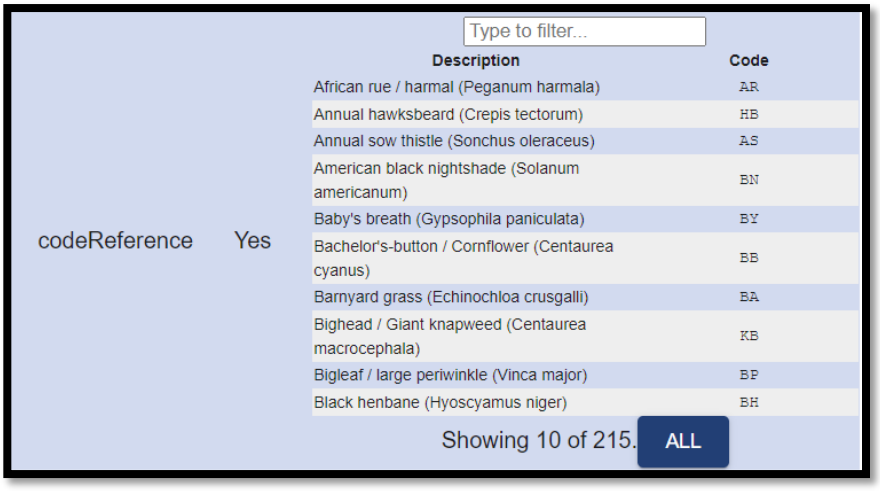
NOTE: The “TEMP POINT” templates are only available for the transition from IAPP – a point based database, to InvasivesBC – a polygon based system, and in particular, to support users collecting point data in external data sets such as Fulcrum. These

three TEMP POINT versions of the templates accept point WKT files and an area field and InvasivesBC will auto-create standardized circular polygons to represent the size included in the area field in the csv (in sq.m). In contrast, the regular templates accept polygon WKT files and InvasivesBC calculates the area based on the size of the polygon submitted. Reminder that points in InvasivesBC are actually 1 sq. m polygons.

Additional information on how to export polygon or point data from external data collection systems and convert into the required WKT files is available on the InvasivesBC web pages.

5.4 Code Tables

Some of the batch uploader template fields require codes that match InvasivesBC codes. This was done for data integrity reasons and to avoid errors. Wherever codes and specific names are required for a field it will be indicated on the Templates section of the Batch Uploads page.



Fields that require a code are labeled “codeReferece” and will show a list of codes for that are accepted for that field. Other batch uploader field types include date, datetime, numeric, text, boolean, and tristate. A description of each field type can be found on the Templates section of the Batch Uploads page.

numeric		Use unquoted values with a decimal point separator . for non-integer values. Negatives prefixed with - accepted. Do not use commas or spaces to group digits.

tristate	Yes	Case insensitive
		
		True values:
		`T, TRUE, Y, or YES`
		
		False values:
		`F, FALSE, N, or NO`
		
		Unknown values:
		`U, or UNKNOWN`

IMPORTANT: ALL BATCH .CSV SCHEMA TEMPLATES REQUIRE A GEOMETRY ATTACHED TO EACH RECORD IN WKT FORMAT. CLICK THIS LINK TO REVIEW DIRECTIONS FOR ATTACHING GEOMETRIES TO BATCH SCHEMAS: https://www2.gov.bc.ca/assets/gov/environment/plants-animals-and-ecosystems/invasive-species/invasivesbc-resources/invasivesbc_exporting_to_wkt_for_batch.pdf

For more information please contact the InvasivesBC Administrators at InvasivesBC@gov.bc.bc or the BC Ministry of Forest's Invasive Plant Program at Invasive.Plants@gov.bc.ca

6.0 Extracting data from InvasivesBC

Data can be viewed and exported from InvasivesBC using the "Reports" page. There are three main sections: IAPP Extracts, InvasivesBC Summaries, and InvasivesBC Spatial Reports.

IAPP Extracts: Contains all information that was available when doing extracts from the legacy IAPP database.

InvasivesBC Summaries: The InvasivesBC version of IAPP extracts, a summary report of all activities of a certain type in table form.

InvasivesBC Spatial Reports: Table/graph reports with a spatial component (Ex. The total area infested by a certain species within each Regional District)

Note: *All area fields in IAPP extracts are in hectares, whereas all area fields in InvasivesBC are in* m^2.

Export options

Data can be exported from the reports page as a csv, xlsx, or json by clicking the cloud icon in the bottom right of the report. All data from the report you are viewing will be exported.

Filtering data

Filtering data in a report can be done using the filter widgets at the top of the report. This is similar to the filter function in excel, click the widget for a field you want to filter, and then select the values to filter by.

Most available filters are check boxes where you can select 1 or more values to filter for. If there is a large list of values to filter by you can begin typing to narrow down the list. Date fields can be filtered by a date range, before/after a certain date, or on a specific day. “Contains” widgets filter by inputted text. For example, if you filtered “Jurisdictions” by typing “Private” the result would be all records with any percentage of Private jurisdiction.

Data can also be sorted alphabetically or smallest/largest by clicking the field heading one or more times.

Summary of available reports

IAPP Extracts	
Biological Dispersal	A Dispersal record is entered when a bioagent has been observed on a site where it was not known to have been released. Therefore, there would be no biological treatment records for that agent on that site. This extract delivers 36 columns; as always, survey data is for the most recent survey.
Biological Monitoring	The biological monitoring extract delivers a whopping 40 columns; survey data is for the most recent survey.
Biological Treatment	The Biological Treatment extract can be run for any number of plant species and any number of bioagents released at the site.
Chemical Monitoring	This treatment monitoring extract delivers the 27 columns; survey data for the most recent survey.
Chemical Treatment	The chemical treatment extract delivers 34 columns; the survey data given will be for the most recent survey.

Invasive Plant No Treatment	As its name implies, the Invasive Plants With No Treatments extract will not deliver all the locations that have the selected invasive plants on it (you'd need to run the Site Selection extract for that), but rather only those sites where the selected plant has never been treated.
Mechanical Monitoring	The mechanical monitoring extract delivers 26 columns; survey data for the most recent survey.
Mechanical Treatment	The mechanical treatment extract delivers 27 columns; survey data given will be for the most recent survey.
Planning	The Planning extract is run to find out which infestations on which sites have had future activity plans created for them by you or any other Agency. These activities include any of the types of treatments and/or monitoring's, bioagent collection, invasive plant, or dispersal surveys.
Site Selection	The Site Selection extract delivers 18 fields of data, for only the most recent survey of each invasive plant species on a site.
Survey	The Survey extract will list all the surveys that were ever done for the plant species selected. (**Note**: if you are only interested in surveys done during a specific year, simply use the filter widget on the survey date field and select the date range you are interested in.)

A summary of all fields available in each IAPP extract is available here: https://www2.qa.gov.bc.ca/assets/gov/environment/plants-animals-and-ecosystems/invasive-species/iapp-resources/iapp_extract_output_columns.pdf?forcedownload=true

InvasivesBC Spatial Reports	
Current Negative Observation	Negative observations of a species that are not completely overlapped by a more recent positive observation of the same species. If there is partial overlap by a more recent positive observation the overlapping area has been removed.
Current Positive Observation	Positive observations of a species that are not completely overlapped by a more recent negative observation of the same species. If there is partial overlap by a more recent negative observation the overlapping area has been removed.
Current Positive Observation Treated	Positive observations of a species that are not completely overlapped by a more recent negative observation of the same species and that have been treated since the observation date. Summary treatment data is appended to this report from both chemical and mechanical treatment records.
Jurisdiction Species Area	Total area of each species on all jurisdictions. This report uses only the current positive area of observation records.

	More recent overlapping negative area has been removed and overlapping positive area is not double counted.
Province-wide Species Area	Total area of each species in BC. This report uses only the current positive area of observation records. More recent overlapping negative area has been removed and overlapping positive area is not double counted.
Regional District Species Area	Total area of each species in each regional district. This report uses only the current positive area of observation records. More recent overlapping negative area has been removed and overlapping positive area is not double counted.
RISO Species Area	Total area of each species in each regional invasives species organization. This report uses only the current positive area of observation records. More recent overlapping negative area has been removed and overlapping positive area is not double counted.

7.0 Contacts and Additional Information

For more information, contact the InvasivesBC Administrator at InvasivesBC@gov.bc.ca or the Ministry of Forests' Invasive Plant Program at Invasive.Plants@gov.bc.ca.

Additional information can also be found on the Province's Invasive Species website at: https://www2.gov.bc.ca/gov/content/environment/plants-animals-ecosystems/invasive-species

Appendix 1: Code Table/Drop Down Options

Table of Contents

1. Terrestrial Plant Observation

1.i. Employer (employer_code)

Code	Employer
AA	A & A Trading (HAIDA GWAII) LTD.
AVCS	Ace Vegetation Control Service Ltd.
AAFC	Agriculture and Agri-Food Canada
ACRD	Alberni-Clayoquot Regional District
ARC	A Rocha Canada
ASP	Asplundh Canada ULC
ATCO	ATCO Wood Products Ltd.
AG	BC Attorney General
BCH	BC Hydro and Power Authority
AEST	BC Ministry of Advanced Education and Skills Training
AGRI	BC Ministry of Agriculture and Food
CFD	BC Ministry of Children & Family Development
CITZ	BC Ministry of Citizens' Services
EDU	BC Ministry of Education
EMLCI	BC Ministry of Energy Mines and Low Carbon Innovation
MOE	BC Ministry of Environment & Climate Change Strategy
FIN	BC Ministry of Finance
MOF	BC Ministry of Forests
MOH	BC Ministry of Health
MIRR	BC Ministry of Indigenous Relations & Reconciliation
JERI	BC Ministry of Jobs Economic Recovery and Innovation
LAB	BC Ministry of Labour
LWRS	BC Ministry of Land Water and Resource Stewardship
MHA	BC Ministry of Mental Health & Addictions
MUNI	BC Ministry of Municipal Affairs
PSSG	BC Ministry of Public Safety & Solicitor General & Emergency B.C.
SDPR	BC Ministry of Social Development & Poverty Reduction
TACS	BC Ministry of Tourism Arts Culture and Sport
MOTI	BC Ministry of Transportation & Infrastructure
BCP	BC Parks
BCTS	BC Timber Sales
BISS	Boundary Invasive Species Society
CRM	Cabin Resource Management
CFP	Canadian Forest Products Ltd.
CRD	Capital Regional District
CCCIPC	Cariboo Chilcotin Coast Invasive Plant Committee Society
CARD	Cariboo Regional District
CCRD	Central Coast Regional District
CKISS	Central Kootenay Invasive Species Society
COABB	City of Abbotsford
COARM	City of Armstrong
COBUR	City of Burnaby
COCAM	City of Campbell River
COCAS	City of Castlegar
COCHI	City of Chilliwack
COCOL	City of Colwood
COCOQ	City of Coquitlam
COCOU	City of Courtenay
COCRA	City of Cranbrook
CODAW	City of Dawson Creek
CODEL	City of Delta
CODUN	City of Duncan
COEND	City of Enderby
COFER	City of Fernie
COFORT	City of Fort St. John

COGRA	City of Grandforks
COGRE	City of Greenwood
COKAM	City of Kamloops
COKEL	City of Kelowna
COKIM	City of Kimberley
COLANGF	City of Langford
COLANGLE	City of Langley
COMAP	City of Maple Ridge
COMER	City of Merritt
COMIS	City of Mission
CONAN	City of Nanaimo
CONEL	City of Nelson
CONEW	City of New Westminster
CONOR	City of North Vancouver
COPAR	City of Parksville
COPEN	City of Penticton
COPIT	City of Pitt Meadows
COPORALB	City of Port Alberni
COPORCOQ	City of Port Coquitlam
COPOR	City of Port Moody
COPOW	City of Powell River
COPRIGE	City of Prince George
COPRIRUP	City of Prince Rupert
COQUE	City of Quesnel
COREV	City of Revelstoke
CORIC	City of Richmond
COROS	City of Rossland
COSAL	City of Salmon Arm
COSUR	City of Surrey
COTER	City of Terrace
COTRA	City of Trail
COVAN	City of Vancouver
COVER	City of Vernon
COVIC	City of Victoria
COWES	City of West Kelowna
COWHI	City of White Rock
COWIL	City of Williams Lake
CISC	Coastal Invasive Species Committee Society
CRE	CoastRange Environmental Ltd.
CSISS	Columbia Shuswap Invasive Species Society
CSRD	Columbia Shuswap Regional District
CFGP	Cortes Forestry General Partnership
CVRD	Cowichan Valley Regional District
CPR	CP Rail
CVWMA	Creston Valley Wildlife Management Area
DND	Department of National Defense
DOHMH	District of 100 Mile House
DOBAR	District of Barriere
DOCEN	District of Central Saanich
DOCHE	District of Chetwynd
DOCLE	District of Clearwater
DOCOL	District of Coldstream
DOELK	District of Elkford
DOFORT	District of Fort St. James
DOHIG	District of Highlands
DOHOP	District of Hope
DOHOU	District of Houston
DOHUD	District of Hudson's Hope
DOINV	District of Invermere
DOKEN	District of Kent
DOKIT	District of Kitimat
DOLAK	District of Lake Country

DOLAN	District of Lantzville
DOLIL	District of Lillooet
DOLOG	District of Logan Lake
DOMAC	District of Mackenzie
DOMET	District of Metchosin
DONEW	District of New Hazelton
DONORC	District of North Cowichan
DONORS	District of North Saanich
DONOR	District of North Vancouver
DOOAK	District of Oak Bay
DOPEA	District of Peachland
DOPOREDW	District of Port Edward
DOPORHARD	District of Port Hardy
DOSAA	District of Saanich
DOSEC	District of Sechelt
DOSIC	District of Sicamous
DOSOO	District of Sooke
DOSPA	District of Sparwood
DOSQU	District of Squamish
DOSTE	District of Stewart
DOSUM	District of Summerland
DOTAY	District of Taylor
DOTOF	District of Tofino
DOTUM	District of Tumbler Ridge
DOUCL	District of Ucluelet
DOVAN	District of Vanderhoof
DOWES	District of West Vancouver
DRFN	Doig River First Nation
DWES	Drinkwater Environmental Services
DUC	Ducks Unlimited Canada - Canards Illimites Canada
EKISS	East Kootenay Invasive Species Council
ESI	Econics Services Inc.
EEC	Ecoscape Environmental Consultants Ltd.
ECCC	Environment and Climate Change Canada
EDI	Environment Dynamics Inc.
FWCP	Fish and Wildlife Compensation Program - Columbia Basin
FRS	FortisBC Inc.
FVISS	Fraser Valley Invasive Species Society
FVRD	Fraser Valley Regional District
GFS	Generous Forest Services
Gold	Golder Associates Ltd.
GBL	Gorman Brothers Lumber Ltd.
HC	Hatfield Consultants
HMV	High Mountain Ventures Ltd.
HAA	Huu-ay-aht First Nations
IFC	Interfor Corporation
IWC	Interior Weed Control Ltd.
ISCBC	Invasive Species Council of British Columbia Society
ISCMV	Invasive Species Council of Metro Vancouver Society
IOOF	Island Municipality of Bowen Island
JPE	Juno Peak Enterprises Ltd.
KMC	Kinder Morgan Canada
KBRD	Kootenay Boundary Regional District
KGM	Kootenay Ground Maintenance
KWC	Kootenay Weed Control
KWIK	Kwikwetlem First Nation
LML	Lakeland Mills Ltd.
LGL	LGL Ltd.
LRISS	Lillooet Regional Invasive Species Society
LPC	Louisiana-Pacific Canada Ltd.
LKB	Lower Kootenay Band
MSI	Matrix Solutions Inc.

MCEL	McElhanney Ltd.
MLMC	McLeod Lake Mackenzie Community Forest
MRMC	McTavish Resource & Management Consultants Ltd.
MVRD	Metro Vancouver Regional District
MBL	Morrow Bioscience Ltd.
MFM	Mosaic Forest Management
MOMUN	Mountain Resort Municipality of Jumbo Glacier
MOMUNSUNP	Mountain Resort Municipality of Sun Peaks
NCRD	North Coast Regional District
NRRM	Northern Rockies Regional Municipality
NWIPC	Northwest Invasive Plant Council
NRQ	Not required
NRE	Ntityix Resources
OOSIM	Okanagan and Similkameen Invasive Species Society
PCAN	Parks Canada
PEL	Pathfinder Endeavours Ltd.
PRRD	Peace River Regional District
PGEC	Pottinger Gaherty Environmental Consultants Ltd.
qRD	qathet Regional District
QTS	Quartech Systems
RDNO	Regional District North Okanagan
RDBN	Regional District of Bulkley-Nechako
RDCK	Regional District of Central Kootenay
RDCO	Regional District of Central Okanagan
RDEK	Regional District of East Kootenay
RDFFG	Regional District of Fraser-Fort George
RDKS	Regional District of Kitimat-Stikine
RDMW	Regional District of Mount Waddington
RDN	Regional District of Nanaimo
RDOS	Regional District of Okanagan-Similkameen
ROOF	Resort Municipality of Whistler
RBCM	Royal BC Museum
SCW	Scw'exmx Tribal Council
SSISC	Sea to Sky Invasive Species Council
SIGD	Sechelt Indian Government District
SKC	Selkirk College
SHR	Sellentin's Habitat Restoration
SIB	Skeetchestn Indian Band
SIF	Slocan Integral Forestry Cooperative
SNC	SNC-Lavalin Inc.
SFC	Somerville Forestry Consulting
SFF	Southern Frontier Forestry Services
SRG	Spectrum Resource Group Inc.
SLRD	Squamish-Lillooet Regional District
STAN	Stantec
SRD	Strathcona Regional District
SCRD	Sunshine Coast Regional District
TTL	Tanizul Timber Ltd.
TDB	TDB Consultants Inc.
TCP	Teal Cedar Products Ltd.
TECK	Teck Resources Ltd.
NCC	The Nature Conservancy of Canada
NTBC	The Nature Trust of BC
TNIPMC	Thompson Nicola Invasive Plant Management Committee
TNRD	Thompson Nicola Regional District
TRU	Thompson Rivers University
TIB	Tobacco Plains Indian Band
TIL	Tolko Industries Ltd.
TOCOM	Town of Comox
TOCRE	Town of Creston
TOGIB	Town of Gibsons
TOGOL	Town of Golden

TOLAD	Town of Ladysmith
TOLAK	Town of Lake Cowichan
TOOLI	Town of Oliver
TOOSO	Town of Osoyoos
TOPOR	Town of Port McNeill
TOPRI	Town of Princeton
TOQUA	Town of Qualicum Beach
TOSID	Town of Sidney
TOSMI	Town of Smithers
TOVIE	Town of View Royal
TOESQ	Township of Esquimalt
TOLAN	Township of Langley
TOSPA	Township of Spallumcheen
TS	Trailmark Systems Inc.
TTM	Ts'elxweyeqw Tribe Management Ltd.
UBC	University of British Columbia
VRS	Vast Resource Solutions Inc.
VOALE	Village of Alert Bay
VOANM	Village of Anmore
VOASH	Village of Ashcroft
VOBEL	Village of Belcarra
VOBUR	Village of Burns Lake
VOCAC	Village of Cache Creek
VOCAN	Village of Canal Flats
VOCHA	Village of Chase
VOCLI	Village of Clinton
VOFRA	Village of Fraser Lake
VOFRU	Village of Fruitvale
VOGOL	Village of Gold River
VOGRA	Village of Granisle
VOHAR	Village of Harrison Hot Springs
VOHAZ	Village of Hazelton
VOKAS	Village of Kaslo
VOKER	Village of Keremeos
VOLIO	Village of Lions Bay
VOLUM	Village of Lumby
VOLYT	Village of Lytton
VOMAS	Village of Masset
VOMCB	Village of McBride
VOMID	Village of Midway
VOMON	Village of Montrose
VONAK	Village of Nakusp
VONEW	Village of New Denver
VOPEM	Village of Pemberton
VOPORALICE	Village of Port Alice
VOPORCLEM	Village of Port Clements
VOPOU	Village of Pouce Coupe
VOQUE	Village of Queen Charlotte
VORAD	Village of Radium Hot Springs
VOSAL	Village of Salmo
VOSAY	Village of Sayward
VOSIL	Village of Silverton
VOSLO	Village of Slocan
VOTAH	Village of Tahsis
VOTEL	Village of Telkwa
VOVAL	Village of Valemount
VOWAR	Village of Warfield
VOZEB	Village of Zeballos
WCE	Westcoast Energy Inc.
WFP	Western Forest Products Inc.
WFRM	West Fork Resource Management Ltd.
WFM	West Fraser Mills Ltd.

WSP	Whitestar Property Services Ltd.
WS	Wildsight
WFS	Woodlot Forestry Services Ltd.
WSPG	WSP Global Inc.
YRL	Yendor Logging

1.i.a. Funding Agency (invasive_species_agency_code)

Code	Agency
AAFC	Agriculture and Agri-Food Canada
ACRD	Alberni-Clayoquot Regional District
APO	Apollo Forest Products Ltd
ATCO	ATCO Wood Products Ltd
BCH	BC Hydro and Power Authority
AGRI	BC Ministry of Agriculture and Food
CITZ	BC Ministry of Citizens' Services
EDU	BC Ministry of Education
EMLCI	BC Ministry of Energy Mines and Low Carbon Innovation
MOE	BC Ministry of Environment & Climate Change Strategy
MOF	BC Ministry of Forests
MOH	BC Ministry of Health
MIRR	BC Ministry of Indigenous Relations & Reconciliation
JERI	BC Ministry of Jobs Economic Recovery and Innovation
LWRS	BC Ministry of Land Water Resource Stewardship
TACS	BC Ministry of Tourism Arts Culture and Sport
MOTI	BC Ministry of Transportation & Infrastructure
OGC	BC Oil and Gas Commission
BCP	BC Parks
BEL	Bella Bella Asset Holdings Ltd.
BISS	Boundary Invasive Species Society
BCTC	British Columbia Transmission Corporation
CAN	Canfor
CRD	Capital Regional District
CCCIPC	Cariboo Chilcotin Coast Invasive Plant Committee Society
CARD	Cariboo Regional District
CAR	Carrier Lumber Ltd.
CCRD	Central Coast Regional District
CKISS	Central Kootenay Invasive Species Society
COABB	City of Abbotsford
COARM	City of Armstrong
COBUR	City of Burnaby
COCAM	City of Campbell River
COCAS	City of Castlegar
COCHI	City of Chilliwack

COCOL	City of Colwood
COCOQ	City of Coquitlam
COCOU	City of Courtenay
COCRA	City of Cranbrook
CODAW	City of Dawson Creek
CODEL	City of Delta
CODUN	City of Duncan
COEND	City of Enderby
COFER	City of Fernie
COFORT	City of Fort St. John
COGRA	City of Grandforks
COGRE	City of Greenwood
COKAM	City of Kamloops
COKEL	City of Kelowna
COKIM	City of Kimberley
COLANGF	City of Langford
COLANGLE	City of Langley
COMAP	City of Maple Ridge
COMER	City of Merritt
COMIS	City of Mission
CONAN	City of Nanaimo
CONEL	City of Nelson
CONEW	City of New Westminister
CONOR	City of North Vancouver
COPAR	City of Parksville
COPEN	City of Penticton
COPIT	City of Pitt Meadows
COPORALB	City of Port Alberni
COPORCOQ	City of Port Coquitlam
COPOR	City of Port Moody
COPOW	City of Powell River
COPRIGE	City of Prince George
COPRIRUP	City of Prince Rupert
COQUE	City of Quesnel
COREV	City of Revelstoke
CORIC	City of Richmond
COROS	City of Rossland
COSAL	City of Salmon Arm
COSUR	City of Surrey
COTER	City of Terrace
COTRA	City of Trail
COVAN	City of Vancouver
COVER	City of Vernon

COVIC	City of Victoria
COWES	City of West Kelowna
COWHI	City of White Rock
COWIL	City of Williams Lake
CISC	Coastal Invasive Species Committee Society
CSISS	Columbia Shuswap Invasive Species Society
CSRD	Columbia Shuswap Regional District
CVRD	Cowichan Valley Regional District
CPR	CP Rail
DND	Department of National Defence
DHC	Diamond Head Consulting Ltd.
DOHMH	District of 100 Mile House
DOBAR	District of Barriere
DOCEN	District of Central Saanich
DOCHE	District of Chetwynd
DOCLE	District of Clearwater
DOCOL	District of Coldstream
DOELK	District of Elkford
DOFORT	District of Fort St. James
DOHIG	District of Highlands
DOHOP	District of Hope
DOHOU	District of Houston
DOHUD	District of Hudson's Hope
DOINV	District of Invermere
DOKEN	District of Kent
DOKIT	District of Kitimat
DOLAK	District of Lake Country
DOLAN	District of Lantzville
DOLIL	District of Lillooet
DOLOG	District of Logan Lake
DOMAC	District of Mackenzie
DOMET	District of Metchosin
DONEW	District of New Hazelton
DONORC	District of North Cowichan
DONORS	District of North Saanich
DONOR	District of North Vancouver
DOOAK	District of Oak Bay
DOPEA	District of Peachland
DOPOREDW	District of Port Edward
DOPORHARD	District of Port Hardy
DOSAA	District of Saanich
DOSEC	District of Sechelt
DOSIC	District of Sicamous

DOSOO	District of Sooke
DOSPA	District of Sparwood
DOSQU	District of Squamish
DOSTE	District of Stewart
DOSUM	District of Summerland
DOTAY	District of Taylor
DOTOF	District of Tofino
DOTUM	District of Tumbler Ridge
DOUCL	District of Ucluelet
DOVAN	District of Vanderhoof
DOWES	District of West Vancouver
DUC	Ducks Unlimited Canada – Canards Illimites Canada
EKISC	East Kootenay Invasive Species Council
ENB	Enbridge Inc.
FWCP	Fish and Wildlife Compensation Program – Columbia Basin
FRS	FortisBC Inc.
FVISS	Fraser Valley Invasive Species Society
FVRD	Fraser Valley Regional District
GIBR	Gibraltar Mines Ltd.
GBL	Gorman Brother's Lumber
ISCBC	Invasive Species Council of British Columbia Society
ISCMV	Invasive Species Council of Metro Vancouver Society
IOOF	Island Municipality of Bowen Island
KMC	Kinder Morgan Canada
KBRD	Kootenay Boundary Regional District
LM	Lakeland Mills Ltd.
LRISS	Lillooet Regional Invasive Species Society
LPC	Louisiana-Pacific Canada Ltd.
LKB	Lower Kootenay Band
LNT	Lower North Thompson Community Forest Society
MC	Meadow Creek Cedar Ltd.
MVRD	Metro Vancouver Regional District
MTP	Mill & Timber Products Ltd.
MOMUN	Mountain Resort Municipality of Jumbo Glacier
MOMUNSUNP	Mountain Resort Municipality of Sun Peaks
NCRD	North Coast Regional District
NRRM	Northern Rockies Regional Municipality
NWIPC	Northwest Invasive Plant Council
NRQ	Not required
OASISS	Okanagan and Similkameen Invasive Species Society
OIB	Osoyoos Indian Band
PCAN	Parks Canada
PRRD	Peace River Regional District

POTA	Pope and Talbot Ltd.
PRIV	Private
qRD	qathet Regional District
RDNO	Regional District North Okanagan
RDBN	Regional District of Bulkley-Nechako
RDCK	Regional District of Central Kootenay
RDCO	Regional District of Central Okanagan
RDEK	Regional District of East Kootenay
RDFFG	Regional District of Fraser-Fort George
RDKS	Regional District of Kitimat-Stikine
RDMW	Regional District of Mount Waddington
RDN	Regional District of Nanaimo
RDOS	Regional District of Okanagan-Similkameen
ROOF	Resort Municipality of Whistler
RPC	Richmond Plywood Corporation Limited
RBCM	Royal BC Museum
SSISC	Sea to Sky Invasive Species Council
SIGD	Sechelt Indian Government District
SIB	Skeetchestn Indian Band
SIFC	Slocan Integral Forestry Cooperative
WCE	Spectra Energy
SLRD	Squamish-Lillooet Regional District
SRD	Strathcona Regional District
SCRD	Sunshine Coast Regional District
TCP	Teal Cedar Products Ltd.
TER	Terasen Gas Inc
NCC	The Nature Conservancy of Canada
NTBC	The Nature Trust of BC
TNIPMC	Thompson Nicola Invasive Plant Management Committee
TNRD	Thompson Nicola Regional District
TRU	Thompson Rivers University
TPIB	Tobacco Plains Indian Band
TIL	Tolko Industries Ltd.
TOCOM	Town of Comox
TOCRE	Town of Creston
TOGIB	Town of Gibsons
TOGOL	Town of Golden
TOLAD	Town of Ladysmith
TOLAK	Town of Lake Cowichan
TOOLI	Town of Oliver
TOOSO	Town of Osoyoos
TOPOR	Town of Port McNeill
TOPRI	Town of Princeton

TOQUA	Town of Qualicum Beach
TOSID	Town of Sidney
TOSMI	Town of Smithers
TOVIE	Town of View Royal
TOESQ	Township of Esquimalt
TOLAN	Township of Langley
TOSPA	Township of Spallumcheen
TTM	Ts'elxweyeqw Tribe Management Ltd
UBC	University of British Columbia
VOALE	Village of Alert Bay
VOANM	Village of Anmore
VOASH	Village of Ashcroft
VOBEL	Village of Belcarra
VOBUR	Village of Burns Lake
VOCAC	Village of Cache Creek
VOCAN	Village of Canal Flats
VOCHA	Village of Chase
VOCLI	Village of Clinton
VOFRA	Village of Fraser Lake
VOFRU	Village of Fruitvale
VOGOL	Village of Gold River
VOGRA	Village of Granisle
VOHAR	Village of Harrison Hot Springs
VOHAZ	Village of Hazelton
VOKAS	Village of Kaslo
VOKER	Village of Keremeos
VOLIO	Village of Lions Bay
VOLUM	Village of Lumby
VOLYT	Village of Lytton
VOMAS	Village of Masset
VOMCB	Village of McBride
VOMID	Village of Midway
VOMON	Village of Montrose
VONAK	Village of Nakusp
VONEW	Village of New Denver
VOPEM	Village of Pemberton
VOPORALICE	Village of Port Alice
VOPORCLEM	Village of Port Clements
VOPOU	Village of Pouce Coupe
VOQUE	Village of Queen Charlotte
VORAD	Village of Radium Hot Springs
VOSAL	Village of Salmo
VOSAY	Village of Sayward

VOSIL	Village of Silverton
VOSLO	Village of Slocan
VOTAH	Village of Tahsis
VOTEL	Village of Telkwa
VOVAL	Village of Valemount
VOWAR	Village of Warfield
VOZEB	Village of Zeballos
WFM	West Fraser Mills Ltd.
WFP	Western Forest Products Inc.
WEY	Weyerhaeuser Company Limited
WBL	Wynndel Box & Lumber Co. Ltd.

1.ii. Jurisdictions (jurisdiction_code)

Code	Jurisdiction
AAFC	Agriculture & Agri-Food Canada
HYDR	BC Hydro and Power Authority
BCR	BC Rail
BCTC	British Columbia Transmission Corporation
CNR	CN Rail
CPR	CP Rail
DFO	Department of Fisheries and Oceans
DND	Department of National Defense
DOT	Department of Transportation/Federal Highways
ENB	Enbridge
IR	First Nations Reserves
GL	Grazing Lease
MR	Military Reserves
MN	Mining Companies
MAFF	Ministry of Agriculture and Food
MOE	Ministry of Environment & Climate Change Strategy
MOF	Ministry of Forests
LWRS	Ministry of Land, Water & Resource Stewardship
MOTI	Ministry of Transportation and Infrastructure
MUNI	Municipality owned land
OG	Oil and Gas Companies
RAIL	Other Rail
PNG	Pacific Northern Gas
PCAN	Parks Canada
P	Private Land
PP	BC Parks

RD	Regional District owned land
TEL	Telus
TER	Terasen Gas Inc.
TRP	TransCanada Pipelines

1.iii. Terrestrial Invasive Plants (invasive_plant_code)

Invasive Plant Code	Terrestrial Invasive Plant Species
AR	African rue / harmal (Peganum harmala)
HB	Annual hawksbeard (Crepis tectorum)
AS	Annual sow thistle (Sonchus oleraceus)
BN	American black nightshade (Solanum americanum)
BY	Baby's breath (Gypsophila paniculata)
BB	Bachelor's-button / Cornflower (Centaurea cyanus)
BA	Barnyard grass (Echinochloa crusgalli)
KB	Bighead / Giant knapweed (Centaurea macrocephala)
BP	Bigleaf / large periwinkle (Vinca major)
BH	Black henbane (Hyoscyamus niger)
BL	Black knapweed (Centaurea nigra)
RB	Black locust (Robinia pseudoacacia)
BC	Bladder campion (Silene vulgaris)
BW	Blueweed (Echium vulgare)
BO	Bohemian knotweed (Reynoutria / Fallopia x bohemica)
RA	Bristly locust / rose acacia (Robinia hispida)
PB	Broad-leaved peavine (Lathyrus latifolius)
BK	Brown knapweed (Centaurea jacea)
BG	Bulbous bluegrass (Poa bulbosa)
BT	Bull thistle (Cirsium vulgare)
CB	Bur chervil (Anthriscus caucalis)
UR	Bur / Hornseed buttercup (Ceratocephala testiculata)
BD	Butterfly-bush (Buddleja davidii)
FF	Buffalo-bur (Solanum rostratum)
AM	Camel thorn (Alhagi maurorum)
CT	Canada thistle (Cirsium arvense)
CA	Caraway (Carum carvi)
CG	Carpet burweed (Soliva sessilis)
DB	Cheatgrass / downy brome (Bromus tectorum)
LC	Cherry-laurel (Prunus laurocerasus)
CY	Chicory (Cichorium intybus)
CH	Chilean tarweed (Madia sativa)
CE	Clary sage (Salvia sclarea)
CF	Coltsfoot (Tussilago farfara)
AO	Common bugloss (Anchusa officinalis)
BU	Common burdock (Arctium minus)
CO	Common comfrey (Symphytum officinale)
CC	Common crupina (Crupina vulgaris)
DN	Common dead-nettle (Lamium amplexicaule)
PE	Common evening-primrose (Oenothera biennis)

CX	Common hawkweed (Hieracium lachenalii)
ET	Common hawthorn (Crataegus monogyna)
GS	Common groundsel (Senecio vulgaris)
CP	Common periwinkle (Vinca minor)
TC	Common tansy (Tanacetum vulgare)
RR	Corn-spurry (Spergula arvensis)
CR	Creeping buttercup (Ranunculus repens)
CD	Curled dock (Rumex crispus)
CL	Cutleaf evergreen blackberry (Rubus laciniatus)
CS	Cypress spurge (Euphorbia cyparissias)
DT	Dalmatian toadflax (Linaria genistifolia spp. dalmatica)
DR	Dames rocket (Hesperis matronalis)
SL	Daphne / spurge-laurel (Daphne laureola)
FU	Death-cap fungus (Amanita phalloides)
DK	Diffuse knapweed (Centaurea diffusa)
DO	Dodder (Cuscuta spp.)
DE	Dwarf / Japanese eel-grass (Zostera japonica)
DW	Dyer's woad (Isatis tinctoria)
ES	Eggleaf spurge (Euphorbia oblongata)
HO	English holly (Ilex aquifolium)
EI	English ivy (Hedera helix)
EU	European bittersweet / climbing nightshade (Solanum dulcamara)
RC	European Common Reed (Phragmites australis subsp. australis)
EH	European hawkweed (Hieracium sabaudum)
EY	Eyebright (Euphrasia nemorosa)
FY	Fernleaf yarrow (Achillea filipendulina)
FB	Field bindweed (Convolvulus arvensis)
FS	Field scabious (Knautia arvensis)
FP	Flat pea / flat peavine (Lathyrus sylvestris)
FG	Foxglove (Digitalis purpurea)
GM	French broom (Genista monspessulana)
TS	Fuller's Teasel (Dipsacus fullonum)
GL	Garden yellow loosestrife (Lysimachia vulgaris)
AP	Garlic mustard (Alliaria petiolata)
MA	Giant chickweed (Myosoton aquaticum)
GH	Giant hogweed (Heracleum mantegazzianum)
GK	Giant knotweed (Reynoutria / Fallopia sachalinensis)
SW	Giant mannagrass / reed sweetgrass (Glyceria maxima)
AD	Giant reed / giant cane (Arundo donax)
GP	Globe-pod hoarycress (Lepidium appelianum)
RG	Goat's rue / french lilac (Galega officinalis)
GO	Gorse (Ulex europaeus)
GW	Goutweed / bishop's weed (Aegopodium podagraria)
GB	Great burdock (Arctium lappa)
LB	Great leopard's-bane (Doronicum pardalianches)
GC	Greater celandine (Chelidonium majus)
GN	Greater knapweed (Centaurea scabiosa)
GF	Green foxtail / green bristlegrass (Setaria viridis)
HR	Hairy cat's-ear (Hypochaeris radicata)
AH	Halogeton / saltlover (Halogeton glomeratus)
HC	Heart-podded hoarycress (Lepidium / Cardaria draba)
BI	Hedge bindweed (Calystegia sepium)
HD	Hedgehog dogtail (Cynosurus echinatus)
GR	Herb-Robert (Geranium robertianum)
HI	Himalayan blackberry (Rubus armeniacus)
PO	Himalayan knotweed (Persicaria wallichii / Polygonum polystachyum)
HA	Hoary alyssum (Berteroa incana)

HT	Hound's-tongue (Cynoglossum officinale)
IS	Iberian starthistle (Centaurea iberica)
IA	Italian arum (Arum italicum)
IT	Italian plumeless thistle (Carduus pycnocephalus)
JP	Japanese butterbur (Petasites japonicus)
JK	Japanese knotweed (Reynoutria / Fallopia japonica)
JE	Jewelweed / Spotted touch-me-not (Impatiens capensis)
JI	Jimsonweed (Datura stramonium)
GJ	Johnsongrass (Sorghum halepense)
JG	Jointed goatgrass (Aegilops cylindrica)
KH	Kingdevil hawkweed (Pilosella floribunda / Hieracium floribundum)
KO	Kochia / Summer Cypress (Bassia / Kochia scoparia)
KU	Kudzu (Pueraria montana)
LT	Lady's-thumb (Persicaria maculosa / Polygonum persicaria)
LS	Leafy spurge (Euphorbia esula)
LH	Lens-pod / Chalapa hoarycress (Lepidium chalepense)
RF	Lesser celandine / fig buttercup (Ficaria verna / Ranunculus ficaria)
LO	Longspine sandbur (Cenchrus longispinus)
MX	Maltese star-thistle (Centaurea melitensis)
CU	Marsh cudweed (Gnaphalium uliginosum)
MT	Marsh plume thistle / Marsh thistle (Cirsium palustre)
MB	Meadow buttercup (Ranunculus acris)
MC	Meadow clary (Salvia pratensis)
MG	Meadow salsify / goats-beard (Tragopogon pratensis)
MH	Meadow hawkweed (Pilosella caespitosa / Hieracium caespitosum)
MK	Meadow knapweed (Centaurea x moncktonii / debeauxii)
MS	Mediterranean sage (Salvia aethiopsis)
TM	Medusahead (Taeniatherum caput-medusae)
MI	Milk thistle (Silybum marianum)
MO	Mountain bluet (Centaurea montana)
ME	Mouse ear hawkweed (Pilosella officinarum / Hieracium pilosella)
MU	Mullein (Verbascum thapsus)
EM	Myrtle spurge (Euphorbia myrsinites)
NC	Night-flowering catchfly (Silene noctiflora)
NT	Nodding / musk thistle (Carduus nutans)
NA	North Africa grass (Ventenata dubia)
OM	Old man's beard / traveler's joy (Clematis vitalba)
OH	Orange hawkweed (Pilosella aurantiaca / Hieracium aurantiacum)
OD	Oxeye daisy (Leucanthemum vulgare)
EP	Paterson's Curse (Echium plantagineum)
PP	Perennial pepperweed (Lepidium latifolium)
PS	Perennial sow-thistle (Sonchus arvensis)
PT	Plumeless thistle (Carduus acanthoides)
PH	Poison hemlock (Conium maculatum)
PA	Polar hawkweed (Hieracium atratum)
IM	Policeman's helmet / himalayan balsam (Impatiens glandulifera)
PR	Portuguese broom (Cytisus striatus)
LP	Portugese laurel (Prunus lusitanica)
PC	Prickly / rough comfrey (Symphytum asperum)
TO	Princess tree / Royal Paulownia (Paulownia tomentosa)
PV	Puncture vine (Tribulus terrestris)
PD	Purple dead-nettle (Lamium purpureum)
PL	Purple loosestrife (Lythrum salicaria)
PN	Purple nutsedge (Cyperus rotundus)
PU	Purple / red starthistle (Centaurea calcitrapa)
QA	Queen Anne's lace / wild carrot (Daucus carota)
QH	Queendevil hawkweed (Pilosella praealta / Hieracium praealtum)
BR	Red bartsia (Odontites serotina)
RP	Redroot amaranth / rough pigweed (Amaranthus retroflexus)
RE	Reed canary grass (Phalaris arundinacea)
RS	Rush skeletonweed (Chondrilla juncea)
RK	Russian knapweed (Rhaponticum / Acroptilon repens)

RO	Russian olive (Elaeagnus angustifolia)
RT	Russian thistle (Salsola tragus / kali)
TA	Saltcedar / tamarisk (Tamarix ramosissima)
SH	Scentless chamomile (Tripleurospermum inodorum / Matricaria perforata)
SB	Scotch broom (Cytisus scoparius)
ST	Scotch thistle (Onopordum acanthium)
SS	Sheep sorrel (Rumex acetosella)
SP	Shepherd's purse (Capsella bursa-pastoris)
SG	Shiny geranium (Geranium lucidum)
CN	Short-fringed knapweed (Centaurea nigrescens)
SE	Siberian elm (Ulmus pumila)
NS	Silverleaf nightshade (Solanum elaeagnifolium)
FT	Slender meadow foxtail (Alopecurus myosuroides)
BF	Slender false brome / false brome (Brachypodium sylvaticum)
WT	Slenderflower thistle / winged thistle (Carduus tenuiflorus)
MN	Smallflower / small touch-me-not (Impatiens parviflora)
HG	Smooth cat's-ear (Hypochaeris glabra)
SM	Smooth hawkweed (Hieracium laevigatum)
BS	Spanish bluebells (Hyacinthoides hispanica)
SI	Spanish broom (Spartium junceum)
SX	Spotted / mottled hawkweed (Hieracium maculatum)
SK	Spotted knapweed (Centaurea stoebe / biebersteinii)
MV	Spring millet grass (Milium vernale)
TP	Spurge flax (Thymelaea passerina)
CV	Squarrose knapweed (Centaurea virgata ssp. squarrosa)
SJ	St. John's-wort (Hypericum perforatum)
SC	Sulphur cinquefoil (Potentilla recta)
SF	Sweet fennel (Foeniculum vulgare)
SY	Syrian bean-caper (Zygophyllum fabago)
TH	Tall hawkweed (Pilosella / Hieracium piloselloides)
TR	Tansy ragwort (Jacobaea vulgaris / Senecio jacobaea)
TB	Tartary buckwheat (Fagopyrum tataricum)
TX	Texas blueweed (Helianthus ciliaris)
AA	Tree of heaven (Ailanthus altissima)
VL	Velvet-leaf (Abutilon theophrasti)
WA	Wall hawkweed (Hieracium murorum)
WL	Wand loosestrife (Lythrum virgatum)
WG	Western salsify / goat's-beard (Tragopogon dubius)
WP	Whiplash hawkweed (Pilosella flagellaris / Hieracium flagellare)
WC	White cockle (Silene latifolia / Lychnis alba)
SR	White flowered broom (Cytisus multiflorus)
WB	Wild buckwheat (Fallopia convolvulus / Polygonum convolvulus)
WI	Wild chervil (Anthriscus sylvestris)
WF	Wild four o'clock (Mirabilis nyctaginea)
WM	Wild / corn mustard (Sinapis arvensis)
WO	Wild oat (Avena fatua)
PW	Wild / common parsnip (Pastinaca sativa)
JW	Wireweed (Sargassum muticum)
WS	Wood sage (Salvia nemorosa)
WW	Wormwood (Artemisia absinthium)
YA	Yellow archangel (Lamiastrum galeobdolon)
YD	Yellowdevil hawkweed (Pilosella glomerata / Hieracium glomeratum)
HS	Yellow hawkweed species (Hieracium / Pilosella spp.)
YN	Yellow nutsedge / nut-grass (Cyperus esculentus)
YS	Yellow starthistle (Centaurea solstitialis)
YT	Yellow/common toadflax (Linaria vulgaris)

1.iv. Soil Texture (soil_texture_code)

Option	Description / definition

Unknown	Relative amount of sand, silt, clay, organic matter, and bedrock throughout the observation area is unknown.
Coarse	Sand/cobbles/gravel – water drains quickly. A soil particle 0.05 mm to 2mm dia. Usually larger particles than silt and clay. This would generally refer to a site in a gravel pit, natural gravel slope or road edge.
Fine	Clay – compact soil that holds water. A soil class containing >40% clay, <45% sand, and <40% silt. <0.0002 mm dia. Usually makes up the smallest of soil particles.
Medium	Loamy/silty soil – water takes longer to drain. Particles between 0.05 and 0.002 mm dia. Has larger particles than clay.
Organic	Dark soil with organic material. Well decomposed organic matter (humus) imparts silt-like properties to the soil; often occurs on wet sites in association with heavy moss cover, and on grasslands. >30% organic matter. No texture (humus is not used as a determinant of soil texture)

1.v. Specific Use (specific_use_code)

Option	Description / definition
None	
Apiary	A place where bees are kept; a collection of beehives.
Burn Scar	Burned land surfaces caused by wildfire or controlled burns.
Community Pasture	Forage production area for livestock grazing; often established through seeding on disturbed land.
Cultivated Land	Land used for cultivated field crops; also included is bare cultivated land or land under preparation for planting. Excluded are crops grown in crop cover structures such as greenhouses or mushroom barns.
Fire Guard	Also known as a Firebreak. An area of cleared or plowed land intended to check or stop a forest or grass fire.
Gravel Pit	Area of aggregate material extraction, sorting, stockpiling, loading, and other on-site operations.
Industrial Site	Area of land on which is located industrial infrastructure and ancillary works such as mines, well sites, equipment yards, and other facilities.
Mine Site	Area of mechanical disturbance of the ground or any excavation made to explore for or to produce coal, mineral bearing substances, rock, limestone, earth, clay, sand, or gravel. Includes cleared areas, buildings, machinery, and other facilities, all activities undertaken in mining processes, and closed and abandoned mines.
Mine Tailings	Facility for the storage of tailings (residue remaining from the preparation of a concentrate of minerals or coal)
No-spray Zone	An area of land, or water, that must not be treated with pesticides, and must be protected from pesticides moving into it. To be identified, marked/flagged prior to herbicide application.
Numbered Highway	Synonymous with roadway but generally limited to higher-speed roadways in rural and urban areas. Every road, street, lane or right of way designed or intended for or used by the general public for the passage of traffic.
Organic Farm	Private property that has indicated they have an organic status.
Parking Lot	Land, public or private, used for the parking of vehicles.
Quarry	A type of open-pit mine in which activities in relation to rock, industrial minerals, limestone, earth, clay, sand, or gravel occur.
Railway	A track, and by extension network of tracks, along which trains run; includes all branches, sidings, stations, depots, wharves, rolling stock, equipment, works, property and works connected with the railway and bridges, tunnels, or other structures connected with the railway.
Rec site/trail	A site and its ancillary facilities developed by the Ministry of Forests for recreation or to protect a recreation resource.
Research Site	A site where a research project is taking place and where no subsequent activity, save non-destructive inventory or monitoring, should take place without written permission from the jurisdiction land manager or the agency that is listed on the observation record where the research site specific use has been designated.
Reservoir	A large natural or artificial lake, or impoundment, from a dam that primarily exists to store water.

Rest Area	A developed roadside area for the use of the traveling public which must contain a washroom, and often has litter receptacles, picnic tables and other facilities.
Sensitive Area	An identifiable geographic unit of the land base that requires a specific combination of forest practices to adequately protect important values.
Transfer Station/Landfill	A disposal facility where waste is place in or on the land and that is designed, constructed, and operated to prevent any pollution from being caused by the facility outside the area of the facility.
Transmission Line	A corridor right of way for transmission lines connecting the high-voltage power grid.
Within PFZ – Water Body	Pesticide Free Zones (PFZ) are an area into which no pesticide is permitted to enter; PFZs are measured by the horizontal distance from the high water mark and usually protected by a pesticide buffer zone. It is a No-treatment zone sufficient to prevent the release of pesticide spray or runoff into the body of water.
Within PFZ - Well	Pesticide Free Zones (PFZ) are an area into which no pesticide is permitted to enter. It is a No-treatment zone sufficient to ensure that pesticide will not enter the water supply or well.
Yard/ditching waste dump	Illegal dump site that may take many forms including dumping yard waste in a nearby ditch, abandoning a vehicle, camping or bush party leftovers or dumping household or construction waste in the forest. In every case, something is being placed where it doesn't belong.

1.vi. Slope (%) (slope_code)

Code	Drop Down Option
NA	variable
FL	Flat 0 %
NF	Nearly flat 1-4 %
GS	Gentle slope 5-9 %
MS	Moderate slope 10-14 %
SS	Strong slope 15-19 %
VS	Very strong slope 20-24 %
ES	Extreme slope 25-29 %
ST	Steep slope 30-44 %
VT	Very steep slope > 45 %

1.vii. Aspect (aspect_code)

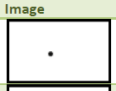
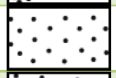
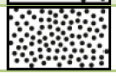
Code	Drop Down Option
FL	Flat
NA	variable
N	North facing
NE	Northeast facing
E	East facing
SE	Southeast facing
S	South facing
SW	Southwest facing
W	West facing
NW	Northwest facing

1.viii. Density (invasive_plant_density_code)

Code	Drop Down Option
U	unknown
L	1|<= 1plant/m2 (Low)
M	2|2-5 plants/m2 (Med)
H	3|6-10 plants/m2 (High)
D	4|>10 plants/m2 (Dense)
	Not Applicable – actual footprint or sample location

1.ix. Distribution (invasive_plant_distribution_code)

Code	Drop Down Option
X	unknown
RS	1|rare individual (a single occurrence)
FS	2|few sporadically occurring individuals
CL	3|single patch or clump of a species
SS	4|several sporadically occurring individuals
FP	5|a few patches or clumps of a species
WS	6|several well-spaced patches or clumps
CU	7|continuous uniform occurrence of well-spaced individuals
CO	8|continuous occurrence of a species with a few gaps in the distribution
CD	9|continuous dense occurrence of a species
NA	Not applicable - actual footprint or sample location

Invasive Plant Survey - Distribution Codes		
Code	Image	Description
1		Rare individual, a single occurrence
2		Few sporadically occurring individuals
3		Single patch or clump of a species
4		Several sporadically occurring individuals
5		A few patches or clumps of a species
6		Several well-spaced patches or clumps
7		Continuous uniform occurrence of well-spaced individuals
8		Continuous occurrence of a species with a few gaps in the distribution
9		Continuous dense occurrence of a species

1.x. Life Stage (plant_life_stage_code)

Code	Drop Down Option
U	unknown
SG	Small germinating plants
RO	Rosettes
SD	Seedlings
SE	Plants are senescing
MP	Mature plants
MFL	Mature: flowering
MIF	Mature: immature fruit
MMF	Mature: mature fruit
MV	Mature: vegetative only
MBD	Mature: in bud
MFD	Mature: fading
MDF	Mature: dispersing fruit
D	Dead
OTH	Other - Add notes in comments

2. Aquatic Plant Observation

2.i. Waterbody Type (waterbody_type_code)

Option	Description / definition
Bog	A peat forming wetland not influenced by surface water from sea, lakes, or streams; ombrotrophic (vegetation only supplied with water from precipitation) mire.
Confined Pond	A pond, the contents of which do not interchange with the surrounding environment.
Discharging Pond	A pond, which discharges its contents into the surrounding environment.
Ditch	A depression or trench, either natural or constructed, that conveys drainage water away from an area. Ditches do not have any headwaters, may be permanently or intermittently wet and do not form part of the natural waterways that drain a watershed. They often undergo mechanical or chemical maintenance and may or may not contain aquatic life.
Intertidal	Denoting an area of a seashore which is covered at high tide and uncovered at low tide.
Lake	A naturally occurring static body of water greater than 2 meters in depth and greater than 1 hectare in size, or a licensed reservoir.
River	A naturally occurring watercourse that mostly has freshwater, and that eventually deposits into oceans, seas, or even other rivers. There are no official definitions for the generic term river as applied to geographic features, although sometimes defined as larger than a creek.
Slough	A slough is a swamp or shallow lake system, usually a backwater to a larger body of water.
Stream	A watercourse that contains water on a perennial or seasonal basis, is scoured by water or contains observable deposits of mineral alluvium, and that (a) has a continuous channel bed that is 100m or more in length, or (b) flows directly into (i) a fish stream or a fish-bearing lake or wetland, or (ii) a waterworks.
Wetland	Means a swamp, marsh, bog, fen, or other similar area that supports natural vegetation that is distinct from adjacent upland areas or enclosed uplands.

2.ii. Waterbody Use (waterbody_use_code)

Option	Description / definition
Agricultural Intake	A water supply intake used for agricultural purposes, including water for livestock or for irrigation of crops.
Boating	The leisurely activity of travelling by boat, or the recreational use of a boat whether powerboats, sailboats, or man-powered vessels, focused on the travel itself, as well as sports activities.
Community Water Intake	The drainage area above the downstream point of diversion on a stream for a water use that is for human consumption and that is license under the *Water Act* for (i) a waterworks purpose, or (ii) a domestic purpose if the license is held by or is subject to the control of the water users' community incorporated under the *Water Act*
Fishing	The activity of catching fish, either for food or as sport.
Industrial Discharge	Liquid waste from industrial activities; may be discharged into surface freshwater, tailing ponds, or groundwater.
Recreation	Refers to the use of the waterbody for the purposes of recreational activities such as swimming, fishing, boating, diving, rafting, and white-water sports.
Spawning Channel	An artificial gravel-bed area in which flow, depth and velocity are controlled at ideal levels for spawning by a particular species or salmon or trout.
Swimming	A recreational area for the activity of swimming.
Other	If other is chosen, add a description in the comments field.

2.iii. Water Level Management (water_level_management_code)

Option	Description / definition
Dam	A barrier constructed to hold back water and raise its level, forming a reservoir used to generate electricity or as a water supply.
None	No management of water level.
Other	Other management method.
Pump Station	A facility containing equipment to move water from one location to another.
Weir	A low dam built across a river to raise the level of water upstream or regulate its flow.

2.iv. Substrate Type (substrate_type_code)

Option	Description / definition
Clay	>0.002-2mm particle diameter, greater ability to retain plant nutrients.
Cobble	>64-256mm particle diameter, typify rapidly flowing waterways.
Gravel	>2-64mm particle diameter.
Rip-rap	Rocks, pieces of used concrete, or other material of various sizes placed firmly or loosely on river banks to prevent scouring by the river, or on slopes or road cuts to prevent erosion
Sand	>2mm particle diameter, typify slow flowing waterways.
Silt/Organic	>0.002-0.05mm particle diameter.

2.v. Adjacent Land Use (adjacent_land_use_code)

Option	Description / definition

Agricultural Operation	Land, and related facilities, used to produce primary agricultural products, such as crops.
Highway	Synonymous with roadway but generally limited to higher-speed roadways in rural and urban areas. Every road, street, lane or right of way designed or intended for or used by the general public for the passage of traffic.
Industrial Site	Land, and related buildings, structures, facilities, use for extracting, processing, manufacturing, storage or transportation of resources such as lumber and pulp mills, mines, large manufacturers of specified products, ship building, and loading terminals.
Livestock	A plot of land used in the farming of livestock, such as a pasture
Parkland	An area of land designated for the protection of natural habitat and wildlife, and for certain recreational activities.
Private Land	Land not owned by the Crown.
Provincial Public Lands	Land owned by the provincial government; this type of land is available to the public for many different purposes – from industry to recreation to research.
Railway	A track, and by extension network of tracks, along which trains run; includes all branches, sidings, stations, depots, wharves, rolling stock, equipment, works, property and works connected with the railway and bridges, tunnels, or other structures connected with the railway.
Recreational Property	Land used solely as an outdoor recreational facility for specific activities such as golf, skiing, ATVing, etc.; may include commercial accommodations to facilitate such activities such as a lodge or clubhouse.
Residential	Land, and buildings, used primarily for the purpose of housing such as single-family residences, multi-family residences, duplexes, apartments, condominiums, nursing homes, seasonal dwellings, and some vacant land.
Small Farms	Land and buildings housing and pasturing one or more types of livestock or growing crops. Lot size ranging from 1 to 5 ha.
Other	Chosen if the required option isn't included in the drop down options. Add notes in comments.

2.vi. Inflow (Permanent) (inflow_permanent_code)

Option	Description / definition
None	
Creek	A stream, brook, or minor tributary of a river.
Culvert	A pipe, pipe arch, or log structure covered with soil and lying below the road surface, used to carry water from one side of the road to the other.
River	A naturally occurring watercourse that mostly has freshwater, and that eventually deposits into oceans, seas, or even other rivers. There are no official definitions for the generic term river as applied to geographic features, although sometimes defined as larger than a creek.
Wetland	Means a swamp, marsh, bog, fen, or other similar area that supports natural vegetation that is distinct from adjacent upland areas or enclosed uplands.
Unknown	

2.vii. Inflow (Temporary or Seasonal) (inflow_temporary_code)

Option	Description / definition
None	
Discharge Pipes	Any pipes used to facilitate the transfer of fluids from lands to a waterway. Flow may be seasonal, intermittent or regular uninterrupted.
Overland Flow	Water flow, such as runoff, not confined to a water channel or body.
Seasonal Creek	Creeks that flow throughout most of the year but may dry up during portions of the dry season.
Wetland	Means a swamp, marsh, bog, fen, or other similar area that supports natural vegetation that is distinct from adjacent upland areas or enclosed uplands.

Unknown	

2.viii. Outflow (Permanent/Seasonal) (outflow_code)

Option	Description / definition
None	
Creek	A stream, brook, or minor tributary of a river.
Culvert	A pipe, pipe arch, or log structure covered with soil and lying below the road surface, used to carry water from one side of the road to the other.
River	A naturally occurring watercourse that mostly has freshwater, and that eventually deposits into oceans, seas, or even other rivers. There are no official definitions for the generic term river as applied to geographic features, although sometimes defined as larger than a creek.
Tidal	A water current caused by the tides.
Wetland	Means a swamp, marsh, bog, fen, or other similar area that supports natural vegetation that is distinct from adjacent upland areas or enclosed uplands.
Unknown	

2.ix. Shoreline Types (shoreline_type_code)

Option	Description / definition
Boat Launch or Dock Infrastructure	Area used to launch, retrieve, or moor boats.
Fence	An artificial barrier to enclose an area, mark a boundary, control access or prevent escape.
Livestock Grazing Access	Land used for the purpose of livestock pasturage.
Riparian Vegetation	Natural vegetation growing adjacent to a stream, river, lake, or wetland that, due to the presence of water, is distinctly different from the vegetation of adjacent upland areas.
Riprap	Rocks, pieces of used concrete, or other material of various sizes placed firmly or loosely on riverbanks to prevent scouring by the river, or on slopes or road cuts to prevent erosion.
Road/Parking Lot	A designated and developed area of land used for the transportation or parking of vehicles by the general public.
Turf	Grass and the surface layer of earth held together by its roots.
Other	

2.x. Aquatic Invasive Plant Species (invasive_plant_aquatic_code)

Invasive Plant Code	Aquatic Invasive Plant Species
AB	American beachgrass (Ammophila breviligulata)
YC	Amphibious yellow cress (Rorippa amphibian)
RI	Bog bulrush / ricefield bulrush (Schoenoplectus mucronatus)
BO	Bohemian knotweed (Reynoutria / Fallopia x bohemica)
ED	Brazilian elodea (Egeria densa)
FC	Common frogbit (Hydrocharis morsus-range)
TC	Common tansy (Tanacetum vulgare)

NO	Common watercress (Nasturtium officinale)
UP	Curly leaf pondweed (Potamogeton crispus)
DC	Dense-flowered cordgrass (Spartina densiflora)
DO	Dodder (Cuscuta spp.)
EC	English cordgrass (Spartina anglica)
EW	Eurasian watermilfoil (Myriophyllum spicatum)
EB	European beachgrass (Ammophila arenaria)
RC	European common reed (Phragmites australis subsp. australis)
MQ	European water clover (Marsilea quadrifolia)
WE	European waterlily (Nymphaea alba)
FW	Fanwort (Cabomba caroliniana)
FM	Feathered mosquito-fern (Azolla pinnata)
FR	Flowering rush (Butomus umbellatus)
FL	Fragrant waterlily (Nymphaea odorata subsp. odorata)
GL	Garden yellow loosestrife (Lysimachia vulgaris)
GK	Giant knotweed (Reynoutria / Fallopia sachalinensis)
SW	Giant mannagrass (Glyceria maxima)
AD	Giant reed / giant cane (Arundo donax)
SV	Giant salvinia (Salvinia molesta)
PO	Himalayan knotweed (Persicaria wallichii / Polygonum polystachyum)
HY	Hydrilla (Hydrilla verticillata)
JK	Japanese knotweed (Reynoutria / Fallopia japonica)
GJ	Johnsongrass (Sorghum halepense)
LL	Large yellow / spotted loosestrife (Lysimachia punctata)
OW	Major oxygen weed (Lagarosiphon)
PF	Parrot's feather / Brazilian watermilfoil (Myriophyllum aquaticum)
IM	Policeman's helmet / himalayan balsam (Impatiens glandulifera)
PL	Purple loosestrife (Lythrum salicaria)
RE	Reed canarygrass (Phalaris arundinacea)
SN	Salt-meadow cordgrass (Spartina patens)
SA	Smooth cordgrass (Spartina alterniflora)
LM	Variable leaf milfoil (Myriophyllum heterophyllum)
WL	Wand loosestrife (Lythrum virgatum)
TN	Water chestnut (Trapa natans)
WH	Water hyacinth (Eichhornia crassipes)
LW	Water lettuce (Pistia stratiotes)
AQ	Water soldier (Stratiotes aloides)
YF	Yellow floating heart (Nymphoides peltata)
YI	Yellow iris (Iris pseudacorus)

3. Chemical Treatment (Terrestrial/Aquatic)

3.i. Pest Management Plan (pest_management_plan)

Drop Down Options
MOTI PMP 102-0671-21-26 [South Coastal Mainland of BC]
FLNR PMP 402-0680-20/25 [Central and Northern BC]
FLNR-PMP 402-0677-19/24 [South Coastal Region of BC]
FLNR-PMP 402-0678-19/24 [Southern Interior of BC]
BC HYDRO PMP 105-0985-21/26 [Facilities/Adjacent]
BC HYDRO PMP 105-0988-22/27 [ROWs/Corridors]
PMP Not required

3.ii. Wind Direction (wind_direction_code)

Option	Description / definition
No Wind	None present
North	360° aspect
North East	45° aspect
East	90° aspect
South East	135° aspect
South	180° aspect
South West	225° aspect
West	270° aspect
North West	315° aspect

3.iii. Chemical Application Method

Option	Description / definition
Back Pack	A portable, manually operated, low pressure container with a hose, wand and nozzle and a positive shut-off system used for the spot application of herbicides onto foliage, basal bark areas, or into or onto freshly cut stems and stumps.
Boomless Nozzle	Used with a truck or ATV mounted tank and fixed to the vehicle. Used where it is impractical to use a horizontal boom; unlike a flat fan nozzle these nozzles direct spray laterally to create a wide spray pattern that can be adjusted.
Fixed Boom	A fixed apparatus sprayer with multiple nozzles on single stretch of boom. Commonly used for applying herbicides in broadscale farming or fixed to an ATV or truck.
Hand gun	Hand-held spray gun with or without a wand, attached to a hose and tank which is mounted on a vehicle.
Stem Injection	A syringe-like device that delivers herbicide directly into the hollow-stemmed plant for translocation throughout the root system.
Basal Bark	Treatment for woody invasive plant control that involves spraying herbicide or herbicide mixture carried in oil onto the stem bases of the target plant to penetrate the relatively thin bark.
Cut and Insert	Treatment where the hollow-stemmed plant is cut between nodes and herbicide is injected into the remaining stem through the intact node junction.
Cut Stump/Cut and Paint	Stem is cut as close to the ground as possible, and herbicide is applied directly to the fresh cut area for absorption.
Wick	Absorbent pad, wicks or rope attached to a long-handled applicator or stick used to apply herbicides onto foliage, basal bark areas, or freshly cut stems or stumps.

3.iv. Liquid Herbicide Type (herbicide_code)

Drop Down Options
AM500a [2,4-D 2,4-D Amine 500] 14725
AM500b [2,4-D 2,4-D Amine 500] 9528
AM600a [2,4-D 2,4-D Amine 600] 5931
AM600b [2,4-D 2,4-D Amine 600] 14726
Arsenal [imazapyr] 23713
Aspect [picloram/2,4-D] 31641
Banvel II [dicamba] 23957
BanvelVM [dicamba] 29249
BioLink [Caprylic Acid/Capric Acid] 33590
Credit Xtreme [glyphosate] 29888
Dyvel DSP [dicamba/2,4-D/mecoprop-p] 27856
Garlon4 [triclopyr] 21053
GarlonRTU [triclopyr] 29334
GarlonXRT [triclopyr] 28945
Grazon [2,4-D] 27634
GrazonXC [picloram] 31642
Habitat Aqua [imazapyr] 32374
Kerb SC [Propyzamide] 30264
Killex [2,4-D/mecoprop-p/dicamba] 27801
Lontrel360 [clopyralid] 23545
Method240SL [aminocyclopyrachlor] 32957
Milestone [aminopyralid] 28517
Oracle [dicamba] 26722
ParIII [mecoprop-p/2,4-D/dicamba] 27884
Arsenal Powerline [imazapyr] 30203
Reclaim II B [2,4-D] 30063
RestoreA [Aminopyralid] 28551
RestoreB [2,4-D] 28552
Reward [diquat] 26271
Roundup Super Concentrate [glyphosate] 22759
Roundup Transorb [glyphosate] 28198
Roundup Weathermax [glyohsate] 27487
Roundup WeatherPro [glyphosate] 33653
StartUp [glyphosate] 29498
Tordon101 [picloram] 9007
Tordon22K [picloram] 9005
Trillion [2,4-D/mecoprop-p/dicamba] 27972
Vanquish [dicamba] 26980
Vantage Plus Max [glypohsate] 27615
VantageXRT [glyphosate] 29994

VP480 [glyphosate] 28840

3.v. Granular Herbicide Types (herbicide_code)

Drop Down Options
Clearview [aminopyralid/metsulfuron-methyl] 29752
Escort [metsulfuron methyl] 23005
LongRun [flazasulfuron] 33128
Method50SG [aminocyclopyrachlor] 30917
NaviusVM [metsulfuron-methyl/Aminocyclopyrachlor] 31382
Navius Flex [metsulfuron-methyl/aminocyclopyrachlor] 30922
Overdrive [diflufenzopyr] 30065
Reclaim II A [aminopyralid/metsulfuron-methyl] 30062
Sandea [halosulfuron] 31209
Torpedo [flumioxazin and pyroxasulfone] 31559
Truvist [chlorsulfuron/aminocyclopyrachlor] 30920

3.vi. Precautionary Statement (precautionary_statement_code)

Option	Description / definition
No entry for 2 weeks	Use when the herbicide label indicates no entry into the treated area for 2 weeks
No entry until herbicide is dry	Use when the herbicide label indicates no entry into the treated area until the herbicide has dried on the plants.
Irrigation Restrictions	Use when the herbicide label indicates that there are restrictions on irrigation of the treated area.
More information in comments	Include any other restrictions or cautions pertinent to the treatment location as indicated on the herbicide label.

3. vii. Chemical Treatment Acceptable Scenarios and Calculations

Acceptable Scenarios of Application for Treating with Herbicides

Application Method	Herbicide type	Number of herbicides	Calculation type	Application Rate Format	Number of Invasive Plants
Spray[1]	Liquid	1	Product Application Rate	Liters/hectare	1, 2 or 3
Spray	Liquid	1	Dilution	Percent (%)	1, 2 or 3
Spray	Granular	1	Product Application Rate	Grams/hectare	1, 2 or 3
Spray	Liquid and/or Granular	2 or 3 (Tank Mix)	Product Application Rate	Liters/hectare and/or Grams/hectare	1, 2 or 3
Direct[2]	Liquid	1	Dilution	Percent (%)	1

[1]Spray Methods: Fixed Boom, Hand gun, Back Pack, Boomless nozzle
[2]Direct treatment methods: Wick, Stem Injection, Cut & Insert, Basal Bark, Cut Stem

Calculations used in InvasivesBC

For Liquid Herbicides and Product Application Rate

Information Provided:

- Area (m^2) – from map Geometry
- Product Application Rate (l/ha
- Amount of Mix Used (l)
- Delivery Rate (l/ha)

Area Treated (ha) = Amount of Mix used (l) / Delivery Rate (l/ha)
Area Treated (m^2) = Area Treated X 10,000
Percent Area Covered (%) = Area Treated (m^2) / Geometry (m^2) X 100
Amount of Undiluted Herbicide used (l) = Dilution (%) /100 X Amount of Mix Used (l)
Dilution = Product Application Rate (l/ha) / Delivery Rate (l/ha) X 100

For Liquid Herbicides and Dilution %

Information Provided:

- Area (m^2) – from map Geometry
- Amount of Mix Used
- Dilution Percent of the Mix Used
- Area Treated (m^2)

Area Treated (ha) = Area Treated (m^2) /10,000
Percent Area treated (%) = Area Treated (m^2) / Area (m^2)
Amount of Undiluted Herbicide Used (l) = Dilution (%) /100 X Amount of Mix Used (l)

For Granular Herbicides and Product Application Rate

Information Provided:

- Area (m^2) – from map Geometry
- Product Application Rate (g/ha)
- Amount of Mix Used l/ha
- Delivery Rate (l/ha)

Product Application Rate (l/ha) = Product Application rate (g/ha) /1,000
Area Treated (ha) = Amount of Mix used (l) / Delivery Rate (l/ha)
Area Treated (m^2) = Area Treated X 10,000
Percent Area Covered (%) = Area Treated (m^2) / Geometry (m^2) X 100
Amount of Undiluted Herbicide used (l) = Dilution (%) /100 X Amount of Mix Used (l)
Note: the amount of undiluted herbicide calculated from granular herbicides is in GRAMS
Dilution = Product Application Rate (l/ha) / Delivery Rate (l/ha) X 100

4. Mechanical Treatments (Terrestrial/Aquatic)

4.i. Mechanical Method (mechanical_method_code)

Method	Description / definition
Digging	Excavation of the invasive plant(s) by manual tool or heavy equipment.
Bury	Cover with material, to such a depth that growth will not remerge.
Controlled Burning	Planned fire in a prescribed area for the control and management of target invasive plants, scheduled for a time when the fire will not pose a threat to the surrounding area.
Cultivation or till	Breaking up of the soil and existing plants to prepare for planting of a planned species, or combination of species.
Cutting	Removal of most of the plant with a blade.
Dead-heading	Removal of the flowers or seed heads.
Flaming / Tiger Torch burn	Use of a tiger torch, or other device, for targeted burning of an invasive plant(s).
Hand pulling	Manual removal with no tools.

Hot water / Steam	Application of hot water or steam to the plant to damage or kill the above ground parts of the plant, roots are not as effectively attacked.
Mowing	Cutting the above ground growth of a plant with a mechanical device such as a weed whacker, hedge trimmer, lawn mower or industrial mower.
Mulching/Sheet mulching	Applying a mulch layer, an organic composition, over the target area of invasive plant(s) to restrict or prevent growth.
Suction dredging	Aquatic use of a suction device to excavate invasive plant material, and potentially surrounding substrate, for the removal of the target species.
Tarping/Smothering	Applying a material cover, such as cardboard or plywood, to cover a target area of invasive plant(s) to restrict or prevent growth.
Salt water / Vinegar	Application of salt water or vinegar solutions to effect soil salinity outside the range of an invasive plant's tolerance level.
Targeted grazing	Use of livestock, such as goats, in a targeted area for vegetative management of invasive plant species.
Seeding	Application of a selected seed variety, or combination, at an appropriate time for the seed to germinate and limit invasive plant(s) growth through competition or rehabilitation of a site.
Planting	Placement of selected plant species in an area for the purpose of preventing invasive plant(s) growth through competition or for site rehabilitation purposes.
Mechanical Method not listed	A method not listed in the drop-down menu. Include details in the Comments.

4.ii. Disposal Method (mechanical_disposal_code)

Method	Description / definition
In Situ	Material was disposed of at the same location from where it was removed.
Dry and Passive Compost	Use of an organic material pile for the decomposition of material.
Industrial Compost	Use of a facility for decomposition of material.
Burned	Use of controlled fire for the disposal of material.
Industrial Incineration	Use of an incineration facility.
Landfill Regular	Material, double bagged, disposed of in the directed landfill destination.
Landfill Deep Burial	Material buried at the landfill, contact landfill to pre-arrange disposal.
N/A	

5. Biocontrol Codes and Definitions

5.i. Cloud Cover

Drop Down Options
0 Oktas - Clear Sky
1 Oktas - Few 15% clouds
2 Oktas - Few 20-30% clouds
3 Oktas - Scattered 40% clouds
4 Oktas - Scattered 50% clouds

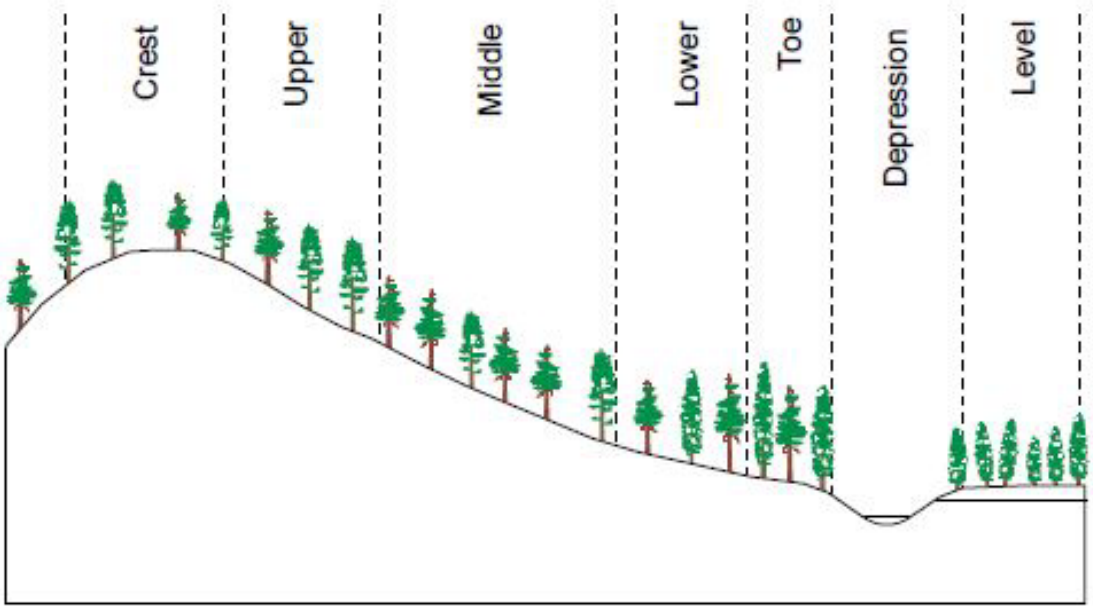
5 Oktas - Broken 50% clouds
6 Oktas - Broken 60-70% clouds
7 Oktas - Broken 90% clouds
8 Oktas - Overcast 100% clouds
9 – Obscured (e.g. smoke)

5.ii. Precipitation

Drop Down Options	Description / definition
No precipitation	No precipitation current or recent precipitation detected.
Unknown or indeterminant	Unknown if precipitation has occurred.
Down pour	Precipitation in the form of hard rain
Drizzle	Precipitation in the form of fine mist-like rain
Hail	Precipitation in the form of small balls or lumps usually consisting of concentric layers of clear ice and compact snow
Intermittent showers	Precipitation heavier than a drizzle and lighter than a down pour with intermittent breaks
Residual wet	Moisture of some significance maintained on the plants' foliage. It may include overnight dew or residual wet from an overnight or recent rainfall
Snow	Precipitation in the form of small white ice crystals
Steady rain	Precipitation heavier than a drizzle and lighter than a down pour with no intermittent breaks

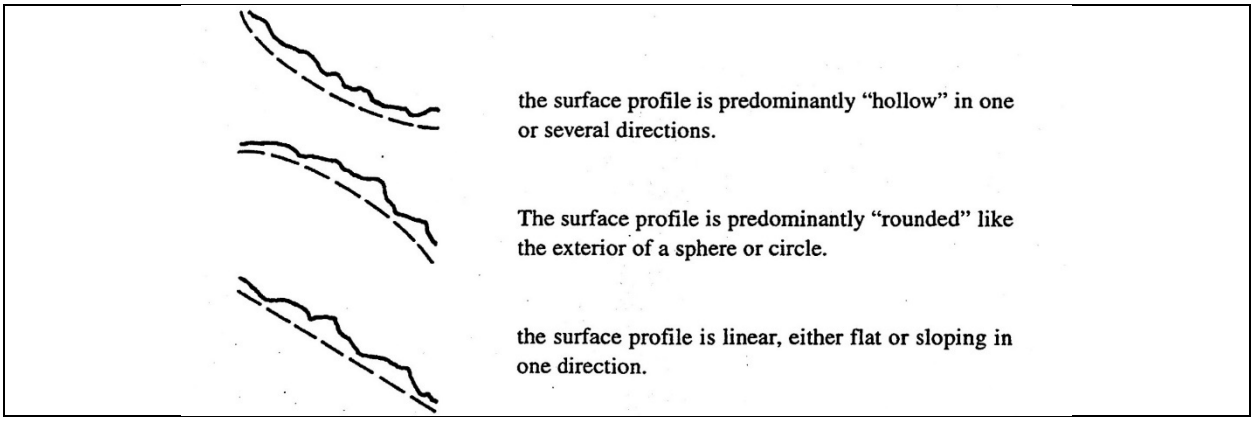
5.iii. Mesoslope Position

Drop Down Options	Description / definition
Unknown or indeterminant	Position is not possible to describe.
Crest	The generally convex uppermost portion of a hill; usually convex in all directions with no distinct aspect.
Upper slope	The generally convex upper portion of the slope immediately below the crest of a hill; has a specific aspect.
Middle slope	Area between the upper and lower slope; the surface profile is neither distinctly concave nor convex; has a straight or somewhat sigmoid surface profile with a specific aspect.
Lower slope	The area towards the base of a slope; generally has a concave surface profile with a specific aspect.
Toe	The area demarcated from the lower slope by an abrupt decrease in slope gradient; seepage is typically present.
Depression	Any area concave in all directions; may be at the base of a mesoscale slope or in a generally level area.
Level	Any level meso-scale area not immediately adjacent to a meso-scale slope; the surface profile is generally horizontal and straight with no significant aspect.
Gully	An area in a double toe slop position where the receiving area is also sloped (perpendicular to the toe slopes).



5.iv. Site Surface Shape

Drop Down Option	Description / definition
Unknown or indeterminant	Unable to define the surface profile.
Hollow	The surface profile is predominantly “hollow” in one of several directions.
Rounded	The surface profile is predominantly “rounded” like the exterior of a sphere or circle.
Linear	The surface profile is linear, either flat or sloping in one direction.



5.v. Biocontrol Agents

Code	Biocontrol Agent (Latin name)
ACERGEN	Aceria genistae

ACERMAL	Aceria malherbae (Nuzzaci)
AGAPZOE	Agapeta zoegana (L.)
AGONNER	Agonopterix nervosa
AGRIHYP	Agrilus hyperici (Creutzer)
ALTICAR	Altica carduorum
APHAITA	Aphalara itadori
APHICHL	Aphis chloris (Koch)
APHTCYP	Aphthona cyparissiae (Koch)
APHTCZW	Aphthona czwalinae (Weise)
APHTFLA	Aphthona flava (Guill.)
APHTLAC	Aphthona lacertosa (Rosh.)
APHTNIG	Aphthona nigriscutis (Foudras)
APHTSPP	Apthona speices
APLOPLA	Aplocera plagiata (L.)
AULAACR	Aulacidea acroptilonica
AULASUB	Aulacidea subterminalis
BOTASEN	Botanophila seneciella
BRACPUL	Brachypterolus pulicarius (L.)
BRADGIL	Bradyrrhoa gilveolella
BRUCVIL	Bruchidius villosus
CALOLUN	Calophasia lunula (Hufn.)
CASSRUB	Cassida rubiginosa
CHAEACR	Chaetorellia acrolophi White & Marq.
CHARSEX	Charidotella sexpunctata bicolor
CHEIURB	Cheilosia urbana
CHRYHYP	Chrysolina hyperici (Forster)
CHRYQUA	Chrysolina quadrigemina (Suffrain)
CHRYSPP	Chrysolina species
CHRYVAR	Chrysolina varians
COCHATR	Cochylis atricapitana (Stephens)
CYPHACH	Cyphocleonus achates (Fahr)
CYSTSCH	Cystiphora schmidti
CYSTSON	Cystophora sonchi
DELOGUT	Deloyala guttata
ACERCHO	Aceria chondrillae/Eriophyes chondrillae
ETEOINT	Eteobalea intermediella (Riedl)
ETEOSER	Eteobalea serratella (Treit.)
EXAPFUS	Exapion fuscirostre
GALECAL	Galerucella calmariensis (Linne)
GALEPUS	Galerucella pusilla
HADRLIT	Hadroplontus litura
HYLEEUP	Hyles euphorbiae (L.)
HYLOTRA	Hylobius transversovittatus

LARIMIN	Larinus minutus Gyll.
LARIOBT	Larinus obtusus Gyll.
LARICAR	Larinus carlinae/Larinus planus
LARISPP	Larinus species
LOBEEUP	Lobesia euphorbiana (Freyer)
LONGFLA	Longitarsus flavicornis (Steph.)
LONGGRA	Longitarsus gracilis
LONGJAC	Longitarsus jacobaeae (Waterhouse)
LONGJAS	Longitarsus jacobaeae (Swiss)
LONGQUA	Longitarsus quadriguttatus (Pont.)
MECIJAN	Mecinus janthinus (Germar)
METZLAP	Metzneria lappella
METZPAU	Metzneria paucipunctella (Zellar)
MICREDE	Microplontus edentulus
MICRLAR	Microlarinus lareynii
MINOMUR	Minoa murinata (Scop.)
MOGUCRU	Mogulones cruciger (Hbst.)
OMPHHOO	Omphalapion hookeri
PELOMED	Pelochrista medullana (Strig.)
PTERINS	Pterolonche inspersa (Strig.)
PUCCACR	Puccinia acroptili (P. & H. Syd)
PUCCCAR	Puccinia carduorum
PUCCCHO	Puccinia chondrillina
PUCCJAC	Puccinia jaceae (Otth.)
PUCCPUN	Puccinia punctiformis
RHINANT	Rhinusa antirrhini
RHINCON	Rhinocyllus conicus (Froelich)
RHINLIN	Rhinusa linariae
RHINNET	Rhinusa neta
RHINPIL	Rhinusa pilosa
RHINTET	Rhinusa tetrum
RHOPTRI	Rhopalomyia tripleurospermi
SCLESCL	Sclerotinia sclerotium
SPHEJUG	Sphenoptera jugoslavica (Obend.)
SPURESU	Spurgia esula (Gagne)
SUBAPIC	Subanguina picridis
TERERUF	Terellia ruficauda
TEREVIR	Terellia virens (Loew.)
TRICHOR	Trichosirocalus horridus (Panzer)
TYRIJAC	Tyria jacobeae (L.)
UROPAFF	Urophora affinis (Frauenfeld)
UROPCAR	Urophora cardui (F).
UROPJAC	Urophora jaceana

UROPQUA	Urophora quadrifasciata (Meigan)
UROPSOL	Urophora solstitialus (L.)
UROPSPP	Urophora species
UROPSTY	Urophora stylata (L.)
ZEUXGIA	Zeuxidiplosis giardi

5.vi. Collection Method (biocontrol_monitoring_methods_code) / (monitoring_type_code)

Drop Down Options	Description / definition
Aspirate	Use of aspirator vacuum to collect agent(s).
Hand pick	Collector manually gathers agent(s).
Clipping	Section of plant where agent(s) is located is cut and gathered for the agent to exit at the new location.
Sweep (counted)	Use of sweep net for a determined number of sweeps.
Sweep (timed)	Use of sweep net for a determined interval of time.
Tap and Tray	Agent(s) are pushed off plant onto a tray for collection.
Transplant	Collection of agent-infested whole plants or root/stolon fragments so the infested whole plant or a plant growing from the root fragment live at the new location.

5.vii. Sign of Agent Presence via Evidence (biological_agent_presence_code)

Drop Down Options	Description / definition
Unknown	
Exit holes / tunnels	Agent presence (evidence) - Exit holes created by adults when they emerge from their pupating location such as holes created by *Larinus minutus* in knapweed seedheads or holes created by *Mecinus janthinus* on toadflax stems.
Feeding	Agent presence (evidence) - Obvious biocontrol agent feeding evidence such as *Longitarsus quadriguttatus* shot hole feeding on hound's-tongue, *Calophasia lunula* defoliation on toadflax or *Bruchidius villosus* feeding trail on Scotch broom seed pods.
Foliar Feeding Damage	Agent presence (evidence) - evidence of feeding of the invasive plant flowers found that is typical of the target biocontrol agent(s)
Seed Feeding Damage	Agent presence (evidence) - - evidence of feeding of the invasive plant seeds or seed head found that is typical of the target biocontrol agent(s)
Root Feeding Damage	Agent presence (evidence) - evidence of feeding of the invasive plant roots found that is typical of the target biocontrol agent(s)
Stem Feeding Damage	Agent presence (evidence) - evidence of feeding of the invasive plant stems found that is typical of the target biocontrol agent(s)
Eggs present	Agent presence (evidence) – biocontrol agent eggs are located on any part of the target invasive plant
Larva(e) present	Agent presence (evidence) – biocontrol agent larva are located on any part of the target invasive plant or surrounding soil.
Pupa(e) present	Agent presence (evidence) - biocontrol agent pupa(e) are located on any part of the target invasive plant or surrounding soil.
Adults present	Agent presence (evidence) - biocontrol agent adults are located on any part of the target invasive plant or surrounding soil.
Frass	Agent presence (evidence) - Obvious biocontrol agent frass (insect feces) such as *Hyles euphorbiana* frass found on leafy spurge plants. Frass may also be used in conjunction with Feeding evidence such as *Cyphocleonus achates* feeding on plant roots and frass found in the feeding cavity.
Gall (in gall)	Agent presence (evidence) – Plants develop galls as a response to injury (typically feeding). Specific feeding locations by different biocontrol agent species will result in galls on specific parts of the plant with the agent found within. Opening the gall will kill larvae and pupae inside. *Urophora cardui* feeding results in galls on the stems of Canada thistle.
Oviposition marks	Agent presence (evidence) – Often eggs cannot be seen but the oviposition marks are observed such as *Mogulones crucifer's* blister-like formation on hound's-tongue leaf petioles or *Larinus planus'* blackened dimples on Canada thistle floral heads.
Current year evidence	Agent presence (evidence) - Distinguish evidence between current year and previous year(s) plants. Used in conjunction with other presence categories.
Previous year evidence	

5.viii. Agent Life Cycle Stage (biological_agent_stage_code)

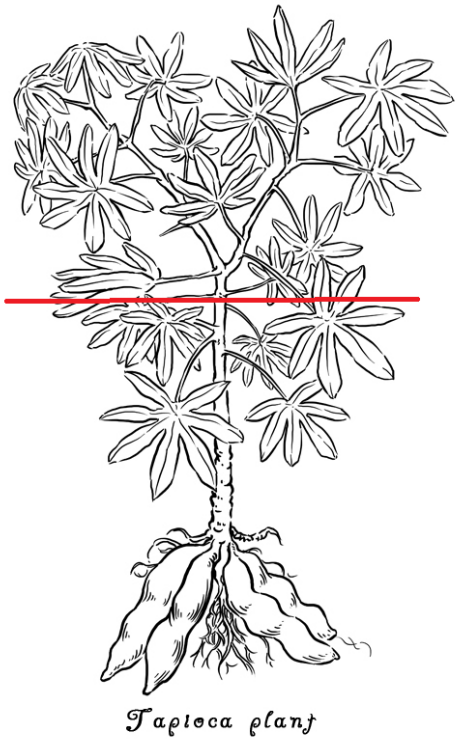
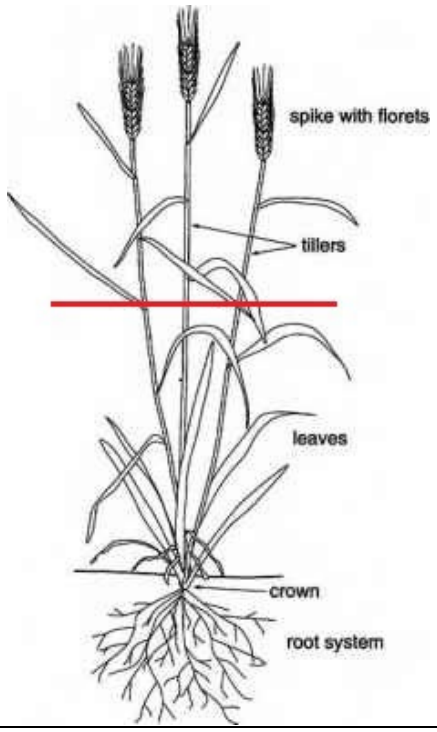
Drop Down Options	Description / definition
Unknown	Life stage cannot be distinguished.
Adult	All adult stages.
Egg	Egg or egg clusters.
Pupa	Pupa stage either within a pupal chamber, chrysalis or without any protection.
Larva	All larva stages (instars) including the mature larva stage just prior to pupation. If the larva appears to have taken on the early pupa form and it has a shape similar to the adult form it is considered a pupa, not a larva.
Nymph	An immature form of some invertebrate insects, undergoing gradual metamorphosis before reaching the adult stage. The overall form resembles that of the adult stage, except for lack of wings.
Dead	Dead agent. Some species, such as weevils, will feign death. The legs of dead insects will often be in disarray while insects feigning death will have their legs tucked tightly close to their bodies - rest the insect on your open palm for a time and they will often 'revive'.
Other	Life stage is different than any stages in this list.
All	Multiple life stages within this list. Some short-lived biocontrol agents have multiple generations per year and their lifecycle stages overlap such as those that have nymph or juvenile stages such as aphids, nematodes and mites.

5.ix. Location agent(s) found (location_agents_found_code)

Drop Down Options	Description / definition
Base of Slope	Or 'Toe' of slope - The area demarcated from the lower slope by an abrupt decrease in slope gradient; seepage is typically present.
Centre of Patch	Center point of entire patch/infestation of the target invasive plant.
Edge Effects	Edge of a single patch of the target invasive plant.
Edge of Patch	Edge of the infestation (defined patch on the landscape) of the target invasive plant.
In Hollow	Or 'Hollow' – The surface profile is predominantly 'Hollow' in one or several directions.
In Protected	Location protected from the natural elements such as wind, rain.
Mid-Slope	Or 'Middle slope' - Area between the upper and lower slope; the surface profile is neither distinctly concave nor convex; has a straight or somewhat sigmoid surface profile with a specific aspect.
No Slope	Or "Level' - Any level meso-scale area not immediately adjacent to a meso-scale slope; the surface profile is generally horizontal and straight with no significant aspect.
Saturated Soil	Soil is visibly wet on the surface and contains moisture in the voids/cracks. Pressure on the surface causes the release of water.
Shaded	Area blocked from the sun.
Top of Slope	Includes either of the 'Crest' (the generally convex uppermost portion of a hill; usually convex in all directions with no distinct aspect) Or 'Upper slope' (the generally convex upper portion of the slope immediately below the crest of a hill; has a specific aspect) features.
Within Canopy	Beneath tree crowns.

5.x. Plant Position – **used to identify the overall general location of the biocontrol agent and used in combination with Appendix 5.ix. Location agent(s) found** (plant_position_code)

Drop Down Options	Description / definition
Basal growth	Vegetative leaves growing at the base of a plant that is bolting or has already bolted. This also includes any spring basal leaves as well as basal regeneration growth that some plants establish well into the growing season or as a result of injury.
Plant upper	Visually divide the plant into upper and lower halves (see image below) and determine if the biocontrol agent is on the upper half which includes:

	• The uppermost terminal; • Any parts of lateral branching growth that originate within the lower half but extend upward into the upper half; and • Does not include parts of lateral branching growth that originate within the upper half but fall downward into the lower half) or lower half of the plant.
Plant lower	Visually divide the plant into upper and lower halves (see image below) and determine if the biocontrol agent is on the lower half of the plant which includes: • Any parts of lateral branching growth that originate within the upper half but fall downward into the lower half; • Does not include: rosettes, roots, or any parts of lateral branching growth that originate within the lower half but extend upward into the upper half.
Rosette	Lower rosette leaves of a plant that has not yet bolted.
Root	Includes all rooting sections that naturally grow beneath the soil level.
On soil	Anywhere on the soil surface.
In soil	Anywhere in the soil and below the soil surface. This includes even the thinnest layer of soil.
Duff/Litter	Anywhere in duff or litter layer above the soil including elevated litter accumulations found on surfaces other than soil.
Tent	Anywhere on a propagation tent
Other	Any other location such as other plants, structures, etc.
	 

5.xi. Agent Location – **used to identify the precise location of the biocontrol agent within the 5.x. Plant Position**

(agent_location_code)

Drop Down Options	Description / definition
Axil	Angled area between the stem and the leaf petiole.
Basal growth	Any vegetative growth rising or regenerating from the plant base. This includes fall and spring growth (carbohydrate growth) that develops for plant nourishment and later withers in late spring or summer).
Flower (internal)	Entire internal flower area including internal reproductive parts and the entire floral bud area. This does not pertain to biocontrol agents partially submerged within floral parts such as those that may be ovipositing, feeding, or seeking refuge.

Drop Down Options	Description / definition
Flower (external)	Entire outer area of the flower head including the bracts and petals. This also includes the external reproductive parts.
Seedhead (internal)	Entire internal seedhead including the seeds. For this purpose, a seedhead is defined as the stage when flower parts have dropped or withered to the point that the floral/seedhead structure appears to be developing seeds. This does not pertain to biocontrol agents partially submerged within floral parts such as those that may be ovipositing, feeding, or seeking refuge.
Seedhead (external)	Entire outer seedhead surface including bracts and modified bracts (spines, etc.). For this purpose a seedhead is defined as the stage when the flower parts have dropped or withered to the point that the floral/seedhead structure appears to be developing seeds.
Leaf surface (upper side)	➢ Entire top side of a leaf. This includes all leaves including any parts of a compound leaf or modified leaves such as thorns/spines, needles, etc.
Leaf underside	Entire underside of a leaf. This includes all leaves including any parts of a compound leaf or modified leaves such as thorns/spines, needles, etc.
Meristem (meristematic tissue)	Region where new plant growth arises from near the base of the plant, crown/center on a rosette.
Root (internal)	Inside of the root or root area or core including the root hairs, underground rhizomes, and the inner area of the root crown area, but does not include above ground stolons or runners.
Root (external)	Outer root surface including the root hairs, underground rhizomes and the outer root crown area, but does not include above ground stolons or runners.
Stem/stalk (internal)	Entire internal area of any stem including the main stem or lateral stems. This applies to all plant growth habits such as those growing upright, prostrate, or cascading.
Stem/stalk (external)	Entire outside area of stems including the main stem or lateral stems. This applies to all plant growth habits such as those growing upright, prostrate, or cascading.
Stolon/runner	Entire area of the above ground parts of a stolon or runner. A stolon or runner remains part of the parent plant until it develops roots and has planted itself into the soil. If the roots are visible but are not planted into the soil it is still considered a stolon.
Plant terminal	Terminal area of the plant, typically the highest point of the plant however it may also include terminals that have been stunted on multi-stem plants or terminal points on some lateral growing stems positioned in the plant lower.

5.xii. Plant Phenology

Drop Down Options	Description / definition
Winter Dormant	
Bolting	Plant starting to bolt, including the earliest visible bolt development that may be less than a cm is considered a bolt.
Flowering	After the first floral bud starts to break bloom and show the plant's true flower colour.
Rosettes	Plant with only basal leaves present, no bolting stems. Small rosettes are identified from seedlings by the presence of true leaves. This does not include regenerating basal growth found on plants that have already bolted.
Senescent	Plant in most advanced stage before winter dormancy or when a plant diapauses for a temporary length of time, typically during the heat of summer.
Seedlings	Identified by the absence of true leaves.
Seeds forming	Typically, defined as after the flower has faded, petals are withered or dropped and seeds are forming in any stage including soft seed through to ripe (hard) seed.

5.xiii. Monitoring Methods

Drop Down Options	Description / definition
Clipping (Timed or count)	Clip a specified number of plant parts (count) including stems, leaves, and seedheads to dissect or keep in a container for the agents to emerge on their own, or continue clipping for a recorded number of minutes (timed).

Excavate (count only)	Excavate specified number of plant roots and examine for biocontrol agent presence by gently scraping exterior and/or dissecting.
Observe (timed or plant count)	Observe a specified quantity of plants for agents or observe for biocontrol agents over a specified period of time (in minutes).
Sweep (timed or count)	Count sweeps with a sweepnet where the swing of the net in one direction is equal to one sweep. Time sweeps with a sweepnet, where time is used to measure the Monitor Quantity. Time taken to aspirate and / or count the agents from the sweepnet should not be included in the Monitor Quantity time.
Tap and Tray (timed or count)	Count the number of plants that are tapped/beat with a stick to promote the biocontrol agent to drop onto a drop cloth or a tray. For example, repeatedly tapping a single shrub with a stick over a collection cloth or tray would be considered as one count.

5.xiv. Dispersal/Spread Monitoring

Methodology Details				
Start m from release point (meters)	_____m	**Max Monitoring Distance (meters)**	_____m	**Methodology Description (e.g. distance allowance (m) between intervals):**
Data Summary / Calculations				
Max. spread distance (meters) & aspect	_____ m @ _____ o			
Agent Density (total # agents found on the plants monitored divided by total # plants monitored) x 100 (or sweep, etc.)	_____ %			
Plant Attack (total # agents found on the plants monitored divided by total # plants monitored that had agents) x 100 (or swept, etc.)	_____ %			
General comments & observations:				
Sketch layout of spread sampling transects. Include UTMs of each transect start (if applicable).				

Spread Monitoring Data Results

Aspect _____ o	Sampler	Aspect _____ o	Sampler	Aspect _____ o	Sampler	Aspect _____ o	Sampler
Location (m)	**Quantity**	**Location (m)**	**Quantity**	**Location (m)**	**Quantity**	**Location (m)**	**Quantity**

Sub Total		**Sub total**		**Sub total**		**Sub total**	

5.xv Invasive Plants with Biocontrol (invasive_plant_code_withbiocontrol)

Invasive Plant Code	Invasive Plant list with biocontrol agents available
BL	Black knapweed (CENT NIG Centaurea nigra)
BO	Bohemian knotweed (FALL BOH Fallopia x bohemicum)
BK	Brown knapweed (CENT JAC Centaurea jacea)
BT	Bull thistle (CIRS VUL Cirsium vulgare)
BU	Common burdock (ARCT MIN Arctium minus)
CT	Canada thistle (CIRS ARV Cirsium arvense)
CS	Cypress spurge (EUPH CYP Euphorbia cyparissias)
DT	Dalmatian toadflax (LINA DAL Linaria dalmatica)
DK	Diffuse knapweed (CENT DIF Centaurea diffusa)
FB	Field bindweed (CONV ARV Convolvulus arvensis)
FR	Flowering rush (BUTO UMB Butomus umbellatus)
AP	Garlic mustard (ALLI PET Alliaria petiolata)
GB	Great burdock (ARCT LAP Arctium lappa)
GO	Gorse (ULEX EUR Ulex europaeus)
BI	Hedge false bindweed (CALY SEP Calystegia sepium)
HT	Hound's-tongue (CYNO OFF Cynoglossum officinale)
JK	Japanese knotweed (FALL JAP Fallopia japonica)
KH	King devil hawkweed (HIER FLO Hieracium floribundum)
LS	Leafy spurge (EUPH ESU Euphorbia esula)
MT	Marsh plume thistle/Marsh thistle (CIRS PAL Cirsium palustre)
MH	Meadow hawkweed (HIER CAE Hieracium caespitosum)
MK	Meadow knapweed (CENT DEB Centaurea debeauxii)
ME	Mouse ear hawkweed (HIER PIL Hieracium pilosella)
MU	Mullein (VERB THA Verbascum thapsis)
NT	Nodding thistle (CARD NUT Carduus nutans)
OH	Orange hawkweed (HIER AUR Hieracium aurantiacum)
OD	Oxeye daisy (LEUC VUL Leucanthemum vulgare)
PS	Perennial sow thistle (SONC ARV Sonchus arvensis)
PT	Plumeless thistle (CARD ACA Carduus acanthoides)
PV	Puncturevine (TRIB TER Tribulus terrestris)
PL	Purple loosestrife (LYTH SAL Lythrum salicaria)
RK	Russian knapweed (ACRO REP Acroptilon repens)
RO	Russian olive (ELAE ANG Elaeagnus angustifolia)
RS	Rush skeletonweed (CHON JUN Chondrilla juncea)
SH	Scentless chamomile (MATR PER Matricaria perforata)
SB	Scotch broom (CYTI SCO Cytisus scoparius)
CN	Short-fringed knapweed (CENT NIR Centaurea nigrescens)
SK	Spotted knapweed (CENT BIE Centaurea biebersteinii)

SJ	St. John's wort/Saint John's wort/ Goatweed (HYPE PER Hypericum perforatum)
TR	Tansy ragwort (SENE JAC Senecio jacobaea)
WP	Whiplash hawkweed (HIER FLA Hieracium flagellare)
YT	Yellow/common toadflax (LINA VUL Linaria vulgaris)

6. Monitoring (Terrestrial/Aquatic)

6.i Treatment Efficacy Rating (efficacy_code)

Drop Down Options
0 – 9%
10 – 19%
20 – 29%
30 – 39%
40 – 49%
50 – 59%
60 – 69%
70 – 79%
80 – 89%
90 – 100%

6.ii Management Efficacy Rating (management_efficacy_code)

Drop Down Options
1 0 – 19%
2 20 – 29%
3 30 – 39%
4 40 – 49%
5 50 – 59%
6 60 - 69%
7 70 – 79%
8 80 – 89%
9 90 – 99%
10 100%

6.iii Invasive Plants on Site (monitoring_evidence_code)

Option	Description / definition
Not Applicable	N/A (no remaining plants on site).
Regrowth	Treated plants that are regrowing from the root/rhizome or rosette of an established plant (not new seedlings).
New Seedlings/Rosettes	Newly sprouted plant from seed since the time of treatment.

Skeletons with seeds	The remaining structure of dead or dormant plants that have retained their seeds on the plants.
Skeletons without seeds	The remaining structure of dead or dormant plants with no seeds attached.
Large areas untreated	Indicates when there are both treated and a significant area of untreated plants within an infestation.
Few scattered untreated plants	Indicates when the majority of plants in an infestation are treated but a small amount (less than 15%) is untreated.

6.iv Treatment Pass (treatment_pass_code)

Option	Description / definition
First	First treatment of the season
Second	Second treatment of the season
Third	Third treatment of the season
Unknown	Use when the treatment pass is unknown.