

Welcome to the Alaska Exotic Plant Management Team Data Collection Protocol for 2006!

Last Modified
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General File Management.....	2
Trimble GPS Units.....	4
GPS Data.....	4
GPS Transfers	4
GPS Settings	4
GPS Background Images	5
Data Fields	6
Collecting Data - Point, Line, or Polygons?	10
General Tips for Using the GPS	11
Monitoring	12
Navigating to Previously Recorded Polygons	13
GPS Data File Management.....	13
Selecting a Project.....	13
Transferring Rover Files	14
Differentially Correcting Rover Files	15
Editing Files	17
Keeping Track of your Hours	18
Photo Management	19
Taking Photos	20
Managing Photos	21
Voucher Specimens	21
What to Collect	21
How to Collect	21
Phenology Log.....	23
Seasonal Report	23

This document will guide you through the process of exotic plant management data collection using Trimble GPS units and a customized Data Dictionary. It is also intended to maintain high standards of quality in the data that we collect and consistency among observers. If you have any questions about what is written here, please do not hesitate to contact Jeff Heys (907-644-3451 or Jeff_Heys@nps.gov) or Whitney Rapp (907-697-2603 or Whitney_Rapp@nps.gov).

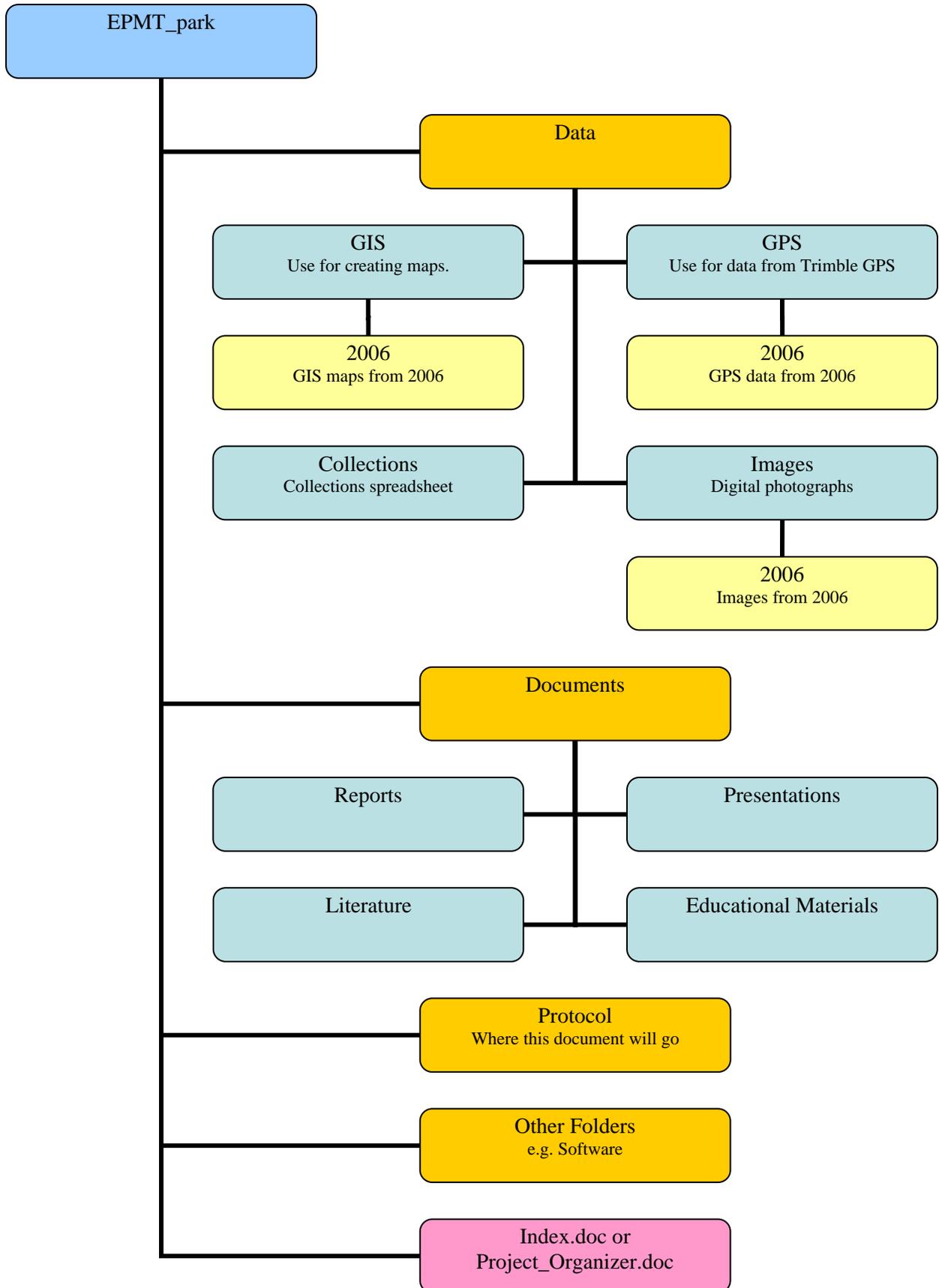
The protocol itself is a GPS-based method to map exotic plant infestations and uninfested areas and collect relevant information about them. The data will become part of a database that spans multiple years of data collection from across the Alaska Region of the NPS. It will also be incorporated into a statewide database that has been developed to track exotic plant distributions across jurisdictional boundaries.

General File Management

In an effort to organize data that works well for each team and future users of the files, a suggested file structure is described.

1. In collaboration with your supervisor or IT staff, identify the appropriate place to store your data at your park that is accessible by you, secure, and routinely backed up. This may be on your local machine (C:\) or on a network drive.
2. Create a folder (such as EPMT_(park code)) in this location that will contain ALL of your data, documents, etc. Within this folder, tiers of subfolders can be created.
3. The suggested file structure is diagramed below with each balloon representing a folder. This is definitely not exhaustive of the possibilities, but it is a framework to organize files, is adaptable for many years, and will be useful for others.
4. In the root folder, create an index document (index.doc or Project_Organizer.doc) in Word that directs people to the various files within the folders. Using hyperlinks will further facilitate others to find relevant information quickly.

***** All GPS data, photos, rover file status, and time record** should be edited and updated to the [regional drive](#) by the end of every pay period (every 2 weeks). This will ensure that the data is being processed correctly and timely on your part and that Jeff/Whitney can process it into the national databases and have the data available for use.



Trimble GPS Units

To begin with, this protocol does not provide instructions on the operation of Trimble GPS units. The Alaska EPMT teams will be using Trimble GeoXT receivers and Pathfinder Office 3.0 software. This piece of the protocol should be addressed through Trimble training provided by Joel Cusick (907-644-3549). The binder provided for the class should be thoroughly reviewed by those not participating in this year's training. In addition, many GPS solutions are posted on the regional GPS web page - <http://inpakroms03web/rgr/gps/tips.htm>.

GPS Data

With that, let's jump right into the data dictionary that lies at the heart of our data collection using the Trimble GPS.

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GPS Transfers

To have the GPS communicate with the computer, you must have Microsoft ActiveSync installed on the computer. The current [version 4.1](#) is available online. Once ActiveSync is installed, the GPS cradle is connected to the computer, and the GPS (already on) is placed in the cradle, the GPS should connect to the computer. If you have problems, try restarting computer, reconnecting the GPS, and reconnecting the cradle. If you still have problems, try contacting one of us.

GPS Settings

Files must be initially transferred to the Trimble unit using the Data Transfer utility in Pathfinder Office. They are located in the [GPS Settings](#) folder in 2006_OUTGOING_DATA.

Transfer the following 4 files to the GPS:

1. [Configuration](#) file (Summer_06_TerraSync.tcf) following the instructions in the associated word file. If you get an error on the GPS, you are likely not running the current version (2.53) of TerraSync. Please upgrade from http://www.trimble.com/terrasync_ts.asp?Nav=Collection-39289 using the Pocket PC 2003 option. You will need your TerraSync serial number to upgrade
2. [Coordinate System Export](#) file (AK_3-10.CSW) following the instructions in the associated word file.

3. [Data Dictionary file](#) (06_AKEPMT_master.ddf) after you have arranged the fields (see “Data Fields” section).
4. [Data file](#) (_06data_PARK.imp) of data from previous years. (Not completed 5/15/06)

Set time zone:

1. Go to the “Start” menu of the Trimble unit
2. Tap on “Settings”
3. On the “System” tab, tap on “Clock”
4. Verify that the time zone is set to “GMT-9 Alaska” and tap OK.

To standardize our Trimble units for data collection, we are using a configuration file that sets the most important GPS settings to predetermined values.

1. Open up TerraSync on the unit (tap F1)
2. Select “Setup” from the main menu.
3. Below the “Current Configuration:” box, tap on the box labeled “Change”
4. Select “Summer_06_TerraSync” from the menu and tap on “Load”
5. Tap on the “Logging Settings” box from the “Setup” screen.
6. By default, the antenna height is 4.921 ft. Click on the wrench icon and change the height to just below your own height. You should hold the GPS at this height to collect data.
7. Still in “Logging Settings,” change the “Filename Prefix” (default ‘R’) to the first letter of your last name.
8. Still in “Logging Settings,” change “Between Feature Logging” to Style “Time” and Interval “5s.” This will maintain a track log for photo linking.

GPS Background Images

Having a background file display on your GPS or in PFO can be very helpful to navigate to a new location or verify that data is correctly recorded. To get a background image to display, you must create a jpg file in ArcGIS, transfer the file, and verify the coordinate systems of the GPS.

1. Make a map in ArcGIS. Some helpful information may include background photo, USGS topographic maps, NOAA charts, previous data, park boundaries, trails, etc.
2. Record what the map coordinate system is by double clicking on the “Layers” icon in the right navigation window. Look at the “Coordinate System” tab. The map should be in a projected coordinate system (like UTM). Be aware that regional data is being converted from NAD27 to NAD83 in 2006.
3. Once the data is arranged as you would like it and the screen has the map extent that you want (zoom in and out to export what is visible in the window), select “Export Map” from the “File” menu.
4. Experiment with different resolutions and qualities. Having a background image will slow down map drawing, so you need to balance between speed and image quality. The higher the resolution and quality, the slower the image will redraw. Since map drawing is affected by how large the map is, you may want to create several smaller maps for different study areas so the GPS has less to redraw at any one time.

5. Check the “Write World File” option and save the map.
6. Open PFO (testing the image in PFO will save you much anguish with the GPS)
7. Select “Coordinate System” in the “Options” window. Define the coordinate system to match the exported map. This is only changing how data is displayed, not how it is collected or saved. If the image was in NAD27, select “NADCON (Alaska)” for the datum NOT “NAD27 (Alaska)”. For NAD83, select “NAD 1983 (Alaska)” for the datum. If these options aren’t showing up, revisit updating PFO at the beginning of the GPS Data File Management section.
8. Make sure both units are in meters and hit “OK.”
9. Load the background in PFO by selecting “Background” from the “File” menu. Click “Add” and navigate to the image.
10. Change the coordinate system to match the coordinates you just established for PFO.
11. Select “OK” and the image should load.
12. Verify the image is correctly positioned by opening a data file (.ssf or .cor) and verify that the features align with the image.
13. Connect your GPS to the computer.
14. Using PFO transfer the image to the GPS using the “Send” tab and “Add”ing a “Background.”
15. On the GPS, go to “Setup” in TerraSync.
16. Change the “Coordinate System” to match those defined in PFO. If the correct datum is not appearing, revisit the “Coordinate System Export” updates in the GPS Settings section.
17. Go to “Map” and under “Layers” select “Background File.” Choose the correct file.
18. Under “Layers”, make sure the “Background” option is checked. Image should display and you won’t get an error if all the coordinate systems were properly assigned.

Data Fields

You may use the Data Dictionary editor utility in Pathfinder Office to arrange the data collection format for your own convenience:

- Please **do not** remove or add attribute values or data fields.
- Note that any field you alter as described below must be altered in all three feature classes (Pnt2Buf, Line2Buf, and Poly).
 - An easy way to do this is by copying the data field you’ve altered (ctrl+c),
 - Pasting it into the other feature classes (ctrl+v),
 - And then deleting the duplicate unaltered field it replaces (Delete key).
- Arrange the order of attribute values using the up and down arrows so that the ones you use most commonly are at the top of each list.
 - Set the values that you use for most records as defaults.
 - Save the modified file with your initials (e.g., 06_AKEPMT_JAH.ddf).

Location_Name	This is the general area where the activity takes place, with several possible in each park unit. For a description of each area, please see the LocationID table below. Note that a
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	single LocationID must either be inside or outside of the park boundary; please pay careful attention to this in choosing the appropriate one. You should certainly arrange these in the order of your most common usage.
Disturbance_Type	Because most of Alaska’s exotic plants grow only on disturbed sites, we are tracking what disturbance types are being invaded by what species in NPS units. The options are listed in the Disturbance Type table below. The most frequently applicable type is fill importation, which includes roadsides and construction sites.
Site_Description	The location description is an opportunity for you to delineate in words the exact location, as well as any information about that location that might be important. The first provision should enable someone who looks at a table of your data to understand where within the LocationID the work took place without having to use GIS. Please take the time while editing to be complete and also try to be concise. The second provision should note if there is special significance in the location, such as remoteness, proximity to a stream or river, or potential to be easily spread into other areas.
Buffer_Distance_M	This is the buffer distance in meters that will be used to convert points and lines into polygons. If you imagine the shape you will be creating, the buffer distance should extend the point or line to the boundary of the infestation at its maximum distance from the center point or line. The buffer distance will therefore be half the width of a linear shape or the radius of a circle around a point. The GPS unit can also offset a line so that you may walk the edge of a linear infestation, offset the line to the middle of the infestation, and assign a buffer distance according to its width. The buffer for uninfested roads and trails should generally be 5 meters, measured from the centerline of a trail or the barren edge of a road.
Taxon	This is the dominant exotic plant species of a particular infestation. All species that have been reported from Alaska NPS units are on this list. If the species of concern does not appear on the list or you are uncertain of its identity, enter “Other” and note the species or uncertainty in the Remarks field. If the mapped area is free of exotic plants, enter “None”.
Phenology	The phenology of the dominant exotic species is especially important for control timing and future planning. These are quite simple, with options of “rosette”, “no_flower”, “full_flower”, “in_seed”, and “stand_dead” (standing dead). Record the dominant phenology of the population at the time; however, in the remarks, you can clarify if the species has multiple phenologies. If there are no exotics present, enter “none”.
%_Cover	The cover class percentage of the dominant exotic species is a critical measure of an infestation’s density. Imagine yourself suspended directly above the polygon you are mapping, including the buffer applied to points and lines. The value you enter is the percentage of the entire area that is covered from this angle by the material of the exotic species, with options of 1, 5, 10, 20, 30, 40, 50, 60, 70, 80, 90, 95, and 100. This is much easier to do with small areas than with large ones, so please start by practicing with small patches and be conservative with your estimates (i.e., underestimate rather than overestimate). Note that there is a correlation between this value and the buffer distance or size of a polygon: as the buffer distance increases for a particular group of plants, their percent cover of the total area decreases. Do not worry if most of the time the value entered is 1, for this is common with the small and disperse plant populations we are dealing with. It is more important to record the true extent of an infestation than to demonstrate that an infestation is relatively dense.
Stem_Count	This is a stem count of the dominant exotic species. Please only enter a value when you are certain that you can provide a relatively accurate count of individual plants. If the action is a control event, this is much easier to ensure, for each person involved can count the number of plants he or she controls. If the action is not a control event, please do not record a value over 100 unless you have carefully counted the plants. You will find during control that there are almost always more plants than you saw at first. If you don’t count the plants, leave the field blank and do not enter 0. A zero should only be used if there are no plants.
Action	“Inventory” is the first documentation of a particular infestation, whereas “Monitor” is a follow-up visit to a previously inventoried site from this year or previous years. “Treatment” is the first control effort for a particular infestation and “Retreatment” applies

	to any subsequent control efforts in either the same or successive years. “Manual” involves pulling or digging. “Mechanical” involves actions like mowing, weed-whacking, chain-sawing, etc. “Chemical” involves the use of herbicides.
CntrlEffrt	For planning and evaluation, it is helpful to have a relative indicator of the control effort required for a particular infestation. This can be projected if the infestation is not controlled or actual if it is. To standardize, “low” refers to an infestation that could be manually controlled by one person in less than an hour. “Medium” infestations could be controlled by one person in less than an 8-hr. day. “High” infestations would require multiple people or multiple days to control.
Is_Exhaustive	If all the exotic plants encountered were recorded, enter “yes.” If only a subset of species are recorded, enter “no.” In general, you should record all species; however, if you are trying to map a particular species very accurately, you may want to use this option to ignore other species.
Comments	This is a free-for-all for you to convey anything that seems important about an infestation or uninfested area, such as: control might not work for a particular reason; species’ identity is uncertain or not listed in the species list; components of the native plant community; potential for spread if left untreated; data collection is incomplete; where to look if hidden; invading undisturbed plant community; apparent source of infestation; similar native species in the same area; need for monitoring, etc. Please use all lower case for consistency.
Park_Unit	Associated park is the four-letter code for whatever park unit you’re working in, which should be set as the default value.
Is_Inside_Park	If the area mapped is located on park land, enter “yes”; if it lies outside of the park boundary or on inholdings, enter “no”.
Recorder_Name	These are the initials of the person using the Trimble unit. Set your initials as the default value.
Team_Name	If you are performing the activity in question alone or with help, enter “AKEPMT”. If you are recording the accomplishment of volunteers, enter “Volunteer”, or of other NPS personnel, enter “Other”.
2Taxon, 3Taxon... 2Phenology, 3Phenology... 2%_Cover, 3%_Cover... 2StemCount, 3StemCount... 2Action, 3Action... 2Control_Effort, 3Control_Effort...	We have provided additional fields for 9 more exotic species other than the dominant species at a particular site. In general, we prefer that you record each species individually with its own shape rather than use these additional fields. This option is provided to save you time when there is a whole complement of species infesting the same area and you don’t have time to map them individually. Remember that if the extents of each species are not the same, this option should not be used. For each additional species, you must also enter the phenology, percent cover, stem count, action, and control effort (see above) using additional fields provided.
StartDate, StartTime	Don’t worry about these fields, because the unit creates them automatically for each feature recorded.

LocationID	Park	InPark	Location Description
serpentine_springs	BELA	yes	Serpentine Hot Springs and ATV trails radiating out from there
dmts_rd	CAKR	yes	road from Red Dog Mine to port
kakagrak_hills	CAKR	yes	abandoned military base and airstrip
kotzebue	CAKR	no	Kotzebue and surroundings

first_mile	DENA	yes	park road from the entrance to headquarters, including headquarters
kantishna	DENA	no	inholdings at the end of the park road
mckinley_village	DENA	no	development along Parks Highway outside the boundary
nenana_river	DENA	yes	banks of the Nenana River
park_rd	DENA	yes	park road between headquarters and Kantishna
parks_hwy	DENA	yes	Parks Highway along boundary
kuyuktuvuk	GAAR	yes	Kuyuktuvuk watershed and Oolah Pass
bartlett_cove	GLBA	yes	frontcountry Glacier Bay
beardslees	GLBA	yes	Beardslee Islands
dry_bay	GLBA	yes	Dry Bay and vicinity
east_arm	GLBA	yes	coastline of the East Arm of Glacier Bay
glacier_bay_other	GLBA	yes	areas within the park, but outside those otherwise described
gustavus	GLBA	no	Gustavus and surroundings
main_bay	GLBA	yes	the portion of Glacier Bay to the south of the two arms
west_arm	GLBA	yes	coastline of the West Arm of Glacier Bay
king_salmon	KATM	no	King Salmon and surroundings
lake_camp	KATM	yes	Lake Camp road and Pike's Ridge trail
brooks_camp	KATM	yes	Brooks Camp and surroundings
10000_smakes_rd	KATM	yes	road to the Valley of 10,000 Smokes
katm_outer_coast	KATM	yes	anywhere along the Katmai coastline
port_alsworth_town	LACL	no	the private lands of Port Alsworth
port_alsworth_nps	LACL	yes	parklands in Port Alsworth and surroundings
twin_lakes	LACL	yes	the Twin Lakes area
lacl_outer_coast	LACL	yes	anywhere along the Lake Clark coastline
exit_glacier	KEFJ	yes	Exit Glacier Road and associated development and trails
kefj_outer_coast	KEFJ	yes	anywhere along the Kenai Fjords coastline
seward	KEFJ	no	Seward and surroundings
chilkoot_trail	KLGO	yes	the Chilkoot Trail Unit
dyea	KLGO	yes	Dyea
skagway	KLGO	no	Skagway and surroundings
white_pass	KLGO	yes	the White Pass Unit
chitina	WRST	no	Chitina and surroundings
kennicott	WRST	yes	Kennicott (Town and Mine Site), Bonanza Ridge and Root Glacier Trails
may_creek	WRST	yes	NPS compound, airstrip, and surrounding roads and trails
mccarthy	WRST	no	McCarthy and surroundings
mccarthy_rd	WRST	yes	region from Copper River bridge to Kennicott River plus ATV trails
nabesna_rd	WRST	yes	Nabesna Road and ATV trails
remote_airstrip	WRST	yes	Peavine, Huberts, Tana, Jake's, C-N confluence, Chisana so far

slana	WRST	no	area outside of the park at the entrance to the Nabesna Road
viscenter	WRST	yes	headquarters and visitor center complex
coal_creek	YUCH	yes	Coal Creek watershed including road to Woodchopper Creek
sitka_nps	SITK	yes	Areas within SITK
sitka_outside_nps	SITK	no	Areas outside of SITK
other			Describe the location

Disturbance Type	Disturbance Description
ABDHOME	Abandoned Homesite
ANIMAL	Animal Related Disturbed Site
BRSHCUT	Mechanical Brush/Tree Cutting
COASTAL	Coastal/Beach
FLIMPRT	Fill Importation (e.g. Road or Railroad)
GLACIER	Glaciation
GRAZING	Grazing
HRBCIDE	Herbicide Application
LOGGING	Logging
MATEXTR	Material Extraction (e.g. Quarry)
MINING	Mining
MOWING	Mowing
ORVDST	ORV Disturbance
OTHER	Other Mechanical Substrate Alteration
PLOWING	Plowing
RIVER	River Action
SLIDE	Landslide/Avalanche
STREAM	Stream Action
THERMAL	Thermal Disturbance
TRMPLNG	Trampling
VOLCANO	Volcanic Action
WIND	Wind Disturbance/Erosion
WLD FIRE	Wildfire
WNDTHR W	Windthrow
NONE	No Disturbance

Collecting Data - Point, Line, or Polygons?

When you walk up to an infestation of exotic plants, the first question to ask yourself is: can this patch be best represented as a point, a line, or a polygon? Because all patches take up 2-dimensional space, they are all actually polygons. Using GPS units to map exact polygons takes a good deal of time, so we sometimes save time by mapping them as points or lines and using a certain “buffer distance” that the plants extend from the point or line.

In addition to mapping infestations, you should map areas where there are no exotic species to document that you looked and for future monitoring. This is critical baseline data – the absence of exotics is as valuable as the presence of exotics. Use the “none” or “0” option for the data fields to record the absence of exotic plants.

Points

- Use points on a very small patch of plants in a circular shape. Use a “buffer distance” around the radius of the circle to capture the size of the patch.

Lines

- Use a line to represent a long string of plants along a roadside, shoreline, or similar edge. Apply a “buffer distance” equal to half the width of the linear patch.

Polygons

- Actual polygons are best used to map large or irregular shapes that are not well-represented by points or lines. They can also be used to map infestations of particular concern, in order to provide sufficient precision to be able to document short-term changes in patch shape.

General Tips for Using the GPS

- While recording a feature, hold the unit head-high and away from your body, so that it can “see” more sky.
- The logging interval (how often the unit records a position within a feature) has been set in the data dictionary to one second for points and five seconds for lines. This is the desired interval; however, when satellite availability is marginal the 5 seconds may be too long to collect sufficient points. In this situation, temporarily change the logging interval to 1 second
 1. While in the Data view (because you’re collecting a feature) tap “Options”
 2. Select “Logging Interval” and change the “Logging Interval” to “1s”
 3. When good satellite coverage resumes, readjust the interval to “5s”
- We recommend recording at least ten positions for points and enough positions for lines to delineate the shape (more around the corners and curves, less for straight lines).
- For the integrity of the data, it is a good idea to begin a new rover file every few hours rather than using the same one all day. Also, make sure each event is in a separate rover file.
- Remember that you can always press “Pause” to stop the recording of positions temporarily while the feature is still open.

- Stopping and resuming a feature. If you are mapping a large area with multiple common species (such as a long road) and suddenly stumble upon an unusual species, you should map the unusual species more accurately then lumping into the larger polygon. In this case, stop the existing feature, map the specific feature, then resume the original feature.
 1. In TerraSync, stop the current feature by clicking “OK.”
 2. Map the new feature.
 3. To resume the original feature, in the menu where you usually pick the feature type, switch “Collect” to “Update Features.”
 4. Select the feature you want to resume. It is probably the second closest distance, and you will be able to see the comment along the bottom of the screen.
 5. Click “Begin” followed by “Log.”
 6. Select “Continue Feature (Append)” to continue adding points to the original feature.
 7. End the feature like normal.
 8. To collect a new feature, you will need to change “Update” back to “Collect.”
- Turn on/off sounds when collecting positions
 1. On the Start Menu tap on “Settings”
 2. On the “Personal” tab, select “Sounds and Notifications”
 3. On the “Volume” tab, check “Programs” and “Notifications” and adjust the volume bar.
- Offset feature. In general, you should map the boundaries with buffer as exactly as possible; however, sometimes you will be unable to map an edge because of satellite coverage (e.g., under trees, next to a building) or physical barriers (e.g. river, fallen trees). In these cases, you can map a set distance from the target and set the offset and direction. The offset applies to the whole feature, so plan ahead!
 1. With the feature already open, select “Offset” from the “Options” menu.
 2. For a line or polygon, the direction is the direction the target is from you as you walk the segment. The horizontal distance is the distance that you are from the target edge.
 3. For a point, you have 5 options: Distance-Bearing, Distance-Distance, Triple Distance, Bearing-Bearing, Triple Bearing. See this [QuickStart](#) file for more information.

Monitoring

All control sites from previous years should be monitored and retreated this summer. The reason for this is that we are in the beginning stages of exotic plant management in Alaska’s NPS units, and we need to know what is working and what is not. Beyond this, it is generally recommended for any exotic plant control that the site be monitored into the future, because there may still be a seedbank in the soil or plants may resprout. For control sites where there are exotic plants present upon return, control the site again and plan to return within a month or so to evaluate the effectiveness.

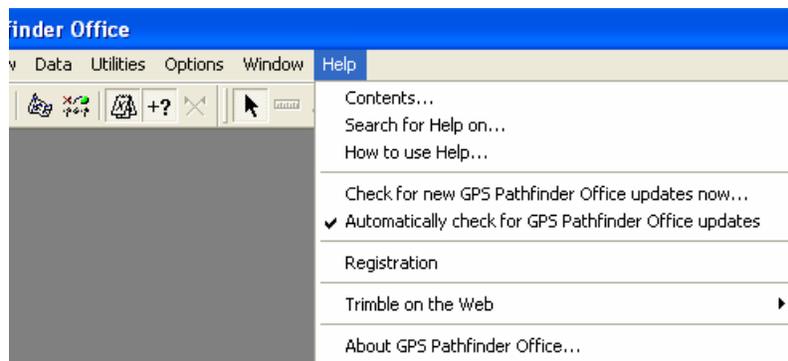
Navigating to Previously Recorded Polygons

Particularly when treating and monitoring previously documented sites, it is important to be able to relocate a site. Using the “Map” screen is generally much easier than using the “Navigation” screen.

MUST WRITE WHEN PARK DATA FILES READY

GPS Data File Management

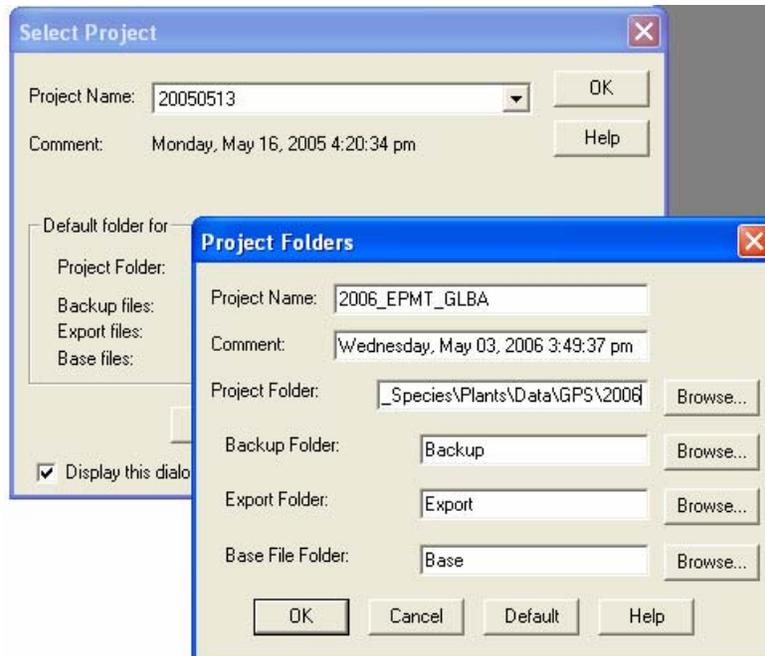
All GPS data that you collect this summer will be processed using Pathfinder Office (PFO) 3.00 software, Trimble’s desktop data management software. At the beginning of the season, make sure the software is updated and that it will continually update by selecting the option in the help menu. Depending on your park’s computer settings, you may not be able to automatically update software. Talk to your local IT staff for assistance.



[Update PFO](#) to have the current Alaska coordinates following the associated directions.

Selecting a Project

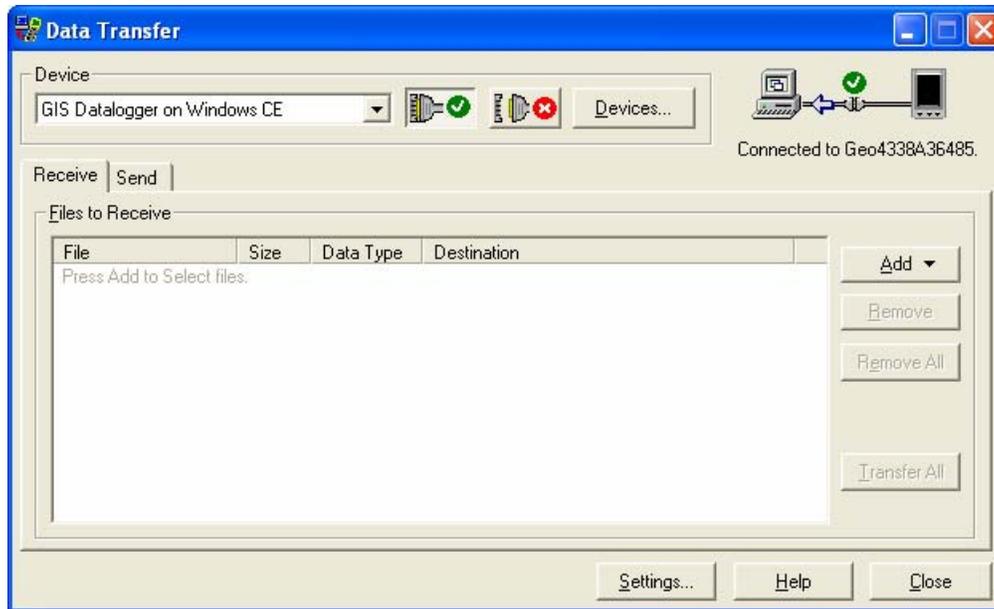
1. Open GPS Pathfinder Office 3.0.
2. The first time you download GPS files for the season, create a new project for your park by selecting “New”
3. Give the “Project Name” the title “2006_EPMT_(park code)” and browse to the ...\\Data\GPS\2006 folder for the “Project Folder.”



4. Select “OK”
5. Click “Yes” when it asks, “Folder already exists Do you want to continue?”
6. Creating the new project creates 3 new folders within ...\Data\GPS\2006 – Backup, Base, and Export.
7. Create one more folder (Final_Edits) within the project folder.
8. For the rest of the season, select the project name from the drop down menu that appears in the “Select Project” screen.

Transferring Rover Files

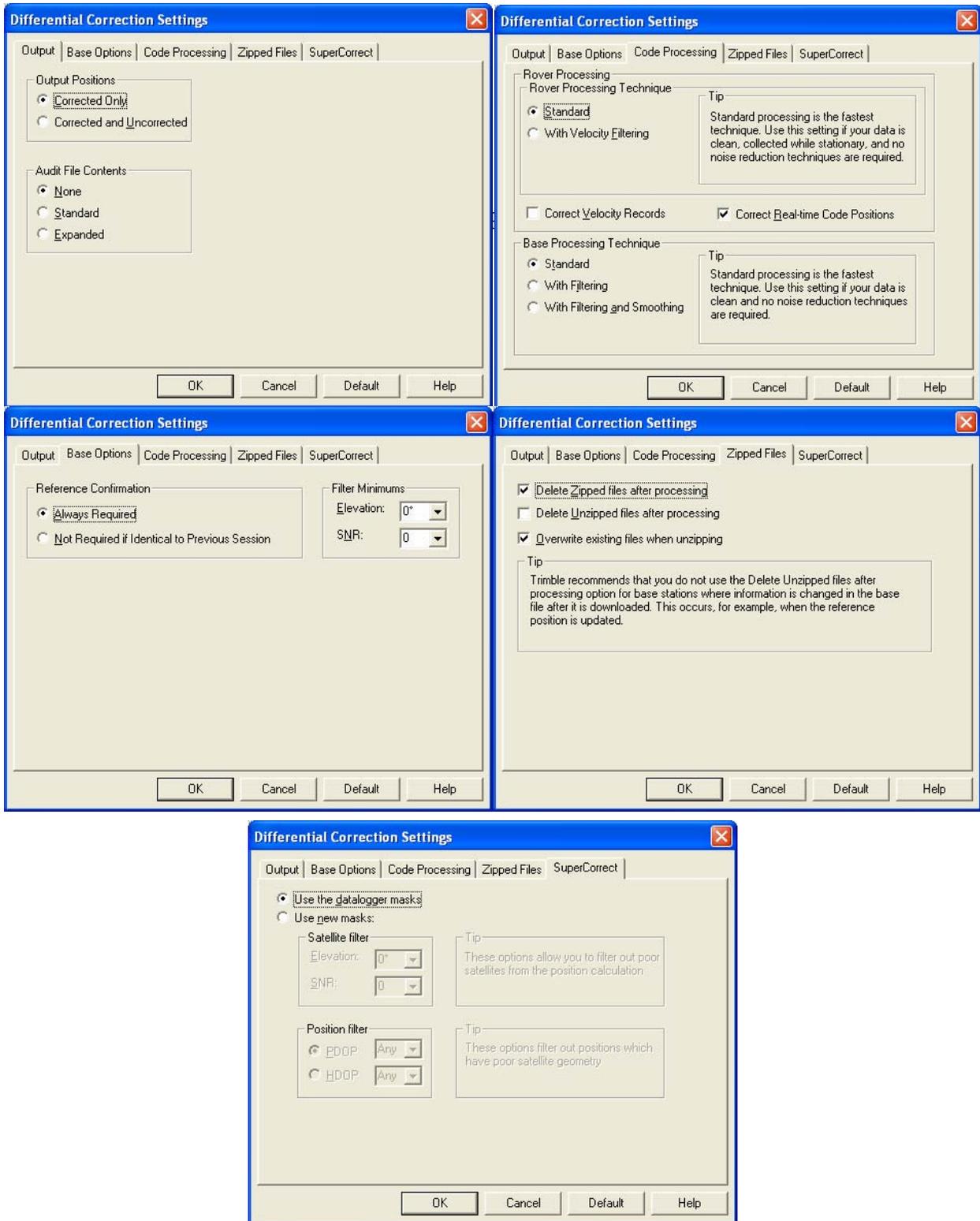
1. Transfer your rover files (.ssf) from the GPS unit to this folder as soon as possible after data collection.
2. In PFO, select “Utilities” > “Data Transfer”

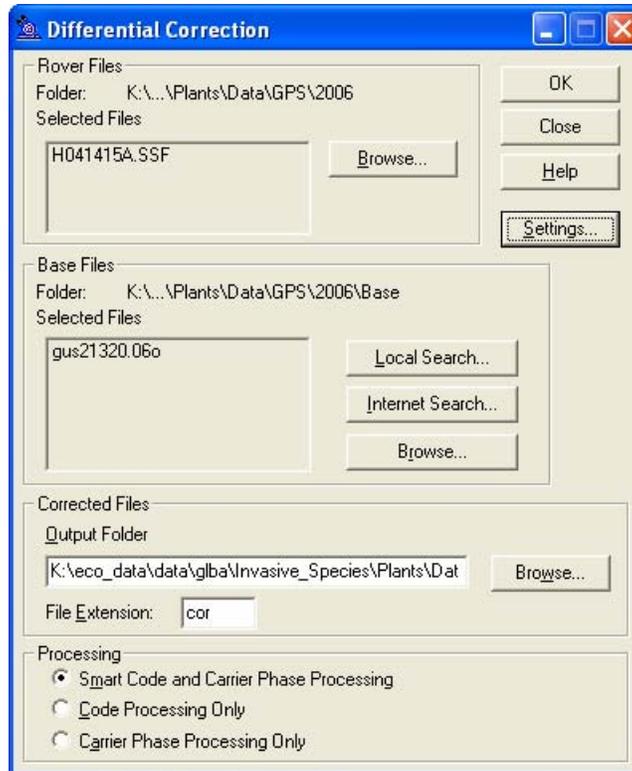


3. Make sure the device is “GIS Datalogger on Windows CE”
4. The GPS should connect (status in upper right) when you click the button with the green circle with check mark.
5. Click “Add” and “Data File”
6. Select all the files needing to be transferred.
7. Click “Transfer All.”
8. Back up your rover files immediately in the project Backup folder.

Differentially Correcting Rover Files

1. In PFO, select “Differential Correction” from “Utilities.”
2. Browse to the file(s) that need to be corrected. If you experience problems differentially correcting a file, process it by itself; however, you can generally do multiple files at the same time.
3. Get the most current base station information by hitting “Internet Search.”
4. Generally, you want to select the closest base station to where the data was collected. Sometimes, however, you may have to select a different base station.
5. Do not change any of the base station information or reference positions.
6. Verify that the “Settings” match the following screen captures.





9. Back up your .cor files immediately in the project Backup folder.

Editing Files

In order to ensure high data quality, please review and edit every rover file within a few days of the data collection.

1. Copy your corrected files from the project folder into the “Final_Edits” folder and add the prefix “edited_” to each file name. For example, R051015A.cor becomes edited_R051015A.cor. Copying and renaming the file before editing ensures that you do not overwrite the original corrected file when you begin editing.
2. Check the validity of positions, once differentially corrected, to make sure they match what you recorded in the field. Using a background image will help with this.
3. Click “Delete” in the Feature Properties window to see that the features positions are reasonable. The “Delete” does not delete your points but it gets rid of the feature grouping the points. Points should have all of their positions clustered together. Lines should have their positions aligned in a linear pattern. Polygons should have a linear boundary. You may need to delete whacky points (using the “Delete” in the “Position Properties” window), such as points more than a few meters from the center of a point or points that double back in a line or polygon. If a feature was recorded as the wrong type (e.g. line collected as point), follow this [protocol](#) for correcting. Document deletions in the rover log. Once the feature looks good, click “Undelete” in the “Feature Properties” window to regroup the positions.

4. Review the attributes attached to each features to check that the information is accurate and complete.
5. Elaborate on location descriptions or comments and eliminate any bad data. If you wrote in shorthand only understandable by you, now is the time to convert it to complete thoughts!
6. Please take the necessary time to make your data as finished as possible. These files will be transformed into GIS data at the end of the season for anyone to peruse.
7. In the project folder, maintain a status spreadsheet [park rover file status 2006.xls](#) (save the spreadsheet locally with your park code as a prefix) to keep track of which files still need to be edited. List any issues, deletions, deviations from the protocol, or field notes you had for each rover file.
8. Copy the Final_Edits files into the project Backup folder.
9. Periodically burn a CD of the project folder and upload all rover files (.ssf, .cor, and edited.cor) and log to the [\\Nps\akrdfs\WAN\ARO\NaturalResources\EPMT\2006 INCOMING DATA](#) folder at the end of every pay period.
10. Once you have finished editing a file, you are done with it until the end of the season.
11. Once all edited files are complete, let us know and we will transform them into GIS files to ensure consistency among park units and send them back to you for your reference in preparing the seasonal report.

Keeping Track of your Hours

All of our data must be entered into a nationwide database (APCAM – the Alien Plant Control and Monitoring database) that requires very specific information about the amount of time spent and people involved in every activity we perform, not only in the field but also in the office.

To ensure consistency between all the parks, Jeff and/or Whitney will be doing all the data entry in APCAM. Please realize that this is a major burden that you will not have to bear. In order for this to happen, however, we will require very specific information on the time you spend on individual activities on a daily basis from the moment you read this protocol until the last day you work for the EPMT in 2006. I know that this seems extreme, but there is no other way to satisfy the database requirements and minimize database angst.

1. Please copy the spreadsheet [park time record 2006.xls](#) to your local folder and change “park” to your park’s acronym.
2. At the end of each day, make a log of what happened.
3. All work time activities should be accounted for, including:
 - Preparation
 - Travel
 - Inventory
 - Control
 - Monitoring
 - Restoration
 - Education

- Data management
 - Planning
4. If the activity is associated with a GPS rover file, record those file(s) in your time log.
 5. Every time you open the file, it will update the sum of the total hours spent working in each category (tab “Sum of Hours by Category”) and display a pie chart (tab “Chart of Hours by Category”).
 6. As with all important files, back this one up on a regular basis.

Here’s an example of a hypothetical 2-day trip to Denali. The fields shaded gray are automatically calculated.

Day of Week	Date	Start Time	End Time	Category	Location	Activity description	Rover File Associated with Activity	Person 1	Person 2	Number of other people	Total People	Total People Hours
Wed	6/14/2006	7:00	8:00	Preparation	Office	Preparation for Parks Highway control event		JAH	PSB		2	2.00
Wed	6/14/2006	8:00	12:00	Travel	Travel	Travel from Anchorage to DENA		JAH	PSB		2	8.00
Wed	6/14/2006	12:30	13:30	Inventory	Parks Highway	Inventory of Several Melilotus infestations	H061412A.ssf	JAH	PSB		2	2.00
Wed	6/14/2006	13:30	14:00	Education	Parks Highway	Education and orientation for volunteer groups		JAH	PSB		2	1.00
Wed	6/14/2006	14:00	17:00	Control	Parks Highway	Melilotus control event w/ 6 volunteers from DENA	H061412A.ssf	JAH	PSB	6	8	24.00
Thur	6/15/2006	8:00	9:00	Outreach	DENA	Meeting with park staff		JAH			1	1.00
Thur	6/15/2006	8:00	10:00	Monitoring	DENA	Monitoring of 2004 control sites	H061514A.ssf	PSB			1	2.00
Thur	6/15/2006	9:00	10:00	Control	DENA	Vicia control with park staff	H061514A.ssf	JAH		3	4	4.00
Thur	6/15/2006	10:00	14:00	Travel	Travel	Travel from DENA to Anchorage		JAH	PSB		2	8.00
Thur	6/15/2006	14:00	17:00	Data Management	Office	Data management, upload/editing		JAH	PSB		2	6.00

Photo Management

*** **All photo data** should be edited and updated to the [regional drive](#) by the end of every pay period (every 2 weeks). This will ensure that the data is being processed correctly and timely on your part and that Jeff/Whitney can process it into the national databases and have the data available for use.

Photos are an excellent tool for exotic plant management, not only to document infestations and sites for our own internal purposes, but also to convey to others what we’re dealing with and what we have accomplished. Several excellent photo opportunities include:

- Before and after photos of infestations that are controlled

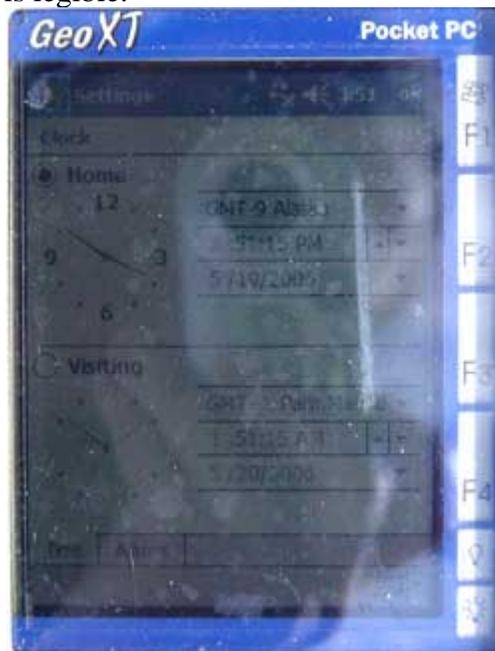
- Volunteer events – work in action
- New or uncertain species, range expansions, or particularly nasty infestations
- Close-ups of particular species to aid in identification
- Restored plant communities
- Educational events
- Yourselves and others working with exotic plants

That said, we can only use these photos later on if we keep them organized and collect relevant information about them.

Taking Photos

In 2006, we are going to maintain our existing protocol of taking a GPS “Photo_pt” feature, as well as turning on the track log to enable us to link photos with the software GPS-Photo Link.

- Set the camera’s clock to be as close to the GPS clock as possible.
- Resolution should be as high as reasonable given memory constraints, with the optimal filesize (for a .jpg) being greater than 500 KB per photo.
- Before you take your first picture of the day, take a picture of your GPS screen showing the time with seconds. This is critical for the GPS-Photo link software.
- Start>Settings>System>Clock has this screen. Because the GPS screen is reflective, make sure this photo is legible.



- For photos of anything on the ground, please collect a “Photo_pt” feature using your Trimble unit at the spot where you are standing when taking the photo.
- Include with the feature enough information to enable anyone to determine what the photo should display.
- Keep track of the photo number or name and include this information in the Trimble unit under the “Photo_pt” feature.

Managing Photos

We recommend that you manage your photos – meaning upload, organize, and delete useless photos – at the same time that you’re editing your spatial data in Pathfinder Office.

- Maintain subfolders by event, such as 20060613_Weed_Pull, that will help you and us locate a photo.
- Step through the “Photo_pt” features with an image browser window open at the same time and ensure that they are linked, i.e. the rover file of “Photo_pt” features have the image name in the comment field.
- Delete any photos that are unusable – blurry, too dark/light, etc.
- In each images “Properties,” fill in the “Author” with the photographers initials, the “Subject” with description of the photo, and the “Comments” with a lat/lon and/or descriptive location.
- Always keep the original images. If you want to edit an image, resave it with another name, such as [original filename]_edited.
- At least initially, we will process the photos with GPS-Photo Link.
- At the end of every pay period, transfer all photos you have that are connected to “Photo_pts” or otherwise.

Voucher Specimens

What to Collect

In order to back up our observations of plants in the field, voucher specimens should be collected under certain circumstances:

- Any species previously unrecorded in a park unit must be collected.
- Any species that you cannot positively identify must be collected.
- Any species with a significant range expansion or found in remote areas should be collected, with priority given to species of greater concern.

In 2006, please make an effort to fully collect all specimens previously reported but not collected. Please refer to the table [AK_EPMT_Master_Exotics.xls](#) for a list of all the species reported for each park with a column for when the plant was collected. Data for collection years before 2005 were taken from the I&M database NPSpecies and may need verification with your park herbarium. Please let [Whitney Rapp](#) know of any changes needed to this spreadsheet.

How to Collect

A photo should be taken of the whole plant prior to collection, and a “Photo_pt” should be collected to document its location. All parts of the plant should be represented, including roots

and flowers or fruits, and should be preserved using a plant press or heavy books with newspaper. Each species should be dried within newspaper and labeled with the information below or a unique collection number (initials followed by a number – WSR01, WSR02) that relates back to the master table.

Please review the University of Alaska Museum's collection recommendations (<http://www.uaf.edu/museum/herb/howtocoll.html>).

Information about the specimen collected should be recorded in the spreadsheet ([park ID](#)) [Collections 2006.xls](#). It may not be feasible to record all fields, but an effort should be made to populate as many fields as possible. Fields in bold in the table below are required.

Collnum	Initials followed by number. e.g. WSR01
Park	Four letter park acronym. e.g. GLBA, DENA
Scientific Name	Best identification possible. AKNHP will verify all identifications and modify as necessary.
General Locality	General location of specimen. e.g. Parks Highway or Bartlett Cove.
Specific Locality	Specific location of specimen. e.g. 1.5 miles from park boundary on east side of road.
Lat (DD)	Latitude in decimal degrees. e.g. 59.68595
Long (DD)	Longitude in decimal degrees. e.g. -135.56987
GPS/Map	Source of lat/long - from GPS or calculated from map.
Map Datum	Map datum used for lat/ long (NAD27, 83 etc).
Elev	Elevation of collection.
Elev unit	ft or m
Habitat	Describe habitat. e.g. roadside, coastal meadow, riparian, spruce forest
Substrate	Substrate texture (gravel, sand, loam, etc) and/or moisture (wet, moist, dry, etc)
Exposure	Which way the site faces (N, S, E, W, etc)
Slope	Angle of site (flat, gentle, steep)
Abundance	Relative abundance of species at location (abundant, common, infrequent, rare)
Assoc. spp.	Other native or non-native species growing in the area.
Collector(s)	Enter as: Heys, J. Enter multiple collectors separated by commas with "&" before the last collector: Heys, J. & Rapp, W.
Collection Date	full date (6/25/2006)
Determiner	Person who identified specimen.
Det Date	Date specimen was identified (9/27/2006).
Photo#	Name of digital image or full path to image.
NPS Accession #	Generally, the entire set of specimens will receive the same accession number from the park's curator.
NPS Catalog #	Each specimen will get a unique number from the park's curator. If 3 common dandelions are collected, please make 3 separate rows each with their own catalog #.
Notes	Any other taxonomic or collection notes/comments, such as flower color (some blossoms fade with drying, some colors intensify), odor, conspicuous use by animals, specimen looks like a hybrid or doesn't match descriptions, etc.

We have set up an agreement with the University of Alaska Natural Heritage Program in Anchorage to not only assist us with the identification of species but also to prepare herbarium specimens (mounted on paper and with proper labeling) of any plants we collect in the field.

At the end of the season:

1. Obtain the accession number and catalog numbers from your park's collections curator.
2. Verify that each specimen is identified by at least its Collection Number.
3. Send all specimens to Jeff Heys at the regional office with a print out of (park ID)_Collections_2006.xls
4. Ensure the table (park ID)_Collections_2006.xls is transferred to your park's folder within the regional folder
\\Nps\akrdfs\WAN\ARO\NaturalResources\EPMT\2006_INCOMING_DATA

Phenology Log

Throughout the season, please record when exotic species first flower and first set seed using the [park Phenology_2006.xls](#) spreadsheet (save the spreadsheet locally with your park code as a prefix). It may be easiest to print out the sheet and routinely write down the dates throughout the season. Then, enter the information into the spreadsheet. If you visit several park areas periodically that you suspect have different phenologies, record dates on separate sheets for these different locations.

Seasonal Report

The seasonal report for your park is your chance to summarize what you've learned and accomplished with regard to exotic plant management. These are immensely valuable for record-keeping and future planning, and it will also demonstrate to your supervisor the quality of your work. There is no page limit for this, because it's more important that you get across what you did and found this summer, no matter the length. Please be as thorough as possible with this. Templates from past seasonal reports are available and will be sent out at the end of the season.

Items to be covered in the report:

- Accomplishments (Prevention, Detection, Inventory, Control, Monitoring, Restoration, Education, Contacts, etc.) – use your time log to remind yourself of all the activities you have been involved in
- Summarize 2006 exotic plant distribution (diversity and relative species abundance in frontcountry and backcountry) in comparison to what you know of results from previous years. Highlight any new species or situations of particular concern.
- Recommendations for next year are your chance to improve what we do.
- Please include a table that includes all the invasive species documented in and around your park at any time. This should be the list from [AK EPMT Master Exotics 2006.xls](#) and any additional species documented in 2006. If there are species on our master list that you do not believe should be there, please let us know. Include in this table if you observed it in 2006 and what parts of the park it was seen (e.g. Park Headquarters, Park Road, Backcountry, Outside Park).

- Anything else you think is important
- Please use [ITIS](#) accepted scientific and common names

As far as timing goes, the data process must be complete by Sept. 1 at the latest and preferably earlier so that we can troubleshoot any problems or inconsistencies that arise. We would prefer to have the reports by Sept. 15th, but if that presents a problem, let us know. In any event, if you have any questions or issues, give us a call. We will be traveling around the state for much of the summer, but we will be checking messages periodically and you guys are our top priority.

Thank you for your participation this summer!! Please give Jeff or Whitney any suggestions to how we can improve this protocol and the program. We hope that you are interested in continuing to work with the Alaska Exotic Plant Management Team in the future.