



Alaska Exotic Plant Management Team

2011 Field Protocol

Last Modified: 1/2011



ON THE COVER

The Alaska Exotic Plant Management Team logo

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2011 Field Protocol

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Contents

	Page
Figures.....	vi
Tables.....	vii
Acronyms.....	viii
Introduction.....	1
Background.....	3
The Alaska EPMT	5
National Performance Reporting	6
Other Key Points.....	7
Starting the Season.....	9
Establish Park Priorities.....	9
General File Management.....	9
GPS Setup.....	13
Required Software	14
<i>Computer/GPS Syncing Software</i>	14
<i>TerraSync</i>	14
<i>GPS Pathfinder Office</i>	16
Initial GPS Clean Up	17
Initial GPS Setup	20
<i>Set the time zone</i>	20
<i>Configurations</i>	20
<i>Data Dictionary</i>	23
Data Dictionary.....	25

Main Data Dictionary Fields	25
Supplemental Data Dictionary Fields	30
<i>Restoration</i>	30
Data Dictionary Customization	31
Data Dictionary Transfer	33
Coordinate Settings	35
GPS Background Images	37
Creating a Background Image	37
Testing a Background Image	38
Loading a Background Image	40
Species Data Files	42
Data file as background	45
Data file as existing data file	46
Collecting GPS Data	47
General Tips for Using the GPS	48
Monitoring	49
Navigating to Previously Recorded Polygons	50
Processing GPS Files	51
Setting up a Project	51
Transferring Rover Files	52
Differential Correction	53
Editing Files	57
Rover File Log Process	59
Historic Alaska EPMT Data	61
Photo Management	63

Managing Photos	63
Photo Points	65
Photo Contest	67
Voucher Specimens	69
What to Collect	69
Identification Process	69
Collection Process	70
Time Log	73
Time Log Process	74
Phenology Log	77
Annual Summary Report	79
Report Format	79
What Should the Report Include	79
Formatting Standards	81
Review Process	81

Figures

	Page
Figure 1. Map of all Exotic Plant Management Teams across the nation.	4
Figure 2. Map of Alaska National Park Service units.....	5
Figure 3. Example of a local file management outline.	10
Figure 4. 2003 GeoXT, 2005 GeoXT, and 2008 GeoXH GPS units. (from left to right)	13
Figure 5. The three feature types (in red) for mapping infestations (in green) are displayed with, if applicable, the buffer distance (in black) and the completed buffers (in blue).	47
Figure 6. Differential Correction Summary text file.....	56
Figure 7. The location of historic Alaska EPMT data in NPS Theme Manager.....	61
Figure 8. Screen shot of GeoXT showing UTC time with seconds. Alaska daylight savings time is 8 hours less.	65
Figure 9. Examples of photos from the 2010 Alaska EPMT season.	67
Figure 10. The number of oxeye daisy individuals observed and removed at Reid Inlet since 2005.....	80

Tables

	Page
Table 1. Invasive plant mapping fields in the Alaska EPMT Data Dictionary.....	25
Table 2. Description of locations for the field Location_Name.....	27
Table 3. Description of disturbances for the field Disturbance_Type.	29
Table 4. Restoration fields in the Alaska EPMT Data Dictionary.....	30
Table 4. Coordinate settings for TerraSync, Pathfinder Office, and ArcGIS.	35
Table 6. Rover File Log spreadsheet fields.....	60
Table 7. Photo_Pt fields in the Alaska EPMT Data Dictionary.....	66
Table 8. Specimen_Pt fields in the Alaska EPMT Data Dictionary.	71
Table 9. Collections spreadsheet fields.....	72
Table 10. Time Log spreadsheet – Field Descriptions.....	74
Table 11. Time Log spreadsheet – Activity Categories.....	75
Table 12. An example of a 1-day trip in GLBA with two EPMT staff, one other NPS employee, one SCA, two volunteers and a 8 person SAGA crew. The fields shaded blue are automatically calculated.....	76
Table 13. Example of the Phenology Log.....	77

Acronyms

AKNHP	Alaska Natural Heritage Program
AKRO	Alaska Regional Office (National Park Service)
BMP	best management practice
EPMT	Exotic Plant Management Team
GIS	geographic information system
GPRA	Government Performance and Results Act
GPS	global positioning system
NAD	North American Datum
NPS	National Park Service
PFO	Trimble Pathfinder Office software
SAGA	Southeast Alaska Guidance Association
SCA	Student Conservation Association
WMDC	Windows Mobile Device Center

Introduction

Welcome to the 2011 season with the Alaska Exotic Plant Management Team! We are so excited to have you working with us. You are entering the seventh working season of this team and will continue a proud tradition of being part of one of the most weed free teams in the United States.

We plan on having a busy season this year and hope you are up to the challenge. In return for all of your hard work you will have the opportunity to be witness to some of the most beautiful, remote, and pristine areas of the National Park Service.

This document will guide you through this summer's field season, including setting seasonal priorities, collecting data using Trimble GPS units and a customized data dictionary, data management, collecting specimens, taking photographs, and more. This same protocol has been used in Alaska parks since 2005, ensuring the highest data quality standards and consistency across park units. The protocol itself is a GPS-based method to map invasive plant infestations and uninfested areas and collect relevant information about them. The data will be incorporated into three systems: 1) an Alaska NPS invasive plant management geodatabase, 2) a statewide database developed to track invasive plant distributions across jurisdictional boundaries, and 3) a national NPS database which tracks EPMT accomplishments nationwide.

If you have any questions, comments, or suggestions about how we can improve this protocol and the program feel free to contact us at any time. Thank you in advance for all of your hard work this season and we hope you are interested in continuing to work with the Alaska EPMT in the future.

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Background

The national parks are home to complex communities of native plants and animals that have developed over millions of years. The delicate natural balance within these communities is threatened by the invasion of invasive plants. These invasive plants are able to reproduce rapidly because the animals and diseases that keep them in check in their home ranges are missing. When the populations of native plants are reduced, the animals that depend upon them lack the food and shelter needed for survival.

Today, invasive plants infest approximately 2.6 million acres in the national park system, reducing the natural diversity of these places. Drawing funds from the 1999 Natural Resource Challenge set forth by Congress, the National Park Service Biological Resource Management Division has established rapid response Exotic Plant Management Teams (EPMT) to control invasive plants. Modeled after the approach used in wildland firefighting, EPMTs provide highly trained, mobile strike forces of plant management specialists who assist parks in the control of invasive plants.

Each EPMT serves multiple parks within a broad geographic area (Figure 1). They work to identify, develop, conduct, and evaluate invasive species removal projects and undertake appropriate native species restoration efforts. Each of the sixteen established teams has developed site-specific strategies for combating invasive plants that reflect the needs and resources of the more than 200 parks they serve. Each team employs the expertise of local experts and the capabilities of local agencies. Each sets its own work priorities based on the following factors: severity of threat to high-quality natural areas and rare species; extent of targeted infestation; probability of successful control and potential for restoration; opportunities for public involvement; and park commitment to follow-up monitoring and treatment.

For more information on the national EPMT program go to the [EPMT website](#).

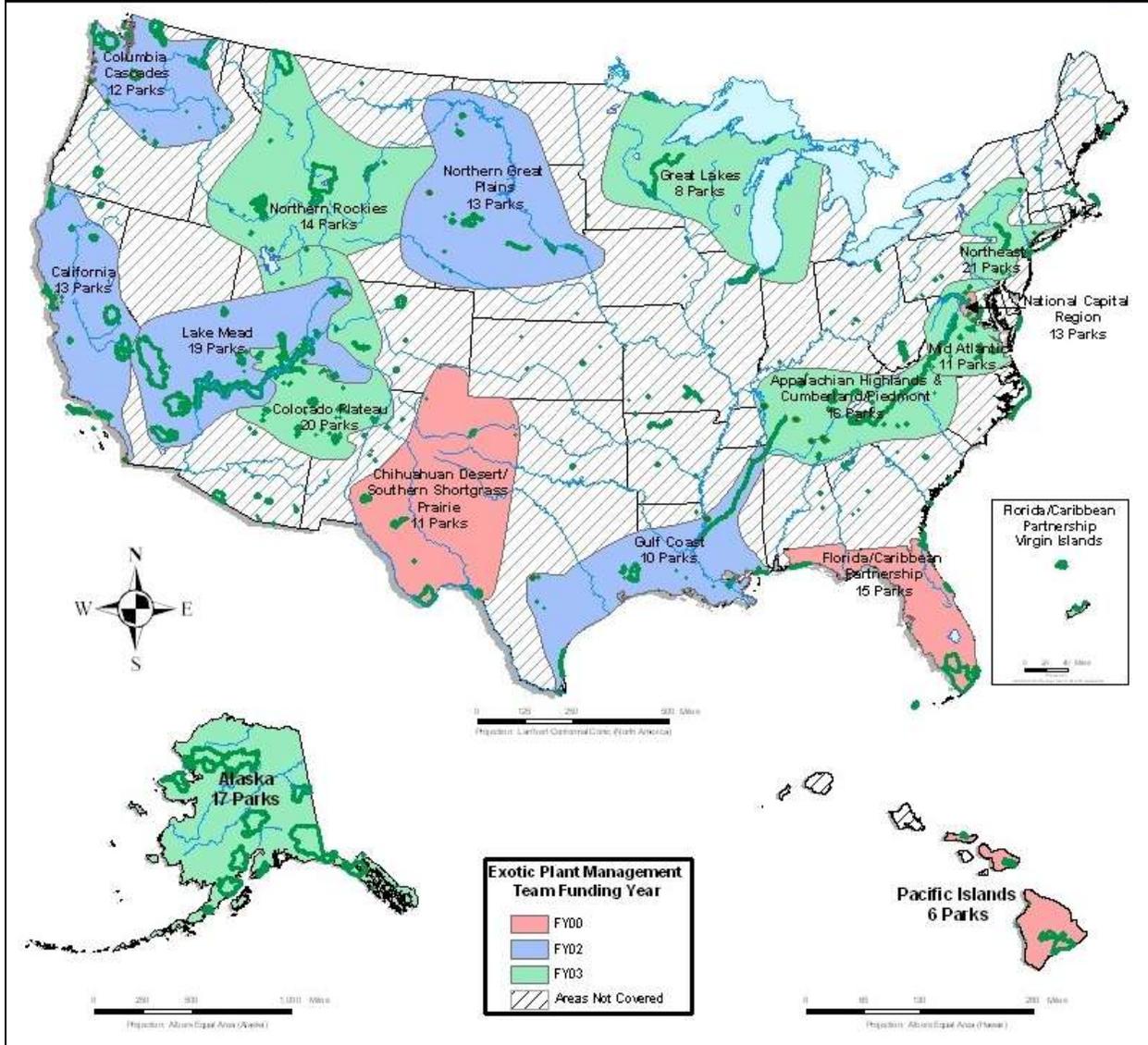


Figure 1. Map of all Exotic Plant Management Teams across the nation.

The Alaska EPMT

People often think of Alaska as too cold or remote for invasive species to become problematic. However, the past decade has demonstrated that Alaska is just as vulnerable as other regions of the country, especially as climate change potentially increases the range of invasive species. Aggressive invaders such as purple loosestrife, spotted knapweed, Canada thistle, and yellow toadflax have already taken hold of areas in Alaska's wildlands. With permanent funding secured in 2003, the Alaska EPMT has been able to manage these aggressive invaders early in the invasion process on the 54 million acres of National Park Service land in Alaska (Figure 2).

Due the remote nature of many of the Alaska park units and the associated high cost of travel, the Alaska EPMT does not have a centralized crew which travels to each park like many of the EPMTs in the lower 48. Instead, the team works cooperatively with partner parks to train existing park staff, partially fund seasonal park staff, and support internship positions. This increases the amount of on the ground time dedicated to invasive plant management at each park. In addition to park specific staff the Alaska EPMT also funds Southeast Alaska Guidance Association (SAGA) AmeriCorps crews, who assist with the treatment of larger infestations.

These personnel, combined with volunteer assistance from community groups and partnerships with neighboring land managers, work towards containing existing infestations and eradicating new or smaller infestations using manual control methods in eight Alaska park units. To date the team has eradicated nearly 300 individual infestations, including individual infestations of bird vetch, reed canarygrass, and other species.

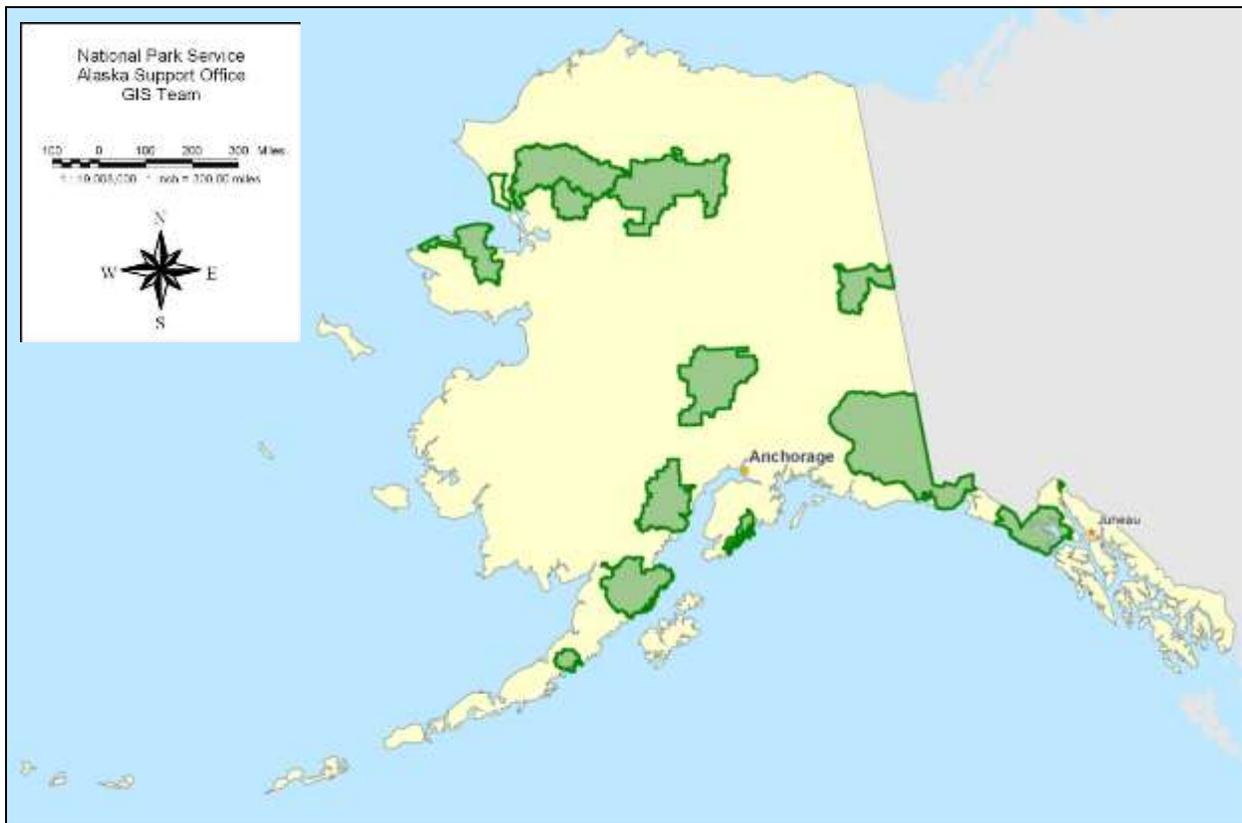


Figure 2. Map of Alaska National Park Service units.

The Alaska EPMT is unique in one other area as well: due to several factors herbicides have not been heavily utilized on Alaska NPS lands in the past. An Integrated Plant Management Plan and Environmental Assessment were completed in early 2010 and the 2011 season is the first time herbicides will be used at multiple parks within the region. Only Alaska EPMT regional staff will be conducting these herbicide treatments this summer. All other Alaska EPMT treatments will be manual, hand-pulling treatments with all reproductive plant parts bagged and properly disposed of.

The Alaska EPMT education and outreach program engages local residents and park visitors teaching about the unique situation that faces Alaska parks when it comes to invasive weeds. The team hosts educational events to engage the general public during Alaska's short summer season, including volunteer weed pull days, summer camp presentations, 4th of July activities, and informational booths. A few of the more creative outreach activities include creating invasive weed recipes, an invasive plant identification table with fresh samples, and a non-native flower arranging contest. These activities encourage volunteers and community members to have a more hands on learning experience with invasive plants.

For more information on the Alaska EPMT program go to the [Alaska EPMT website](#).

National Performance Reporting

It is imperative that all work completed this season gets documented properly so park and Alaska EPMT annual reports accurately reflect the team's accomplishments and efforts. The work completed is also included in Government Performance and Results Act (GPRA) reports which are then used to determine funding.



Only work on NPS managed lands counts towards your park's GPRA goals. That should not deter any work are nearby areas or potential vectors but it is important to remember that only treatments on NPS managed lands (NOT necessarily all lands within your park's boundary) counts as GPRA acres.

The EPMT work must be properly documented in two main areas for GPRA purposes:

Acres Treated

Any control efforts conducted by the Alaska EPMT, volunteers, other park employees, etc. needs to be mapped. Control efforts should be mapped using the GPS method described in this protocol. If GPS mapping is not feasible, the work can digitized from field notes, pencil and ink sketches and other written descriptions. In order to accomplish this all the relevant information must be communicated clearly to the Alaska EPMT regional staff. In an effort to keep the Alaska EPMT data as consistent as possible, digitizing should only be used as a last resort.

Acres Controlled/Eradicated

It is critical that previous infestations are revisited and remapped on at least an annual basis. If the infestation is not detectable, map the location where it once was with a GPS unit and indicate what plant species was there and choose the phenology code "not_detected." At the end of season, the Alaska EPMT regional staff will use past years data and park knowledge to determine if the infestation should be considered eradicated.

Other Key Points

Herbicide Treatments

This is the first year where larger scale herbicide treatments will be taking place. Only Alaska State Certified Pesticide Applicators may physically apply any chemical. The Alaska EPMT regional staff will be leading the application process this season and will be coordinating with the parks on where and when treatments will take place.

Photo contest

Each year the National EPMT program has a contest for photos to include in the National Annual Report cover and body. Having a photo selected brings the team major national bragging rights. These shots should include people (arrowheads, uniforms and other NPS symbols are always good), treatment and outreach activities, invasive plants, and great backgrounds. Staging the photo is acceptable (scenic backgrounds, wildlife, etc).

Starting the Season

Establish Park Priorities

- What will be accomplished this summer?
- What areas need to be revisited?
- What new areas need to be inventoried?
- What are the control priorities?

With Alaska EPMT staff members stationed across the state this summer it is essential that everyone has a plan on how to approach the short Alaska growing season. First, Alaska EPMT staff should review the annual field reports for their park. The insights from previous years will be invaluable to establishing priorities for this season. Feel free to consult with the Alaska EPMT regional staff for a state-wide perspective or a park supervisor for a local perspective.

Remember that plant phenology will dictate a large part of the season's schedule. The park phenology log should be consulted and updated to help determine what species are ready for treatment at what times during the season (see the Phenology Log section on page xx). Undoubtedly, there will always be more that could have been done but with a solid set of priorities a significant amount of work can be accomplished over the summer.

To aid in developing priorities, the Alaska EPMT regional staff have created [infestation summary spreadsheets](#) for each park. These summaries represent all previous data merged to delineate the maximum mapped area of different species infestations over the course of the Alaska EPMT program. This information will aid in the development of your park's priorities for the 2011 season. For instance, if there are 250 infestations of species A (invasiveness ranking of 52) covering 13 acres and 3 infestations of species B (invasiveness ranking of 71) covering 0.009 acres, it should be evident that the priority is species B since it has a higher rank, is less abundant, and covers a much smaller area.

The invasiveness ranking is based on the Alaska Natural Heritage Program's (AKNHP) Invasive Weed Ranking Project. A list of all ranked species can be found at the [AKNHP website](#).

General File Management

In an effort to organize data that works well for each team and any future users, emphasis should be placed on creating a systematic file structure at each park. In most cases this has already been accomplished and should be replicated for the 2011 season. In collaboration with a park supervisor or IT staff, identify the appropriate place to store the park EPMT data that is accessible by park EPMT staff, is secure, and is routinely backed up. This may be on a local computer (C:\) or on a network drive (e.g. W:\ drive). It is best to co-locate data for 2011 with previous park EPMT data. Relocate the past year(s) folder or create a folder (such as "EPMT_parkcode") in this location that will contain ALL of the park data, documents, etc. Within this folder, tiers of subfolders can be created.

The suggested file structure is depicted in Figure 3 with each balloon representing a folder. This is definitely not exhaustive of the possible file structures, but it is a good general framework to organize files.

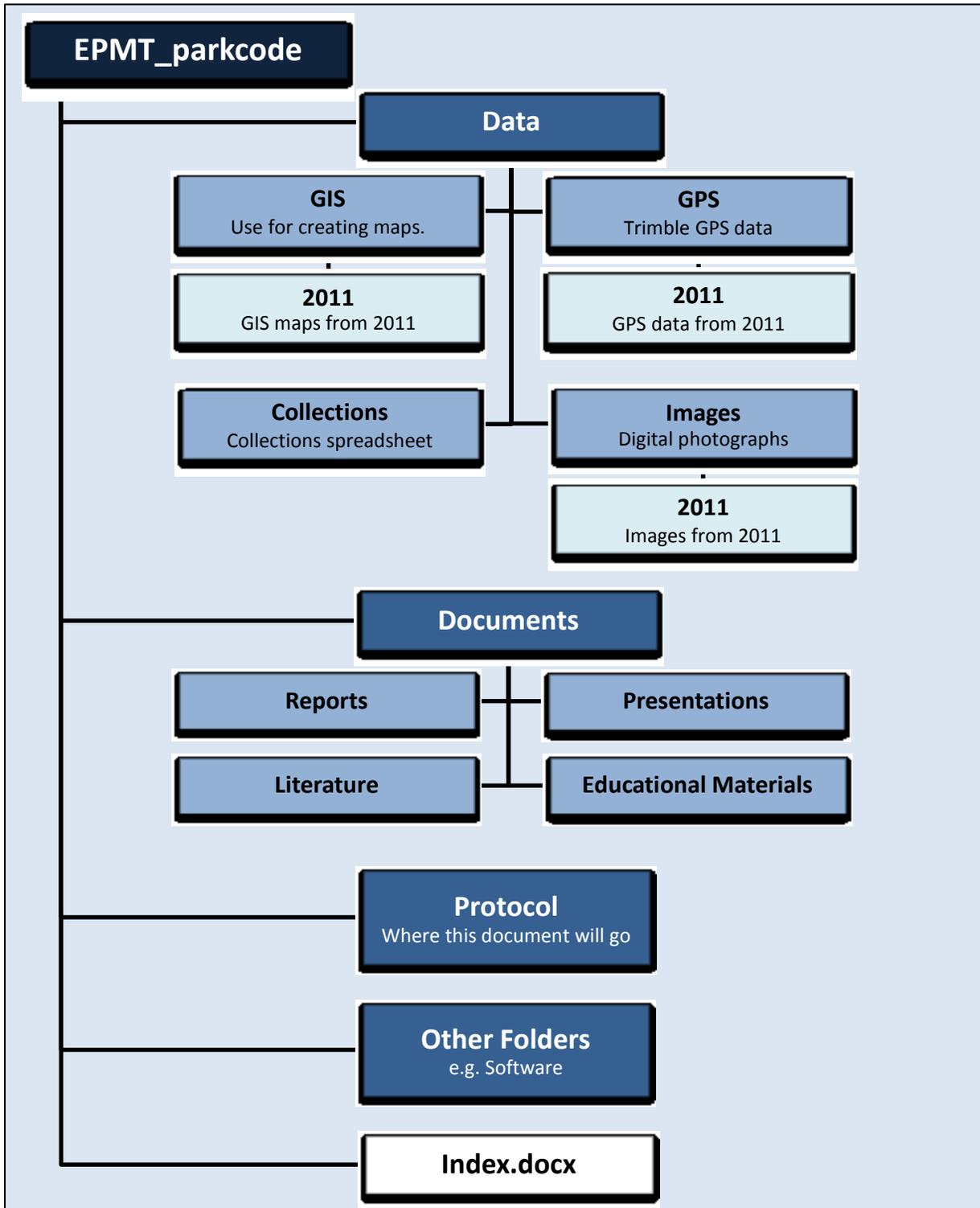


Figure 3. Example of a local file management outline.

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.

At the end of the season, either copy the entire folder to the [Alaska EPMT regional folder](#) under a folder with the park code OR make 2 copies of the entire folder to CD or DVD. Label the CD/DVD with Alaska EPMT, park code, and year. Send one copy to the Alaska EPMT regional staff and store another at the park.

All GPS and photo data must be edited and uploaded to the [Alaska EPMT regional folder](#) under a folder with your park code. Please upload all data produced in the preceding two weeks by the end of each pay period throughout the summer. This will ensure that the data is being processed correctly, in a timely fashion, and it can be processed and uploaded into the national and statewide databases so the information is available for use throughout the season. The 2011 season upload dates are:

June 3	July 15	August 26
June 17	July 29	September 9
July 1	August 12	September 23

GPS Setup

Global positioning system (GPS) is a method using satellites to triangulate and accurately pinpoint a geographic location. The Alaska EPMT uses GPS to map invasive plant infestations and treatment areas so work progress can be precisely reported. This is of the utmost importance as these reports go to partner agencies as well as Congress and are how the team justifies its existence and funding. Without accurate and comprehensive data collection the team would no longer have the support it needs to continue.

This same protocol has been used in Alaska parks since 2005, ensuring the highest data quality standards and consistency across park units. The data will be incorporated into three systems: 1) an Alaska EPMT geodatabase, 2) a statewide database developed to track invasive plant distributions across jurisdictional boundaries – the Alaska Exotic Plant Information Clearinghouse, and 3) a national NPS database which tracks EPMT accomplishments nationwide – Alien Plant Control and Management database.

This portion of the document will serve as a guide for collecting data using Trimble GPS units; which include a customized data dictionary. The Alaska EPMT uses primarily Trimble GeoXT GPS receivers. Due to upgrades this past winter there are several large scale differences between the software used on the 2003 GeoXTs and the 2005 or 2008 GeoXTs. Pay attention to which GPS unit you are using when going through these protocols. The easiest way to differentiate between these units is by the number of buttons on the unit: 2003 GeoXTs have two buttons; 2005 GeoXTs have 11 buttons; 2008 GeoXTs have 10 buttons and a stylus holder on the front of the unit (Figure 4).

It is important to note that this protocol does not provide instructions on the operation of Trimble GPS units. More detailed protocols on GPS operation should be addressed through Trimble training provided at the spring Alaska EPMT training. Many GPS solutions are also posted on the [Regional GPS page](#).



Figure 4. 2003 GeoXT, 2005 GeoXT, and 2008 GeoXT GPS units. (from left to right)

Required Software

Any GPS unit provided by the Alaska EPMT regional staff should be properly upgraded with the relevant software at the beginning of each season. You should ensure that your park computer and any park GPS units you may be using have the following software downloaded.

Computer/GPS Syncing Software



If the computer operates on Windows XP, then Microsoft ActiveSync is the software that enables the computer to communicate with the GeoXT units that run TerraSync software. The current version, [ActiveSync 4.5](#), is available online for download. If you do not have administrative privileges on your computer you must have park IT staff download the needed software.



If the computer operates on Windows 7, then Windows Mobile Device Center (WMDC) is the software that enables the computer to communicate with the GeoXT units that run TerraSync software. The current version, [Windows Mobile Device Center 6.1](#), is available online for download. If you do not have administrative privileges on your computer you must have park IT staff download the needed software.

TerraSync

TerraSync is the software that operates the GPS functions on Trimble GPS units with touch screens.

- **For 2003 GeoXT units:** [TerraSync v4.12](#)
- **For 2005/2008 GeoXT units:** [TerraSync v5.01](#)

If you do not have administrative privileges on your computer you must have park IT staff download the needed software. In order to download this software you must also have a specific installation code. If the GeoXT you are using is from the Alaska EPMT regional staff, contact them for the code.

It is important to note that this protocol does not provide instructions on the operation of TerraSync. More detailed protocols on GPS operation should be addressed through the Trimble training provided at the spring Alaska EPMT training. Many GPS solutions are also posted on the [Regional GPS page](#) or through the Trimble website:

- **For 2003 GeoXT units:** [TerraSync Software Getting Started Guide for v4.](#)
- **For 2005/2008 GeoXT units:** [TerraSync Software Getting Started Guide for v5](#)

To install TerraSync on your GPS unit follow these steps:

1. Connect the GeoXT cradle to a power source and to the PC workstation.



WARNING: 2003 GeoXT units should be connected to a computer via a USB hub.
*There have been cases of power surges from the 2003 GeoXT damaging computers.
The USB hub buffers this surge.*

2. Turn the GPS unit on.
3. Place the GPS unit in the cradle.
 - a. Insert the top end with the antennae into the cradle first and then press the bottom onto the connection pins. These pins are fragile so try to line up the unit as well as possible and do not use too much force when placing the unit into the cradle. The unit should snap into place with a single firm push.
4. ActiveSync or WMDC should start on the PC automatically to sync with the unit. If the program does not start try reconnecting the GPS, reconnecting the cradle, or restarting the computer. If the GPS unit still does not connect contact your park GIS/GPS specialist or the Alaska EPMT regional staff.
 - a. **If you are using WMDC**, select ‘Connect without setting up your device’ when prompted.
 - b. **If you are using ActiveSync**, select a ‘Guest’ partnership when prompted.
5. Select the correct software to install:
 - **For 2003 GeoXT units:** From the [TerraSync v4.12](#) website select the link for “v4.12 - TerraSync software for Windows Mobile 2003” and run the install package. If you do not have administrative privileges on your computer you must have park IT staff download the needed software.
 - **For 2005/2008 GeoXT units:** From the [TerraSync v5.01](#) website select the link for “v5.01 - TerraSync software for Windows Mobile 5.0/6” and run the install package. If you do not have administrative privileges on your computer you must have park IT staff download the needed software.
6. You will need to provide a valid installation code. TerraSync software codes cannot be reused on multiple GPS units. If the GeoXT you are using is from the Alaska EPMT regional staff, contact them for the code.
7. Once a valid installation code is entered the installation will run automatically.
8. Check both GPS and PC to ensure that all elements of the installation are complete.

GPS Pathfinder Office

GPS Pathfinder Office (PFO) is the Trimble software that operates on a computer to transfer and process GPS data from a Trimble GPS unit. To run the process properly each park should be running the most current version: [Pathfinder Office v5.00](#). If you do not have administrative privileges on your computer you must have park IT staff download the needed software. In order to download this software you must also have a valid license. Check with the park GIS/GPS specialist on being able to use the NPS's floating PFO license.



If any park is working with older software versions please let the Alaska EPMT regional staff know since the settings outlined in this protocol may be different.

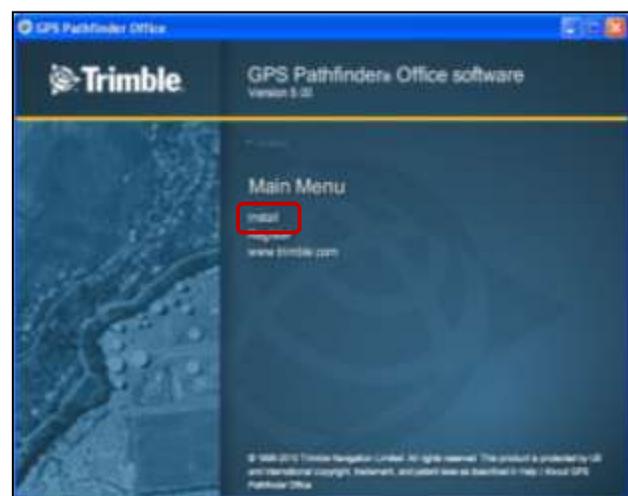
To install PFO on your computer follow these steps:

1. From the [Pathfinder Office v5.00](#) website select the link for “v5.00 - GPS Pathfinder Office, Software” and save the zipped file to your PC. If you do not have administrative privileges on your computer you must have park IT staff download the needed software.



2. Unzip the file – it should be called “GPS Pathfinder Office v500”

3. Start the Autorun.exe file to launch the PFO installer.
4. Select “Install.”



5. Select “Install GPS Pathfinder Office.”
6. Select English as the language.
7. Read and accept the Terms and Conditions.



8. You will need to provide a valid license number. Check with the park GIS/GPS specialist on being able to use the NPS floating PFO license. Instructions can be found on the Alaska [Regional GPS page](#).
9. Select the Complete installation option.

Initial GPS Clean Up

At the beginning of the season any GPS unit to be used during the summer should go through the following clean up procedures. This will ensure that the GPS unit is running at top speed and has plenty of storage space.

1. Connect the GeoXT cradle to a power source and to the PC workstation.



WARNING: 2003 GeoXT units should be connected to a computer via a USB hub.
*There have been cases of power surges from the 2003 GeoXT damaging computers.
 The USB hub buffers this surge.*

2. Turn the GPS unit on.
3. Place the GPS unit in the cradle.
 - a. Insert the top end with the antennae into the cradle first and then press the bottom onto the connection pins. These pins are fragile so try to line up the unit as well as possible and do not use too much force when placing the unit into the cradle. The unit should snap into place with a single firm push.

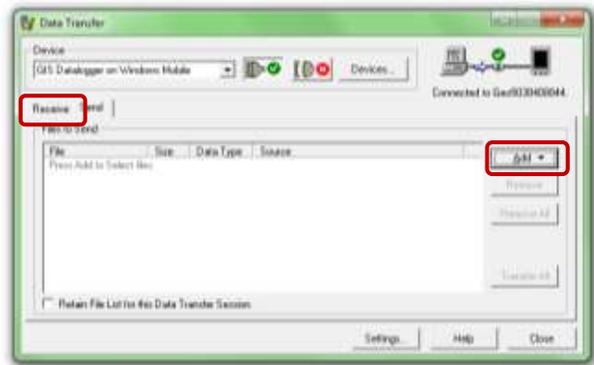
4. ActiveSync or WMDC should start on the PC automatically to sync with the unit. If the program does not start try reconnecting the GPS, reconnecting the cradle, or restarting the computer. If the GPS unit still does not connect contact your park GIS/GPS specialist or the Alaska EPMT regional staff.
 - a. **If you are using WMDC**, select ‘Connect without setting up your device’ when prompted.
 - b. **If you are using ActiveSync**, select a ‘Guest’ partnership when prompted.
5. Open PFO

6. Launch the Data Transfer Utility, marked with the  button on the left side of the screen or from the Utilities menu, and connect to the GPS unit.



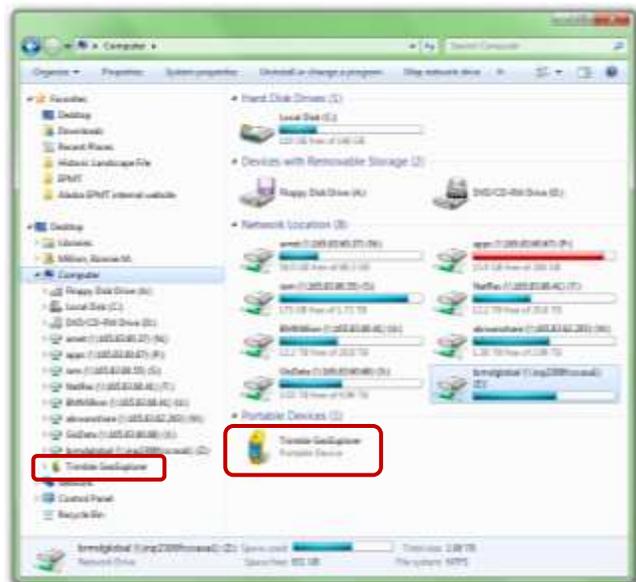
Never transfer GPS associated files using Windows Explorer or any other means besides the PFO Data Transfer Utility.

7. The Data Transfer Utility automatically opens in Receive mode. On the Receive Tab click “Add” and then “Data File”.
8. Select all the rover files on the GPS unit to a backup folder.
9. Click “Transfer All.”

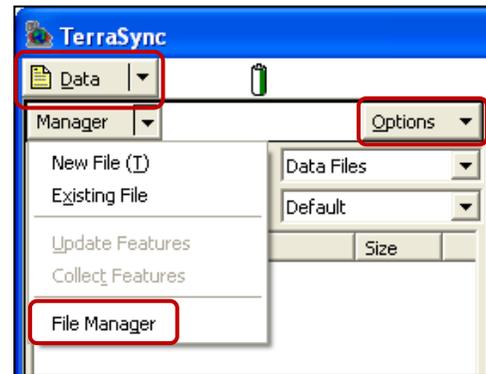


10. Close PFO

11. With the GPS unit still connected to the computer, select the Mobile Device in Windows Explorer.
12. Navigate to \Disk\My Documents\TerraSync (most likely location), copy all files to a backup folder on your computer, and then delete them from the GPS.

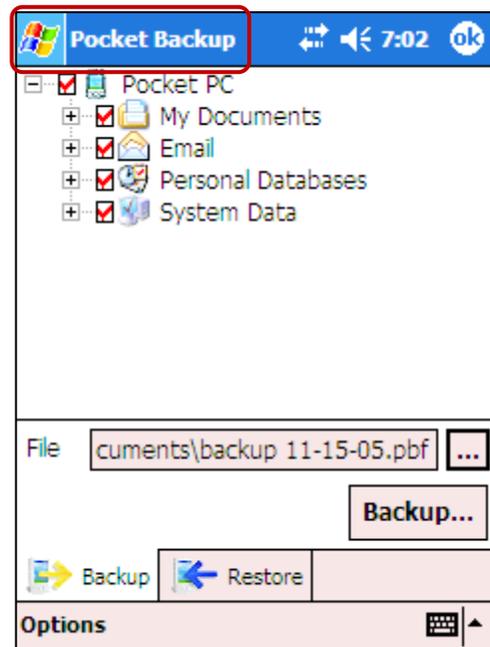


13. On the GPS unit open TerraSync, go to the Data screen and open File Manager.
14. Using the Delete function under the Option Menu to delete all previous data that is no longer needed. For example, old rover files, data dictionaries, backgrounds, etc. Some background files may still be useable if made for a similar area or purpose.
15. Close TerraSync.



Notify your park GIS/GPS specialist, park supervisor, or past users of the location where you saved these files.

16. **For 2003 GeoXT units:** Create a Backup File on the 2003 GeoXT unit
 - a. Select Start>Backup Now.
 - b. Once the Backup is complete disconnect the 2003 GeoXT unit from the computer and select OK to Soft Reset the unit.

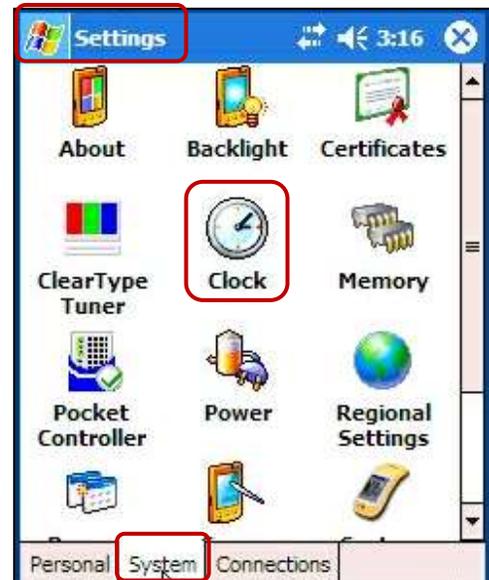


Initial GPS Setup

Once a GPS unit has been updated with the necessary software and cleaned of any past year's data it is time to make sure the unit is set up correctly for collecting data.

Set the time zone

1. Go to the Start menu of the Trimble unit.
2. Tap Settings.
3. Tap the System tab at the bottom of the screen.
4. Tap on Clock.
5. Verify that the home time zone is set to "GMT-9 Alaska" and tap OK.
6. Once the unit has been outside and received satellite information double check that the time is still correct.



Configurations

In order to maintain consistency in data collection across the parks the Alaska EPMT uses a standard configuration file. Configuration files are Trimble specific and allow a user to standardize all GPS units with the most important GPS settings to predetermined values. These files are not password protected, so settings can still be altered in the field when conditions merit.



*These files should be transferred using the PFO Data Transfer Utility **NOT** via Windows Explorer.*

1. Connect the GeoXT cradle to a power source and to the PC workstation.



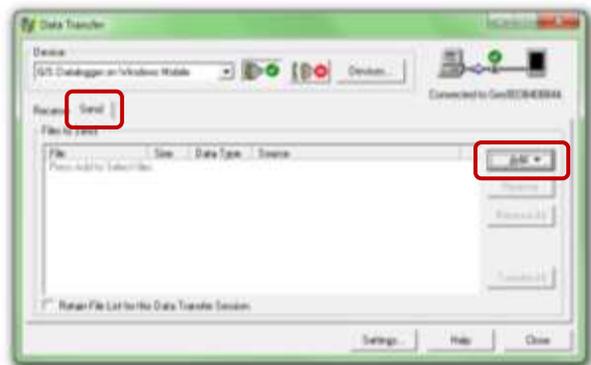
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2. Turn the GPS unit on.

3. Place the GPS unit in the cradle.
 - a. Insert the top end with the antennae into the cradle first and then press the bottom onto the connection pins. These pins are fragile so try to line up the unit as well as possible and do not use too much force when placing the unit into the cradle. The unit should snap into place with a single firm push.
4. ActiveSync or WMDC should start on the PC automatically to sync with the unit. If the program does not start try reconnecting the GPS, reconnecting the cradle, or restarting the computer. If the GPS unit still does not connect contact your park GIS/GPS specialist or the Alaska EPMT regional staff.
 - a. **If you are using WMDC**, select ‘Connect without setting up your device’ when prompted.
 - b. **If you are using ActiveSync**, select a ‘Guest’ partnership when prompted.
5. Open PFO.

6. Launch the Data Transfer Utility, marked with the  button on the left side of the screen or from the Utilities menu, and connect to the GPS unit.

7. The Data Transfer Utility automatically opens in Receive mode. Select the Send tab to be able to transfer files from the computer to the GPS unit.
8. Click “Add” on the right side of the window, select Configuration, and navigate to the Configurations folder.



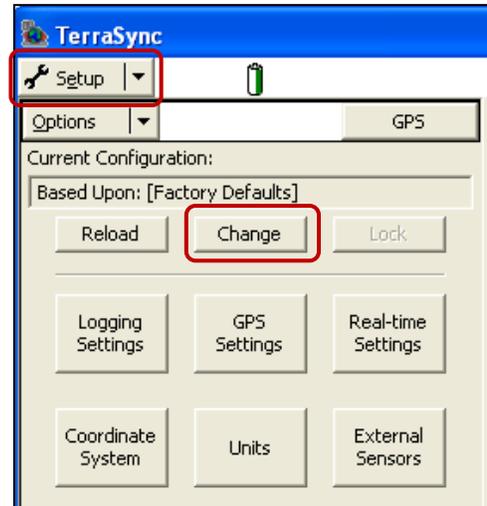
9. Browse to the appropriate configuration file:
 - **For 2003 GeoXT units:** [GeoXT2003Summer_2011_TerraSync.tcf](#)
 - **For 2005/2008 GeoXT units:** [GeoXTSummer_2011_TerraSync.tcf](#)
10. Click OK and then Transfer All. If an error message pops up on the GPS unit, it is mostly likely not running the correct version of TerraSync.

Once the configuration file has been transferred ensure the GPS unit has been updated by following these steps:

1. Remove the GPS unit from the cradle and turn it on.

2. Turn on TerraSync and select the Setup screen.

3. Below the “Current Configuration:” box, click “Change”.



4. Select the transferred configuration file from the menu and click “Load”

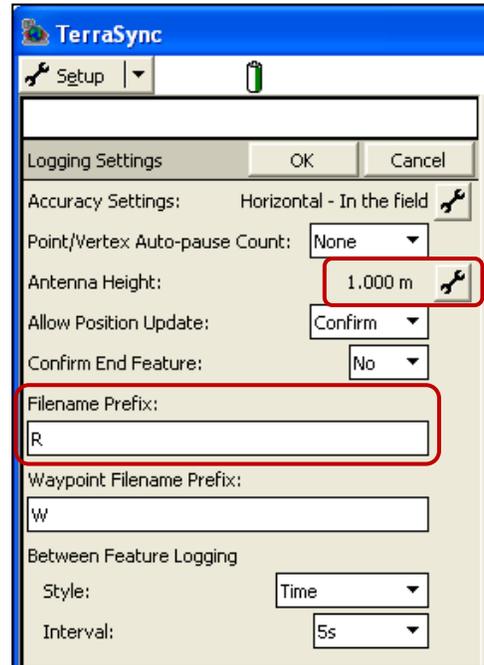
- **For 2003 GeoXT units:** [GeoXT2003Summer_2011_TerraSync.tcf](#)
- **For 2005/2008 GeoXT units:** [GeoXTSummer_2011_TerraSync.tcf](#)

5. Back at the Setup screen, click “Logging Settings”.



6. By default, the antenna height is 1m. Click on the wrench icon and change the height to the user's chest height.
 - a. If using an external antenna change the height to the height of the external antenna. The GPS unit or external antenna should be held at this height when collecting data.

7. Still in "Logging Settings," change the "Filename Prefix" (default 'R') to the user's initials. This allows for accountability throughout the season.



Data Dictionary

Data dictionaries are a method for the user to input information about the feature being collected by a GPS unit, like a digital form. This information is then translated into the attributes table of the exported GIS shapefile once the data is downloaded. This allows for clearer communication from the field and better accuracy in the data. The Alaska EPMT has a standard, customizable data dictionary that is described in more detail in the Data Dictionary section on page xx.



*These files should be transferred using the PFO Data Transfer Utility **NOT** via Windows Explorer.*

1. Connect the GeoXT cradle to a power source and to the PC workstation.



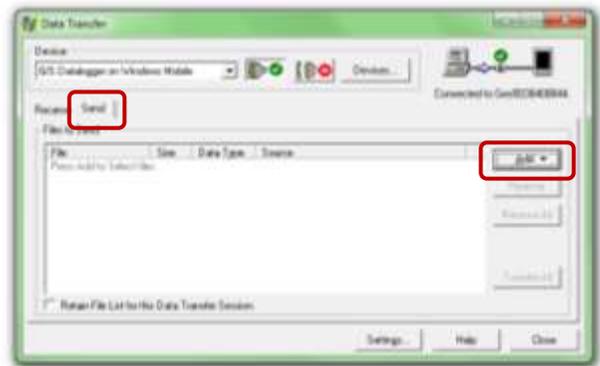
WARNING: 2003 GeoXT units should be connected to a computer via a USB hub.
There have been cases of power surges from the 2003 GeoXT damaging computers. The USB hub buffers this surge.

2. Turn the GPS unit on.

3. Place the GPS unit in the cradle.
 - a. Insert the top end with the antennae into the cradle first and then press the bottom onto the connection pins. These pins are fragile so try to line up the unit as well as possible and do not use too much force when placing the unit into the cradle. The unit should snap into place with a single firm push.
4. ActiveSync or WMDC should start on the PC automatically to sync with the unit. If the program does not start try reconnecting the GPS, reconnecting the cradle, or restarting the computer. If the GPS unit still does not connect contact your park GIS/GPS specialist or the Alaska EPMT regional staff.
 - a. **If you are using WMDC**, select ‘Connect without setting up your device’ when prompted.
 - b. **If you are using ActiveSync**, select a ‘Guest’ partnership when prompted.
5. Open PFO.

6. Launch the Data Transfer Utility, marked with the  button on the left side of the screen or from the Utilities menu, and connect to the GPS unit.

7. The Data Transfer Utility automatically opens in Receive mode. Select the Send tab to be able to transfer files from the computer to the GPS unit.
8. Click “Add” on the right side of the window, select Data Dictionary, and navigate to the Data Dictionary folder.



9. Select the appropriate dictionary file:
 - **For 2003 GeoXT units:** [2011_AKEPMT_master.ddf](#)
 - **For 2005/2008 GeoXT units:** [2011_AKEPMT_master_v5.ddf](#)
10. Click OK and then Transfer All. If an error message pops up on the GPS unit, it is mostly likely not running the current version of TerraSync.

Data Dictionary

Data dictionaries are a method for the user to input information about the feature being collected by a GPS unit, kind of like a digital form. This information is then translated into the attributes table of the exported GIS shapefile once the data is downloaded at the office. This allows for clearer communication from the field and better accuracy in the data. The Alaska EPMT has a standard, customizable data dictionary that should be downloaded onto each GPS unit and should be filled out for each feature collected. This portion of the document will serve as a guide for understanding, customizing, and uploading the Alaska EPMT Data Dictionary.

Main Data Dictionary Fields

The standardized data dictionary has fields that help systematically describe invasive plant infestations throughout the state. Every Alaska EPMT GPS unit should come with a [data dictionary cheat sheet](#) – which summarizes Table 2 into a handheld version – and a [species cheat sheet](#) which summarizes the species listed in the dictionary.

Table 1. Invasive plant mapping fields in the Alaska EPMT Data Dictionary.

Field Name	Type	Description
Park_Unit	Menu	The four-letter code for the park unit where the data is being collected. Alaska EPMT park staff should customize the default for this field.
Location_Name	Menu	The general area where the activity takes place with several possible in and around each park unit. The data dictionary has all LocationIDs already loaded in alphabetical order. See Table 3 for a description of each LocationID. To visually see the delineation of each LocationID, pull up the “EPMT Location Index” theme in NPS Theme Manager and view it via ArcMap. Alaska EPMT park staff should customize this field and arrange in the order of most common usage and delete ones that will not be used.
Site_Description	Text	This field provides the opportunity to explain the exact area within the LocationID as well as any information about that area that might be important. This should enable someone who looks at this data to understand where within the LocationID the work took place without having to use GIS. Take the time while editing to be complete. Additionally, it should note if there is special significance in the location, such as remoteness, proximity to a stream or river, or ease of spread into other areas.
Disturbance_Type	Menu	The main type of disturbance. Because most of Alaska’s invasive plants grow on disturbed sites, the Alaska EPMT tracks what disturbance types are being invaded by what species. See Table 4 for more detailed description of the disturbance types available. Alaska EPMT park staff should customize this field and arrange in the order of most common usage and delete ones that will not be used.
Buffer_Distance_M	Numeric	The buffer distance in meters that will be used to convert points and lines into polygons. Imagine the shape being created; the buffer distance is the distance in meters from the center point or line to the boundary of the infestation. The buffer distance will therefore be half the width of a linear shape or the radius of a circle around a point.
Taxon	Menu	The dominant invasive plant species of a particular infestation. The data dictionary has all species that have been reported from Alaska NPS units already loaded in alphabetical order. If the species of concern does not appear on the list or the identity is uncertain, enter “Other” and note the species or uncertainty in the Comments field. If the mapped area is free of invasive plants, enter “None.” Remember to specifically record species with an invasiveness ranking of greater than 50 instead of as part of another species’ infestation.
Phenology	Menu	The dominant phenology of the species at the time of mapping. This is especially important for control timing and future planning. The comments field can be used to clarify if the species has multiple phenologies. If revisiting a location for a specific species and it is not redetected, put the name of the species being searched for in the Taxon field and select “not_detected” in phenology. This will allow for better tracking of species eradications. <ul style="list-style-type: none"> • rosette = young and not full sized • no_flower = full sized but not flowering or producing seed • full_flower = flowering • in_seed = producing seed • stand_dead = standing dead • none = no invasives present

Field Name	Type	Description
%_Cover	Menu	The percent of the area mapped covered with the dominant invasive species – 1-5%, 6-25%, 26-50%, 51-75%, 76-95%, 96-100%. The EPMT program has established that the area coverage is the extent of the area that a plant occupies over the ground, i.e. the area covered by the plant's shadow when the sun is straight overhead. Visualize a hand with outstretched fingers represents a plant with multiple stems; the area coverage would include the area between the fingers, just about a perfect circle. This is much easier to do with small areas than with large ones, so start by practicing with small patches and be conservative with estimates (i.e., do not 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.
Stem_Count	Numeric	A stem count of the dominant invasive species. Only enter a value when there is a relatively accurate count of individual plants. If the action is a control event, this is much easier since each person can count the number of plants controlled. If the action is not a control event, do not record a value over 100 unless all it is certain that all plants were counted. If controlled plants are not counted, leave the field with the default, -9, which indicates no plants counted. A zero should only be used if there are no plants found.
CntrlEffrt	Menu	The amount of effort required to control the infestation. For planning and evaluation, it is helpful to have a relative indicator of the control effort required. This can be projected if the infestation is not controlled or actual if it is. <ul style="list-style-type: none"> • Low = infestation could be manually controlled by one person in less than an hour • Medium = infestation could be controlled by one person in less than an 8 hour day • High = infestation would require multiple people or multiple days to control
Action	Menu	<ul style="list-style-type: none"> • Inventory = any visit to a particular infestation where no treatment action occurs • Manual Treatment = control effort pulling or digging by hand • Mechanical Treatment = control effort like mowing, weed-whacking, chain-sawing, etc. • Chemical Treatment = control effort with the use of herbicides
%_Treated	Menu	Percentage of area treated – 1-5%, 6-25%, 26-50%, 51-75%, 76-95%, 96-100%. Make notes in comment field what was/wasn't treated. For example, removed all flowering plants or many seedlings left. The vast majority of treatment actions should be 96-100% treated.
Control_pers_hrs	Numeric	The actual total person hours spent for all people involved. This is the number of people involved multiplied by the time spent on the action. Do not estimate if it is an Inventory action – leave it as -9.
Is_Exhaustive	Menu	In general, all species should be recorded; however, if a particular species is being mapped very accurately, this option could be used to ignore other species. <ul style="list-style-type: none"> • Y = Yes, all the invasive plants encountered were recorded • N = No, only certain species were recorded and others were overlooked
Comments	Text	Use this is a 230 digit field to convey anything that seems important about the mapped area. Feel free to use shorthand as long as it intelligible after editing. Examples of what to include: <ul style="list-style-type: none"> • control might not work for a certain reason • species' identity is uncertain/not listed • who assisted with the action (ex:SAGA) • invading undisturbed plant community • apparent source of infestation • similar native species in the same area
Recorder_Name	Menu	The initials of the person using the Trimble unit. Park staff should customize this field with the initials of the most likely EPMT or park staff.
Team_Name	Menu	<ul style="list-style-type: none"> • AKEPMT = EPMT park staff performs the action alone or with help • NPS = Non-EPMT park staff performs the action • SAGA = SAGA crew performs the action – Use this if EPMT park staff line a SAGA crew out on a site for one day but the SAGA crew completes the project unassisted • Volunteer = If EPMT park staff record the accomplishment of volunteers
2Taxon 2Phenology 2%_Cover 2StemCount 2Action 2Control_Effort		There are fields for 9 additional invasive species other than the dominant species at a particular site. In general, it is preferred that each species is recorded individually with its own shape rather than using these additional fields. This option is provided to save time when there is a whole complement of species infesting the same area and there is no time to map them individually. Remember that if the extents of each species are not the same, this option should not be used and that any species with an invasiveness ranking of greater than 50 should have its own specific record. For each additional species, all fields must be entered – including phenology; percent cover; stem count; action; and control effort (see descriptions above) – using the additional fields provided.

Table 2. Description of locations for the field Location_Name.

Park	LocationID	Description
ALAG	alagnak	anywhere within the boundaries of Alagnak
ANIA	aniakchak	anywhere within the boundaries of Aniakchak
BELA	serpentine_springs	Serpentine Hot Springs and ATV trails radiating out from there
CAKR	dmts_rd	road from Red Dog Mine to port
	kakagrak_hills	abandoned military base and airstrip
	kotzebue	Kotzebue and surroundings
DENA	first_mile	park road from the entrance at the Parks Highway to headquarters, including headquarters, housing, sled dog area, etc
	kantishna	inholdings at the end of the park road after Wonder Lake
	mckinley_village	development along Parks Highway outside the boundary
	nenana_river	banks of the Nenana River
	park_rd	park road between headquarters and Kantishna
	parks_hwy	Parks Highway along boundary
	railroad	along railroad tracks, near depot, including airstrip
south_side_denali	Denali south of the Alaska Range	
GAAR	kuyuktuvuk	Kuyuktuvuk watershed, including Oolah Pass
	noatak_river	along Noatak River
	walker_lake	Walker Lake and surrounding areas
GLBA	bartlett_cove	Frontcountry area of GLBA, including lodge
	beardslees	Beardslee Islands
	dry_bay	Dry Bay and vicinity within the park boundary
	dry_bay_USFS	Dry Bay and vicinity outside the park boundary
	dundas_bay	Dundas Bay and surrounding areas
	east_arm	coastline of the East Arm of Glacier Bay
	glba_other	Other areas of park not in Dry Bay, Dundas Bay, or main Glacier Bay
	gustavus	Gustavus and surroundings
	main_bay	The portion of Glacier Bay to the south of the two arms
	tatshenshini_rvr	The portion the Tatshenshini River outside of the GLBA boundary
west_arm	coastline of the West Arm of Glacier Bay	
KATM	10000_smokes_rd	entire road leading to the Valley of 10,000 Smokes
	bay_of_islands	Area at the east end of the North Arm of Naknek Lake, including Fure's Cabin
	brooks_camp	Brooks Camp and surrounding area
	jojo_lake	Jojo Lake and surrounding area
	katm_outer_coast	anywhere along the KATM coastline
	king_salmon	King Salmon and surroundings
	lake_camp	entire Lake Camp Road, boat ramp area, and parking area
	nonvianuk	Nonvianuk patrol cabin, river, and surroundings
KEFJ	exitgl_back	Backcountry area of Exit Glacier
	exitgl_front	Frontcountry area of Exit Glacier (Road and associated developments)
	exitgl_hiker	Areas associated with hiking trails in the Exit Glacier area
	kefj_outer_coast	anywhere along the Kenai Fjords coastline
	seward	Seward and surroundings
KLG0	chilkoot_trail	The Chilkoot Trail Unit of KLG0
	dyea	Dyea and surroundings
	dyea_road	Road to Dyea and surrounding area not in park
	klondike_hwy	Klondike Highway above Skagway, except for White Pass Unit
	skagway	Skagway and surroundings

Park	LocationID	Description
	white_pass	the White Pass Unit
	white_pass_railroad	Railroad corridor outside of White Pass unit
LACL	lACL_outer_coast	anywhere along the outer coast of LACL
	port_alsworth_nps	NPS headquarters in port alsworth and surrounding areas
	port_alsworth_town	town of port alsworth and surrounding areas
	twin_lakes	anywhere around twin lakes
SITK	sitka	Sitka and surroundings
	sitka_park	Sitka National Historic Park
WRST	chitina	Chitina and surroundings
	copper_center	Copper Center and surroundings
	copper_rvr	along Copper River
	edgerton_highway	Old and New Edgerton Highway from Richardson Highway to Chitina
	forelands	coastal area of WRST
	glenallen	Glenallen and Glenn Highway
	kennicott	Kennicott (Town and Mine Site), Bonanza Ridge and Root Glacier Trails
	may_creek	NPS compound, airstrip, and surrounding roads and trails
	mccarthy	McCarthy and surroundings
	mccarthy_rd	region from Copper River bridge to Kennicott River plus ATV trails
	nabesna_rd	Nabesna Road and ATV trails
	ptarmigan_lake	the Ptarmigan Lake private inholding
	remote_airstrip	Peavine, Huberts, Tana, Jake's, C-N confluence, Chisana so far
	richardson_highway	Richardson Highway from Gakona Junction (north) to Edgerton Highway (south) , except for Copper Center
	slana	area outside of the park at the entrance to the Nabesna Road
	tok_cut_off	along Tok Cut-off from Slana to Gakona Junction
viscenter	headquarters and visitor center complex	
YUCH	coal_creek	Coal Creek Camp and surrounding areas
	yukon_river	along Yukon River
	other	DESCRIBE LOCATION IN COMMENTS

Table 3. Description of disturbances for the field Disturbance_Type.

Disturbance	Description
ABDHOME	Abandoned Homesite - anything related to a homesite
AIRSTRIP	Remote Airstrip
ANIMAL	Caribou/moose/ wild animal related disturbances
BRSHCUT	Mechanical brush or tree cutting for fuel reduction or visual purposes
COASTAL	Coastal/Beach
FLIMPRT	Fill Importation (e.g., Road or Railroad Grade)
GLACIER	Glaciation
GRAZING	Domesticated grazing disturbances
LOGGING	Logging operation above and beyond a brush cutting project
MATEXTR	Material extraction area such as a gravel pit or rock quarry
MINING	Mining operations
MOWING	Mowing
NONE	No disturbance
ORVDST	Off-Road Vehicle Disturbance (ORV), ATV trails, etc.
OTHER	Other Mechanical Substrate Alteration or Removal
PLOWING	Agricultural plowing or disking
RIVER	River Action – any disturbance involving flooding, erosion, ice scour, or deposition of substrates
SLIDE	Land Slide/Avalanche
STREAM	Stream Action – the riparian area along a stream corridor
TRAIL	Trail system
TRMPLNG	Trampling – such as along the edges of a trail
WIND	Wind Erosion/Deposition
WLDFFIRE	A wildland forest fire scar
WNDTHRW	Windthrow – an area where trees were uprooted or broken by a windstorm

Supplemental Data Dictionary Fields

Restoration

For parks engaged in restoration activities, a polygon feature should be collected to record the total number of person hours, what native species were added, and in what form the native plants were. The fields are described in Table 4. Additional fields for a revisit date and description of care/maintenance and survival rate are included, but they may be easier filled in after the fact in PFO.

Table 4. Restoration fields in the Alaska EPMT Data Dictionary.

Field Name	Type	Description
Location_ Name	Menu	The general area where the activity takes place with several possible in and around each park unit. The data dictionary has all LocationIDs already loaded in alphabetical order. See Table 3 for a description of each LocationID. To visually see the delineation of each LocationID, pull up the "EPMT Location Index" theme in NPS Theme Manager and view it via ArcMap. Alaska EPMT park staff should customize this field and arrange in the order of most common usage and delete ones that will not be used.
Disturbance_ Type	Menu	The main type of disturbance. See Table 3 for more detailed description of the disturbance types available. Alaska EPMT park staff should customize this field and arrange in the order of most common usage and delete ones that will not be used.
Site_ Description	Text	This field provides the opportunity to explain the exact area within the LocationID as well as any information about that area that might be important. This should enable someone who looks at this data to understand where within the LocationID the work took place without having to use GIS. Take the time while editing to be complete. Additionally, it should note if there is special significance in the location, such as remoteness, proximity to a stream or river, or ease of spread into other areas.
Comments	Text	Use this is a 230 digit field to convey anything that seems important about the mapped area. Feel free to use shorthand as long as it intelligible after editing.
Park_ Unit	Menu	The four-letter code for the park unit. Park staff should customize the default for this field.
Recorder_ Name	Menu	The initials of the person using the Trimble unit. Park staff should customize this field with the initials of the most likely EPMT or park staff.
Team_ Name	Menu	<ul style="list-style-type: none"> • AKEPMT = EPMT park staff performs the action alone or with help • NPS = Non-EPMT park staff performs the action • SAGA = SAGA crew performs the action – Use this if EPMT park staff line a SAGA crew out on a site for one day but the SAGA crew completes the project unassisted • Volunteer = If EPMT park staff record the accomplishment of volunteers
Person_ Hours	Numeric	The actual total person hours spent for all people involved. This is the number of people involved multiplied by the time spent on the action.
Native_ taxon	Text	Record the scientific name of the native species used during restoration.
Type	Menu	Form of the native plant being used during restoration: cutting, fruit, individual, rhizome, runner, seed, seedling, stem, or transplant.
#_ Planted	Numeric	Number of individuals planted. If seeds, describe the volume and/or weight and clarify in the comments field.
2Native_ taxon 2#_ Planted 2Type		Additional fields for 4 more native species used during restoration.
Revisit_ Date*	Date	Date of site revisit.
Care_ Maintenance*	Text	Description of any care or maintenance that occurred at the site after the initial restoration.
Survival_ Rate*	Text	Description of the survival rate of the native plants added to the restoration area.

* These fields are likely best populated in the office through PFO.

Data Dictionary Customization

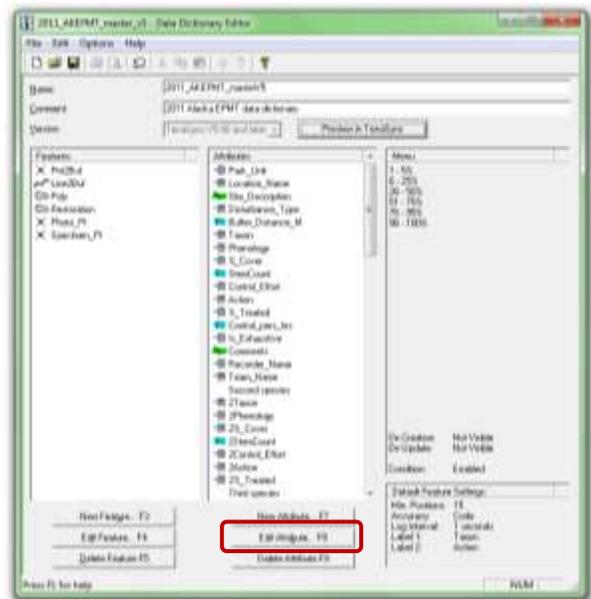
In order to help save time in the field each park should edit the Alaska EPMT data dictionary to best suit the local need. The usual fields which are edited are listed in Table 1. Each park should use one customized data dictionary throughout the season.



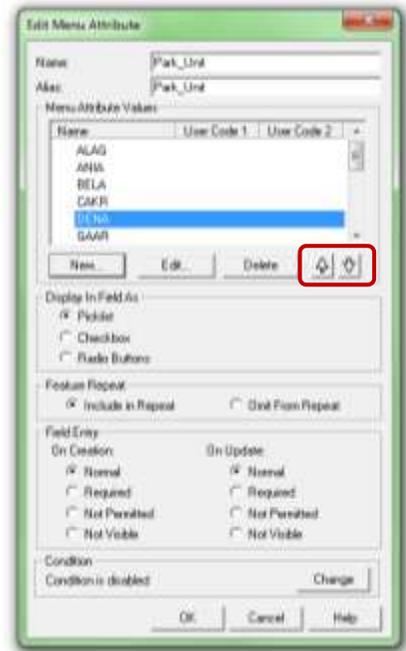
*Each park should feel free to customize the data dictionary using the following steps **as long as no feature or attribute fields are added or deleted.***

1. Save a copy of the correct version of the data dictionary to the park's local EPMT file management folder
 - For 2003 GeoXT units: [2011_AKEPMT_master.ddf](#)
 - For 2005/2008 GeoXT units: [2011_AKEPMT_master_v5.ddf](#)
2. Open the data dictionary using the PFO Data Dictionary Editor. The simplest way is to just double click on the data dictionary – the editor will open automatically if PFO is loaded on the computer.

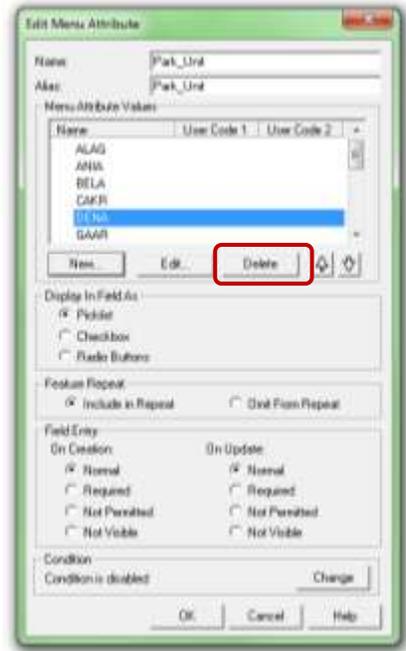
3. Double click on the desired attribute OR highlight and click “Edit Attribute” to bring up the Edit Attribute window.



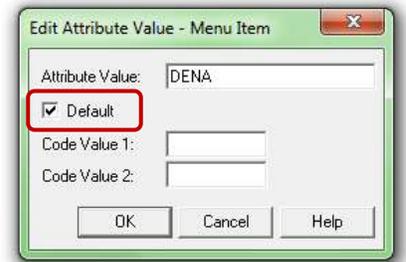
4. Arrange the attribute values so that the most commonly used values are at the top of each list. For example, a specific park code and the location IDs associated with that park should be at the top.
 - a. Highlight the desired name and using the up and down arrows in the lower right corner of the Menu Attribute Values portion of the window.



5. Delete any attribute values that will never be used in the specific park. For example, delete the initials of individuals who do not work at the park or the Location_Name of areas not at the park.
 - a. Highlight the desired name and click “Delete” at the bottom of the Menu Attribute Values portion of the window.



6. If desired set the values that are use for most records as defaults.
 - a. Double click on the desired attribute.
 - b. Double click on the value in the Menu Attribute Values list which is to be the new default.
 - c. Check the Default box on the Edit Attribute Value window and this value will be the new default for this drop-down menu.



Any attribute which is altered as described above must also be altered in all feature classes (Pnt2Buf, Line2Buf, Poly, etc).



Unlike previous years all attributes must be edited individually and not moved using the cut/paste method. This is because of the new formatting available with TerraSync 5.0 and the use of condition classes to simplify the look of the data dictionary.

7. Save the modified file with the user's initials (e.g. 2011_AKEPMT_WSR.ddf).

Data Dictionary Transfer

If possible, only use one data dictionary throughout the season. Once the data dictionary is customized for the park it must be loaded onto the GPS unit.



*These files should be transferred using the PFO Data Transfer Utility **NOT** via Windows Explorer.*

1. Connect the GeoXT cradle to a power source and to the PC workstation.



WARNING: 2003 GeoXT units should be connected to a computer via a USB hub. There have been cases of power surges from the 2003 GeoXT damaging computers. The USB hub buffers this surge.

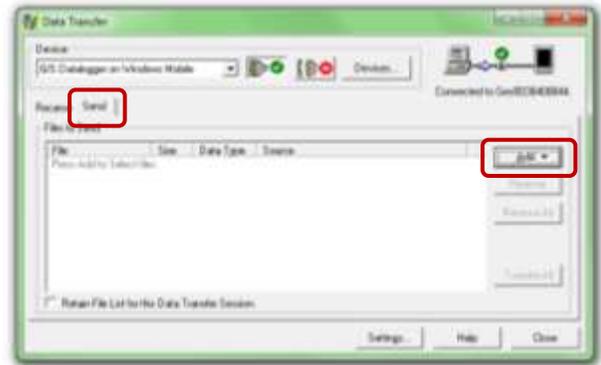
2. Turn the GPS unit on.
3. Place the GPS unit in the cradle.
 - a. Insert the top end with the antennae into the cradle first and then press the bottom onto the connection pins. These pins are fragile so try to line up the unit as well as possible and do not use too much force when placing the unit into the cradle. The unit should snap into place with a single firm push.
4. ActiveSync or WMDC should start on the PC automatically to sync with the unit. If the program does not start try reconnecting the GPS, reconnecting the cradle, or restarting the computer. If the GPS unit still does not connect contact your park GIS/GPS specialist or the Alaska EPMT regional staff.
 - a. **If you are using WMDC**, select 'Connect without setting up your device' when prompted.
 - b. **If you are using ActiveSync**, select a 'Guest' partnership when prompted.
5. Open PFO.

6. Launch the Data Transfer Utility, marked with the  button on the left side of the screen or from the Utilities menu, and connect to the GPS unit.

7. The Data Transfer Utility automatically opens in Receive mode. Select the Send tab to be able to transfer files from the computer to the GPS unit.

8. Click “Add” on the right side of the window, select Data Dictionary, and navigate to where your customized data dictionary is saved.

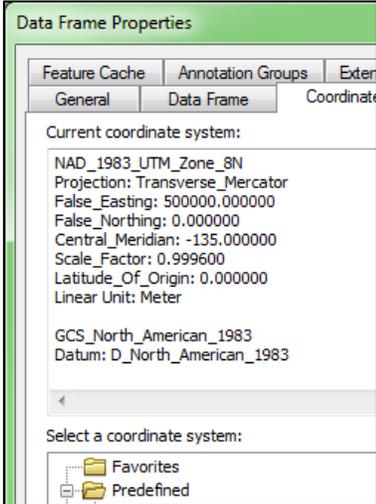
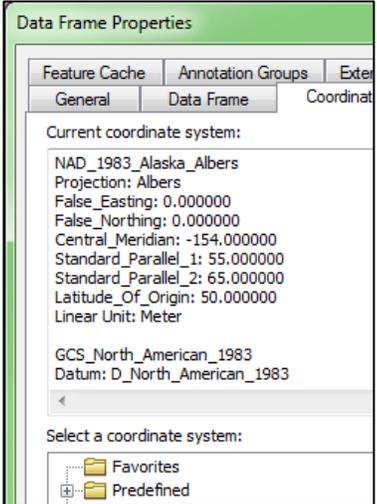
9. Click OK and then Transfer All.



Coordinate Settings

A coordinate system is a way to define a location based on measuring distance and direction. A datum is a mathematical model of the size and shape of the earth. There are numerous types of coordinate systems and datums and there is no easier way to mess up the data collection process than to have software or GPS units with the incorrect coordinate settings. Use Table 1 to ensure that all software and hardware are set to the correct coordinate settings for the park in question.

Table 4. Coordinate settings for TerraSync, Pathfinder Office, and ArcGIS.

	UTM – KLGO, GLBA, and SITK	Albers – All other Alaska parks
Terra Sync	System: UTM Zone: 8 North Datum: NAD 1983 (Conus) CORS96 Altitude Reference: Mean Sea Level (MSL) Altitude Units: Meters Display USNG: Off Geoid Model: Other Geoid: DMA 10x10 (Global) Coordinate Units: Meters	System: US Continental Zone: Alaska Albers83 (CORS 96) Datum: NAD 1983 (Conus) CORS96 Altitude Reference: Mean Sea Level (MSL) Altitude Units: Meters Display USNG: Off Geoid Model: Other Geoid: DMA 10x10 (Global) Coordinate Units: Meters
PFO		
ArcGIS	 <p>Found under Predefined/Projected Coordinate Systems/UTM/NAD 1983</p>	 <p>Found under Predefined/Projected Coordinate Systems/Continental/North America/Alaska Albers Equal Area Conic</p>

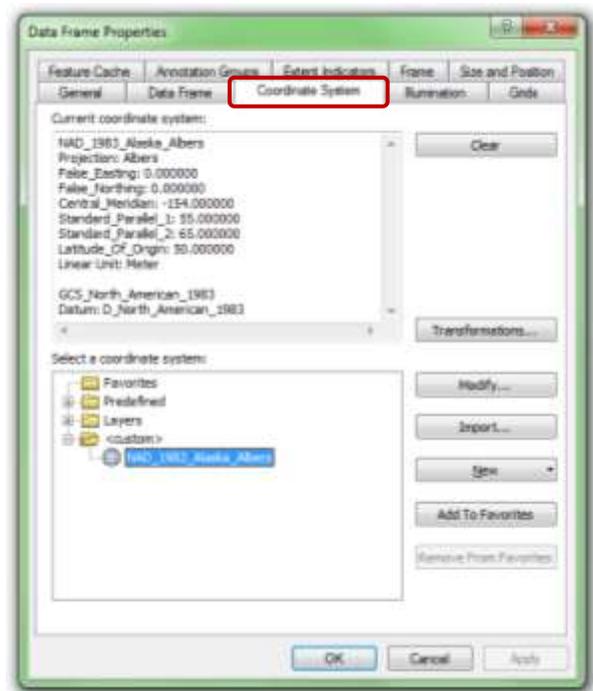
GPS Background Images

Having a background file displayed on a GPS unit or in PFO can be very helpful when navigating to a new location or verifying that data was correctly recorded. Follow these steps to create a useable background file for field use. **Note: This portion of the protocol does not review how to use ArcGIS.** For more information on how to use ArcGIS register for the NPS-GIS ELA Virtual Campus course at <http://data2.itc.nps.gov/gis/esri/vc.cfm>.

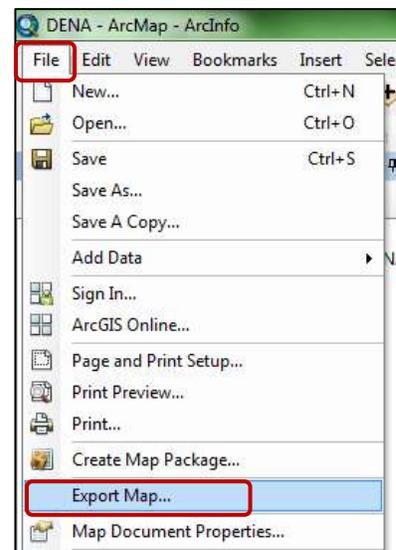
Creating a Background Image

1. Make a map in ArcGIS. Some helpful information may include a background photo, USGS topographic maps, NOAA charts, park boundaries, trails, etc.

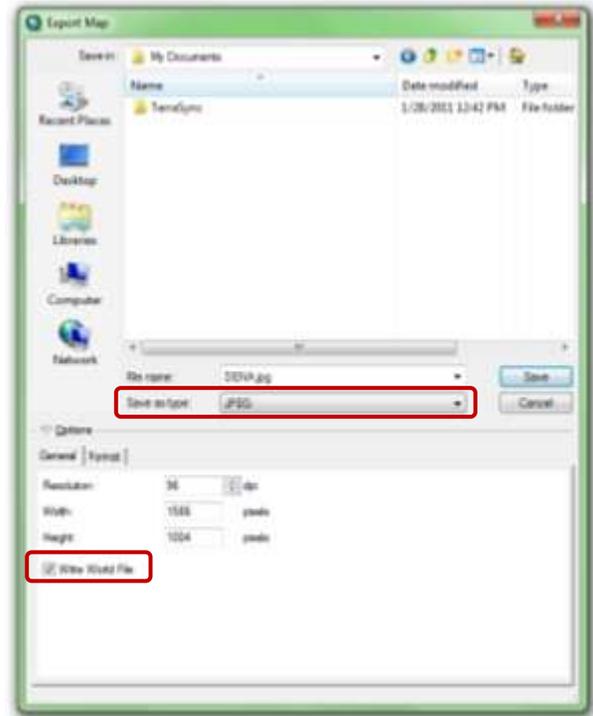
2. Open the Data Frame Properties window in one of two ways:
 - a. Double click on the Layers title in the Table of Contents.
 - b. Right click on the Layers title and select Properties.
3. Select the “Coordinate System” tab. The map should be in the projected coordinate system based on the locations in Table 1.



4. Once the data is arranged in the map and the screen has the map extent needed (zoom in and out to export what is visible in the window), select “Export Map” from the File menu.



5. Save the map as type JPEG.
6. Check the “Write World File” option.
Adding the resolution to the end of the file name will help remind you of what files are larger and smaller.

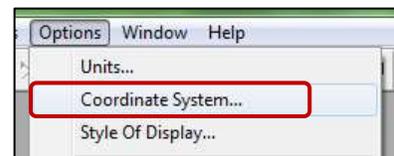


Experiment with different resolutions and qualities. Having a background image will slow down GPS unit’s map drawing, so there needs to be a balance between speed and image quality. The higher the resolution and quality, the slower the image will redraw. Since map drawing is affected by how large the map is, consider creating several smaller maps for different study areas so the GPS has less to redraw at any one time.

Testing a Background Image

Testing a background image prior to going into the field will save time and headache. Using PFO to test the image will save time versus testing the image on a GPS unit.

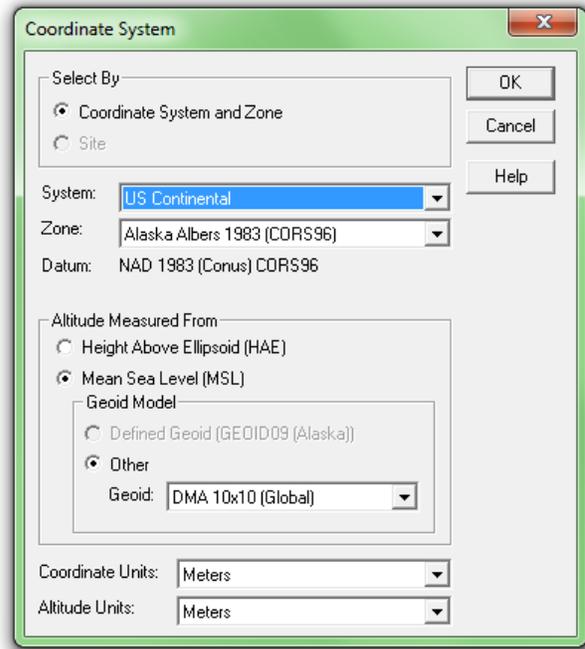
1. Open PFO
2. Select “Coordinate System” from the Options menu.



3. Define the coordinate system to match the exported map. This is only changing how the data is displayed, not how it is collected or saved. See Table 1 for the correct settings.

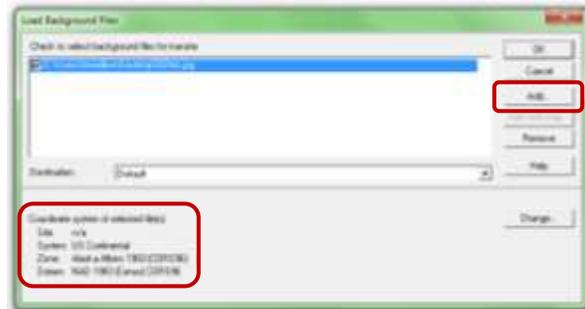
If the needed coordinate system options are not showing up, close PFO and navigate to C:\Program Files\Common Files\Trimble\GeoData and make a copy of the current.csd file and paste it in same folder. Then delete the file current.csd making sure to rename the copy back to current.csd. Re-launch PFO, and it should rebuild the file and provide the needed options.

4. Make sure “Coordinate Units” is in meters and hit “OK.”



5. Select “Background...” under the File menu.

6. Click Add and navigate to where the background image is saved.
7. Make sure the coordinate system is correct according to Table 1.
8. Click OK.



9. Open the Map view by selecting “Map” under the View menu or with the  button on the top of the screen.
10. Zoom in and out to determine if the image is large enough to suit your needs but small enough to not inhibit functionality in the field.
11. Verify the image is correctly positioned by opening a data file (.ssf or .cor) that you know is from the same area and verify that the features align with the image.

Loading a Background Image

Once you are sure a background image will work properly for your particular project follow these steps to load the image onto your GPS unit.

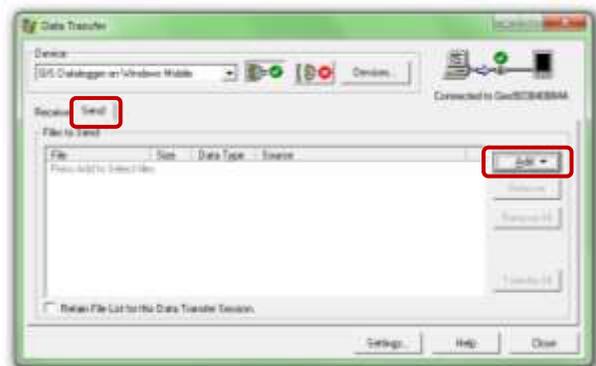
1. Connect the GeoXT cradle to a power source and to the PC workstation.



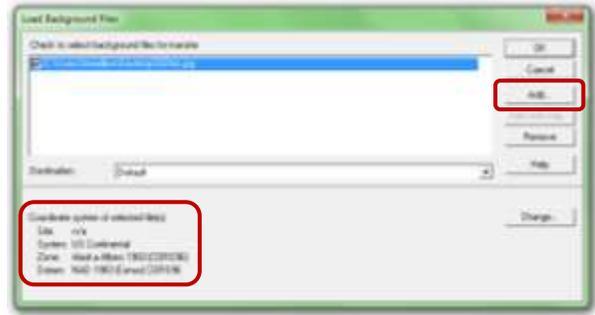
WARNING: 2003 GeoXT units should be connected to a computer via a USB hub.
*There have been cases of power surges from the 2003 GeoXT damaging computers.
The USB hub buffers this surge.*

2. Turn the GPS unit on.
3. Place the GPS unit in the cradle.
 - a. Insert the top end with the antennae into the cradle first and then press the bottom onto the connection pins. These pins are fragile so try to line up the unit as well as possible and do not use too much force when placing the unit into the cradle. The unit should snap into place with a single firm push.
4. ActiveSync or WMDC should start on the PC automatically to sync with the unit. If the program does not start try reconnecting the GPS, reconnecting the cradle, or restarting the computer. If the GPS unit still does not connect contact your park GIS/GPS specialist or the Alaska EPMT regional staff.
 - a. **If you are using WMDC**, select ‘Connect without setting up your device’ when prompted.
 - b. **If you are using ActiveSync**, select a ‘Guest’ partnership when prompted.
5. Launch the Data Transfer Utility, marked with the  button on the left side of the screen or from the Utilities menu, and connect to the GPS unit.

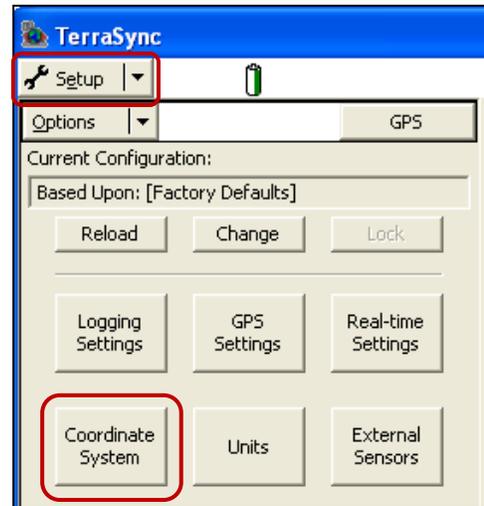
6. The Data Transfer Utility automatically opens in Receive mode. Select the Send tab to be able to transfer files from the computer to the GPS unit.
7. Click “Add” on the right side of the window, select “Background”.



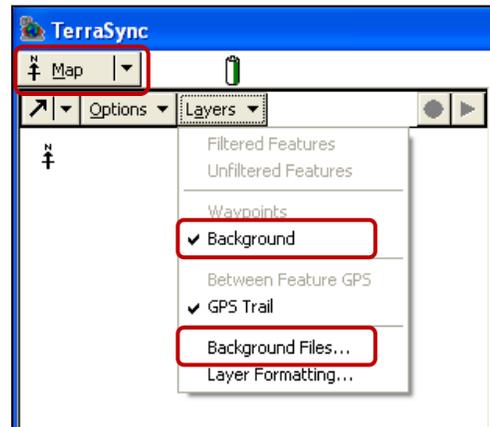
8. Click Add and navigate to where the background image is saved.
9. Make sure the coordinate system is correct according to Table 1.
10. Click OK.



11. On the GPS unit open Terra Sync.
12. Go to the Setup screen.
13. Select Coordinate System.
14. Define the coordinate system to match the background file. See Table 1 for the correct settings.



15. Go to the Map screen
16. Under the Layers dropdown make sure the "Background" option is checked.
17. Under the Layers dropdown select "Background File."
18. Choose the correct file.



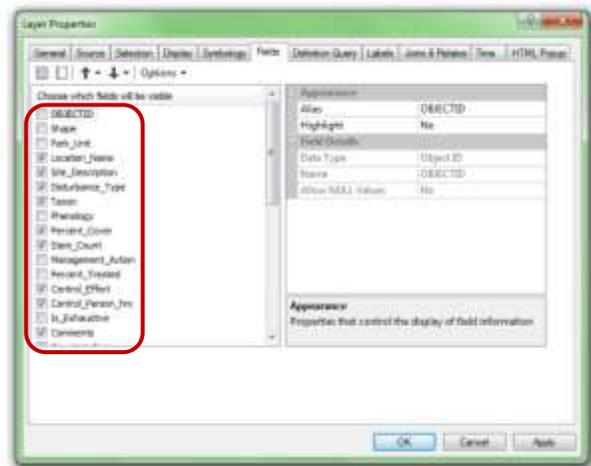
If all the coordinate systems were properly assigned there should be no error message and the image should display.

Species Data Files

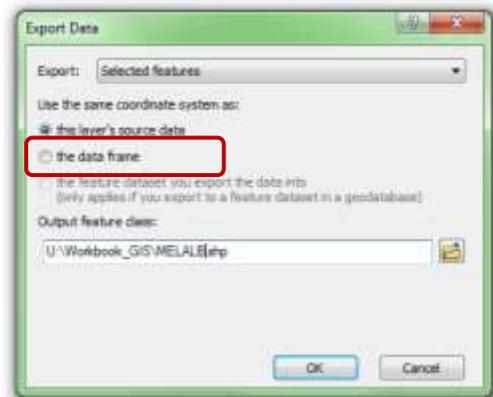
In previous seasons all historic data was used to create species data files for each park. Due to the limited use these files were receiving the field protocols now include instructions on how to put these together at the park level.

1. Open ArcMap
2. Define the coordinate system according to Table 1.
3. Open the Alaska EPMT GDB.
4. Select the data you are interested in. It is usually easiest to create these files by species – but narrow down to which year's data you are interested in or which specific area.

5. Turn off non-essential attributes. Turning off non-essential fields lowers the file size and conserves hard drive space on the Trimble units.



6. Once the desired records are selected, export the data as a new shapefile using the data frame coordinate system.



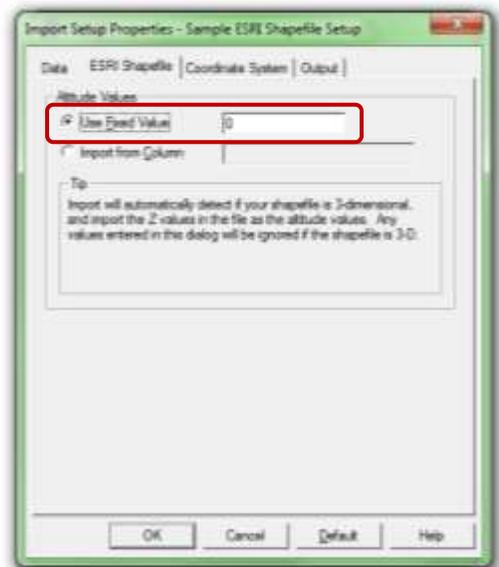
7. Open PFO

8. Launch the Import Utility, marked with the  button on the left side of the screen or from the Utilities menu.
9. Click “Properties” at the bottom of the window.

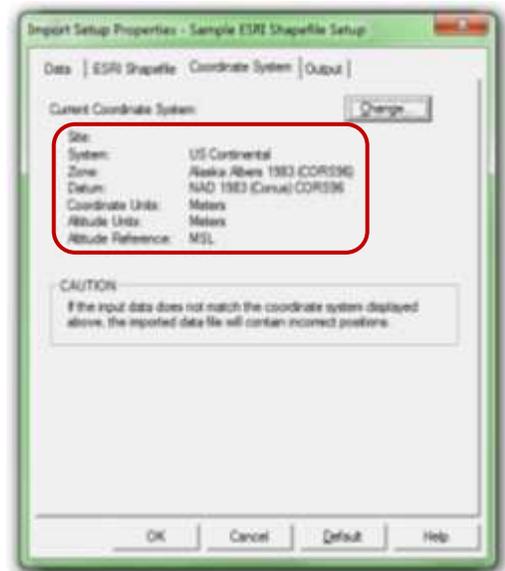


10. On the Data tab, select the “Features with Data Dictionary” radial button.

11. On the ESRI Shapefile tab, select the “Use Fixed Value” radial button and enter 0 in the field.



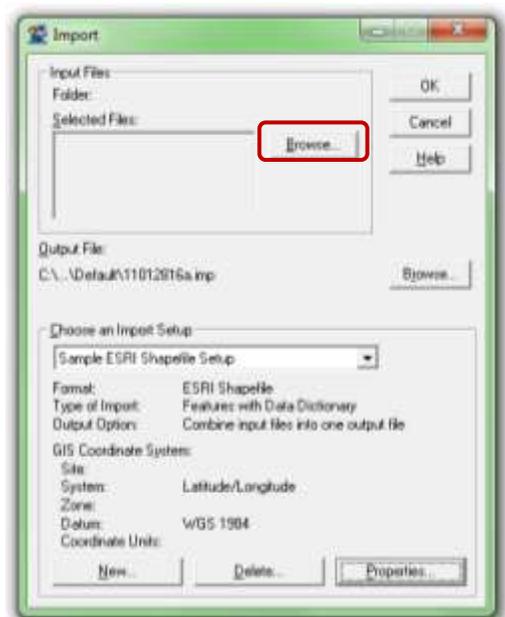
12. On the Coordinate System tab, make sure the coordinate system matches that of the data you are planning on importing. Refer to Table 1.



13. On the Output tab, select the “Create one output file for each input file” radial button.

14. Click OK.

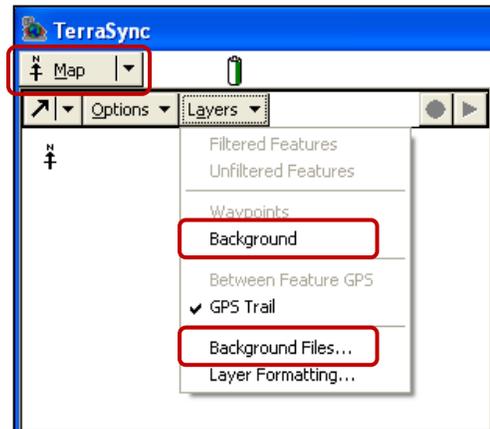
15. Back at the Import window, browse to where you saved the species shapefiles.



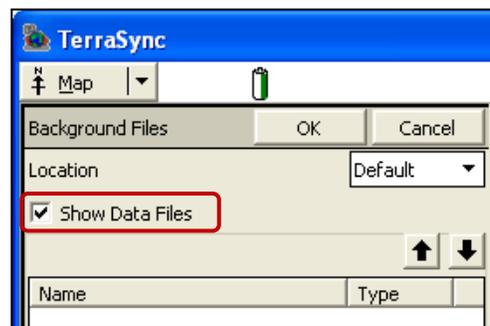
Data file as background

As a background, the polygons are visible on the TerraSync Map screen but the attribute information of the data file is not accessible. Multiple background files can be viewed at the same time, which would allow a background image plus several taxa, all while current features are being collected in a rover file.

1. Go to the Map screen
2. Under the Layers dropdown make sure the “Background” option is checked.
3. Under the Layers dropdown select “Background File.”



4. Check “Show Data Files”.
5. Select the data file(s) to display.
 - a. You can select as many files as you want but remember the more you choose to display the longer it will take for your GPS unit to refresh as you navigate in the Map screen.



6. The files are now loaded as a background image.

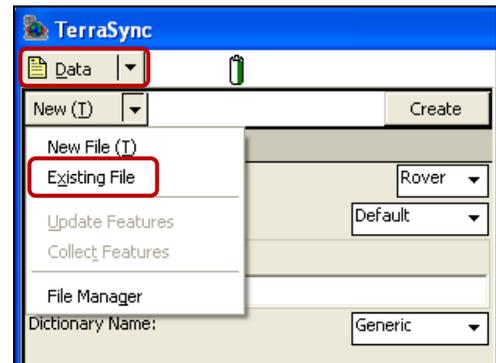
Data file as existing data file

When the data file is loaded as an “Existing File”, the polygons are visible on the “Map” screen and the attribute information is accessible. However, new features cannot be collected or other rover files opened.



Do not log positions when opening a data file in this manner as this will overwrite the data.

1. Within TerraSync, select the Data screen and “Existing File”.
2. Highlight the appropriate data file and click “Open” button.



3. Under “Options” in either the Data or Map screens, the data can be manipulated with the “Filter” function, for example by management action. The filtered polygons will display as green.
4. The Data screen will display the distance to the nearest polygons.
5. Any polygon’s attributes can be opened by highlighting it on the Data screen and selecting “Begin.”
6. From the Map screen, a polygon can be selected using the “Select” arrow from the upper left menu. This will display the summary labels. By selecting “Update Selected Feature” from the “Options” menu, all of the polygon’s attributes can be seen. **Do not log positions since this would change the data.**
7. To collect new features, return to the “Data” screen, “Close” the data file, and reopen a rover file or begin a new rover file.

Collecting GPS Data

When assessing an infestation of invasive plants, the first question to ask: 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 may result in a more accurate representation of the infestation but it also takes significantly more time. Time can be saved by mapping certain infestations as points or lines and using a “buffer distance” that will be used by the Alaska EPMT regional staff to create polygons. The buffer distance should **always** be measured in meters.

As a region wide priority, map all species with a ranking greater than 50 at a higher precision. The Alaska EPMT needs to have more precise information on distribution and extent of these highly invasive infestations for planning alternative, non-manual treatments. For example, if while mapping a line feature of pineapple weed along a trail a small patch of yellow toadflax is discovered – instead of lumping the yellow toadflax infestation data into the line feature a new point feature should be recorded of just the toadflax.

In addition to mapping existing infestations, areas which are inventoried or monitored with no invasive species found should also be documented. This is critical baseline data since the absence of invasive plants is just as valuable as the presence of invasive plants. Use the “none” or “0” option for data fields to record the absence of invasive plants.

Points

Use points on a very small patch of plants in a general circular shape. Use a “buffer distance” representing 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 trail, roadside, shoreline, or similar edge. Walk the midline of the patch with 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 should be used to map most infestations of species with an invasiveness ranking of greater than 50, in order to provide sufficient precision to be able to document short-term changes in patch shape.

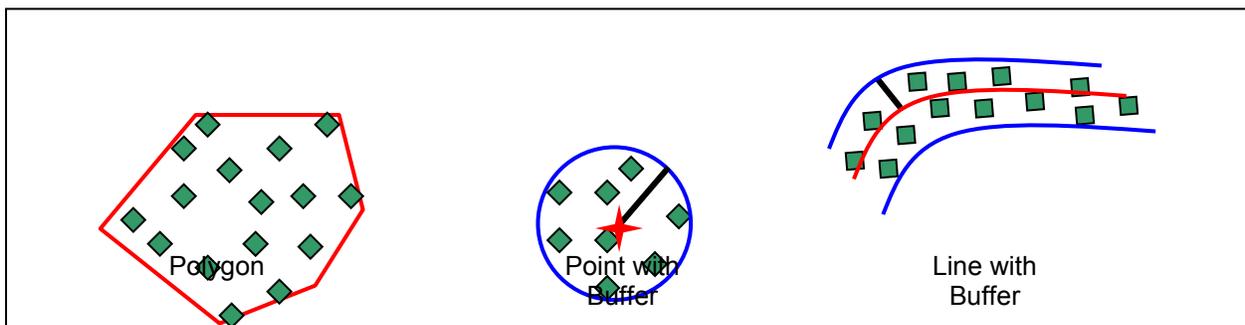


Figure 5. The three feature types (in red) for mapping infestations (in green) are displayed with, if applicable, the buffer distance (in black) and the completed buffers (in blue).

General Tips for Using the GPS

1. If not using an external antenna, hold the GPS unit at chest height or higher and away from the body while recording a feature so the GPS antenna can “see” more sky. Wherever it is held be sure to double check the “Antennae Height” setting on the unit.
2. If mapping an infestation in an area with a heavy vegetative canopy consider using an external antenna. Be sure to double check the “Antennae Height” setting on the unit.
3. 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 and polygons. This is the desired interval; however, when satellite availability is marginal the 5 seconds may be too long to collect sufficient points. It is recommended to record at least 15 positions for points and enough positions for lines and polygons to delineate the shape (more around corners and curves, fewer for straight sections). In this situation, temporarily change the logging interval to 1 second.
 - While in the Data screen, select “Options”> “Logging Interval”
 - Change the “Logging Interval” to “1s”
 - When good satellite coverage resumes, readjust the interval to “5s”
4. 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 (different location, different crew, etc) is in a separate rover file.
5. GPS units have a “Pause” function to stop the recording of positions temporarily while the feature is still open. This is helpful when maneuvering around an object or obstacle without mapping the deviation. The “Pause” button appears at the top right of the Map screen as a green arrow or pause symbol, depending on the activity at the time.
6. If mapping a large area with multiple common species (such as a long road) and suddenly stumble upon an unusual species, the unusual species should be mapped more accurately than simply lumping it into the larger polygon. In this case, stop the existing feature, map the specific feature, then resume the original feature. If the new feature will be a point (including photo point or collection), then use the “Nest” option:
 - Pause the original feature being collected.
 - Within the Data screen, select “Options” > “Nest” > and select appropriate feature type.
 - Record the new feature.
 - When the new feature is complete hit OK and the original feature which was paused will return to the screen.

If the new feature will be a line or polygon, then stop, map the new one, and resume:

- Stop the original feature by clicking “OK.”
- Map the new feature and close it like normal.
- To resume the original feature, go to the feature type menu and switch from “Collect” to “Update Features.”
- Select the feature to resume. It is probably the second feature listed. There is a comment bar along the bottom of the screen that will help differentiate.
- Click “Begin” followed by “Log.”

- Select “Continue Feature (Append)” to continue adding points to the original feature.
 - To collect new features, go to the feature type menu and switch from “Update” back to “Collect.” Only recent features can be updated in this manner, so do not map multiple new features and plan to return to the original feature.
7. Turn on/off sounds when collecting positions
 - On the Start Menu tap on “Settings”
 - On the “Personal” tab, select “Sounds and Notifications”
 - On the “Volume” tab, check “Programs” and “Notifications” and adjust the volume bar.
 8. Offset feature. In general, all features should be mapped as exactly as possible. However, this might not always be possible due to satellite coverage (e.g., under trees, next to a building) or physical barriers (e.g. river, fallen trees). In these cases, it is possible to map a set distance away from the target and then set the offset and direction. The offset applies to the whole feature, so plan ahead.
 - With the feature already open and paused, select “Offset” from the “Options” menu.
 - For a line or polygon, the direction is the direction the target is from the recorder as the segment is walked. The horizontal distance is the distance of the line being walked from the targets edge.
 - For a point, there are 5 options: Distance-Bearing, Distance-Distance, Triple Distance, Bearing-Bearing, Triple Bearing. See this [Quick Start](#) file for more information.

Monitoring

At the very least all control sites from previous years should be monitored and retreated this summer. This will allow the team to determine which treatments are working and which are not. Ideally, any documented infestation should be monitored whether or not it has been treated. It is generally recommended for any invasive plant control that the site be monitored several years into the future due to the potential for re-sprouts from the seed bank. For control sites where there are invasive 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.

Using Map Screen

On the Map Screen the previously recorded polygons and the current GPS position are all visible. As the recorder walks a trail will be displayed. This can be used to determine the proximity to the desired polygon. If this is not enough there is the Nav Target option:

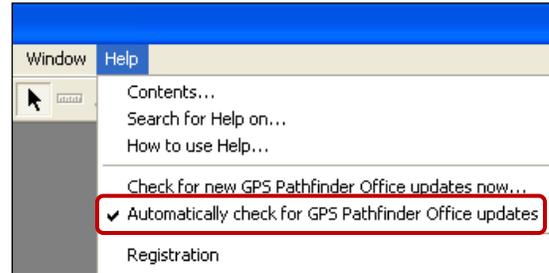
1. In the Map Screen select the “Options” menu.
2. “Nav Start” should be “GPS,” which is the current position. A single flag will appear on the Map Screen.
3. Click the destination on the screen and then select “Nav Target” as “Map Point.” Two crossed flags will appear Map Screen. Alternatively, the “Nav Target” can be set to the polygon desired if the data file has been opened in the Data screen. By selecting the polygon, under “Options” the target can be set as either the “Start/End” or generally better the “Centroid.”
4. The blue line connecting these two locations is the direct path. Under “Options”, selecting “Cross-Track Light Bar” will display a bar at the top of a map that will indicate the relative direction of travel needed to get to the target. However, this only works when moving.

Using Navigation Screen

Set the “Nav Start” and “Nav Target” as described above. The “Navigation” screen will display a number of variables of the GPS position relative to the target, including distance, heading, bearing, etc. The cross-track bar will display on the top as well to show relative direction of travel needed. The central circle also shows the desired path. While moving and holding the GPS unit in front, the arrow within the central circle will point in the desired direction.

Processing GPS Files

All GPS data collected this summer will be processed using PFO software, Trimble’s desktop data management software. At the beginning of the season, make sure the software is correctly updated and that it is set to automatically check for updates. Depending on the park’s administrative computer settings, automatic updates may not be possible. Talk to your local park IT staff for assistance.

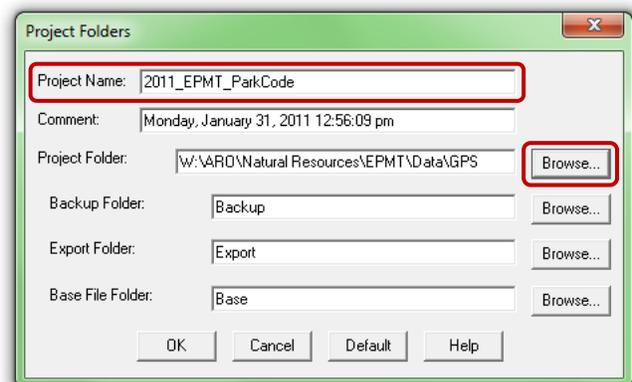
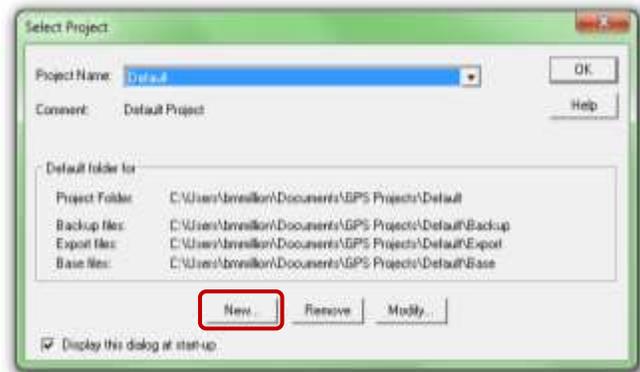


All GPS and photo data must be edited and uploaded to the [Alaska EPMT regional folder](#) under a folder with your park code. Please upload all data produced in the preceding two weeks by the end of each pay period throughout the summer. This will ensure that the data is being processed correctly, in a timely fashion, and it can be processed and uploaded into the national and statewide databases so the information is available for use throughout the season. For the 2011 season the upload dates are:

June 3	July 15	August 26
June 17	July 29	September 9
July 1	August 12	September 23

Setting up a Project

1. Open PFO.
2. The first time GPS files are downloaded for the season; create a new project for the park by selecting the “New” at the bottom of the Select Project window, which should open automatically every time PFO is opened.
3. Give the Project Name the title “2011_EPMT_park code”
4. Browse to your local park file management structure: ... \Data\GPS\2011. PFO will automatically create three new folders within the project folder location – Backup, Base, and Export.



5. Click “OK”
6. Click “Yes” when it asks, “Folder already exists. Do you want to continue?”
7. In Windows Explorer, create one more folder named “Edited COR” within the same project folder.
8. For the rest of the season, select this 2011_EPMT_(park code) project name from the drop down menu that appears in the Select Project window.

Transferring Rover Files

Transfer the GPS rover files (.ssf) from the GPS unit to the project folder as soon as possible after data collection.

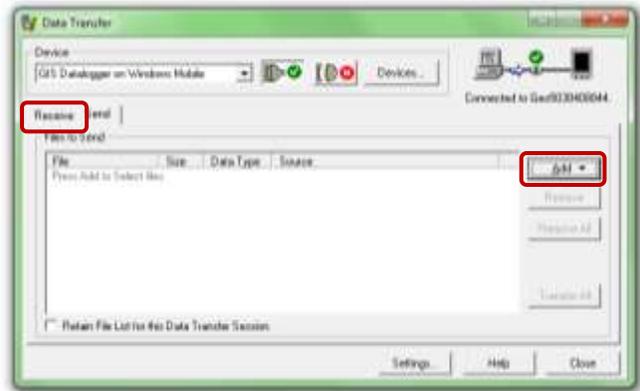
1. Connect the GeoXT cradle to a power source and to the PC workstation.



WARNING: 2003 GeoXT units should be connected to a computer via a USB hub.
There have been cases of power surges from the 2003 GeoXT damaging computers.
The USB hub buffers this surge.

2. Turn the GPS unit on.
3. Place the GPS unit in the cradle.
 - a. Insert the top end with the antennae into the cradle first and then press the bottom onto the connection pins. These pins are fragile so try to line up the unit as well as possible and do not use too much force when placing the unit into the cradle. The unit should snap into place with a single firm push.
4. ActiveSync or WMDC should start on the PC automatically to sync with the unit. If the program does not start try reconnecting the GPS, reconnecting the cradle, or restarting the computer. If the GPS unit still does not connect contact your park GIS/GPS specialist or the Alaska EPMT regional staff.
 - a. **If you are using WMDC**, select ‘Connect without setting up your device’ when prompted.
 - b. **If you are using ActiveSync**, select a ‘Guest’ partnership when prompted.
5. Open PFO
6. Launch the Data Transfer Utility, marked with the  button on the left side of the screen or from the Utilities menu, and connect to the GPS unit.

7. The Data Transfer Utility automatically opens in Receive mode. On the Receive Tab click “Add” and then “Data File”.
8. Select all the files needing to be transferred.
9. Click “Transfer All.”
10. Back up your rover files immediately in the project Backup folder.



Differential Correction

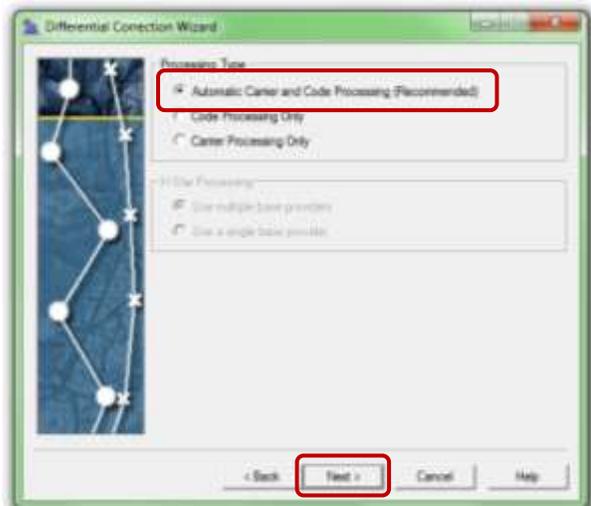
Every rover file should be differentially corrected to improve the accuracy of the data. Files should be processed individually to get the quality control values for the rover log spreadsheet (see Rover File Log Process section on page xx)

1. Launch the Differential Correction Wizard, marked with the  button on the left side of the screen or from the Utilities menu.

2. Click the plus sign to add the SSF files to correct.
3. Click “Next”

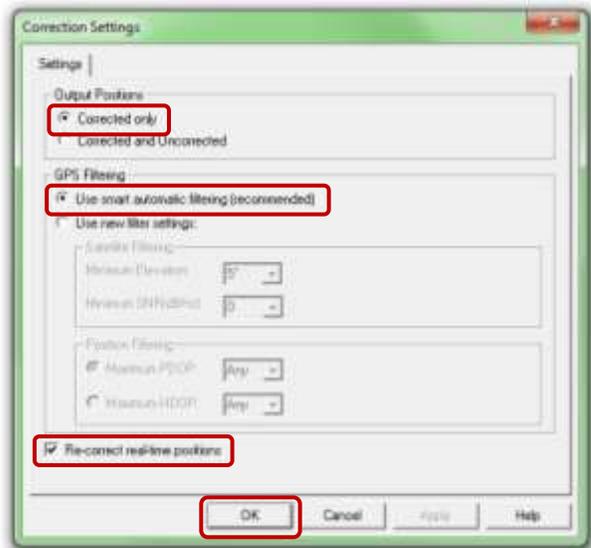
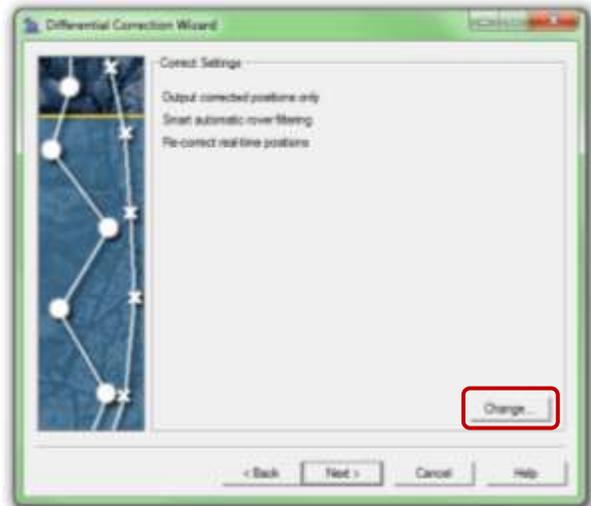


4. Select the “Automatic Carrier and Code Processing” radial button.
5. Click “Next”

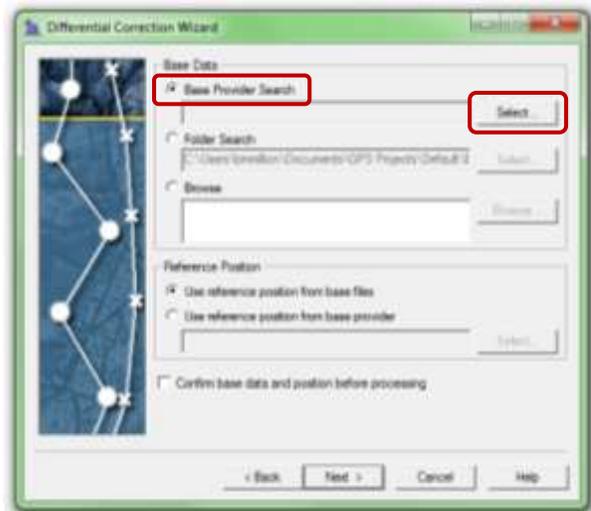


Step 6 and 7 lays out the options that should be selected in the Correction Settings window. **Once these steps have been completed once they should be saved for all subsequent exports and there is no need to repeat them.** Skip to step 8 if you are sure the Correction Settings are properly set up.

6. Click Change to double check that the settings are correct:
 - a. Select the “Corrected only” radial button.
 - b. Select the “Use smart automatic filtering” radial button.
 - c. Check the “re-correct real-time positions” box.
7. Click “OK”



8. Click “Next”



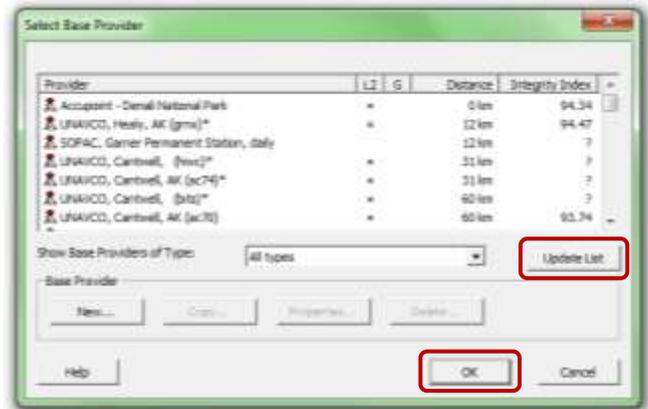
9. Select the “Base Provider Search” radial button.
10. Click “Select...”

11. Click “Update List” to periodically update the base provider list.

12. Select the closest CORS station. If one is not available up to 300km away select the closest UNAVCO.

Talk to your park GIS/GPS specialist or the Alaska EPMT regional staff if there are questions about which to select.

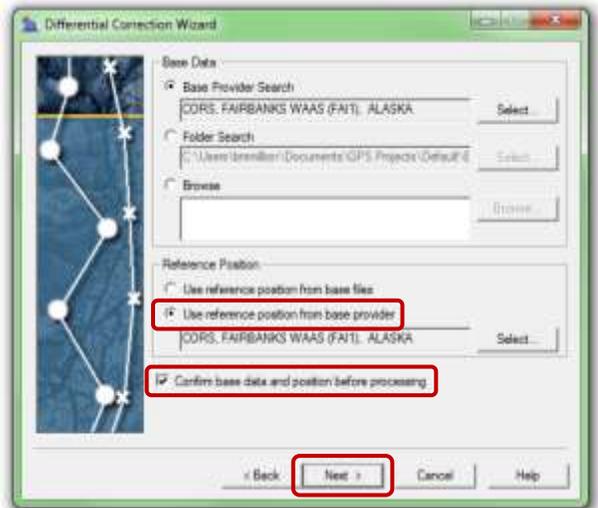
13. Click “OK”



14. Select the “Use reference position from base provider” radial button.

15. Check the “Confirm base data and position before processing” box.

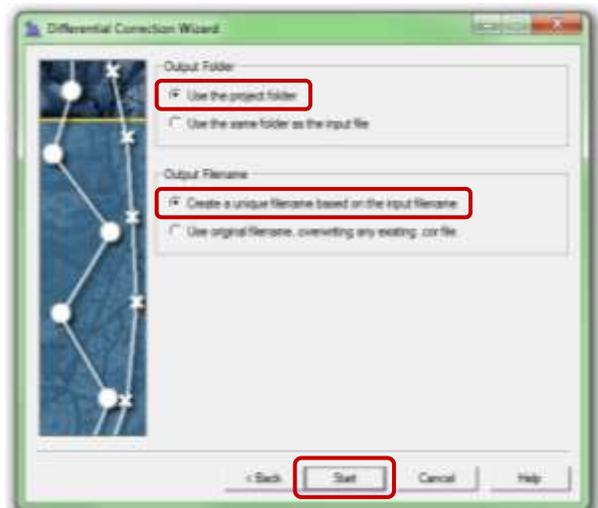
16. Click “Next”



17. Select the “Use the project folder” radial button.

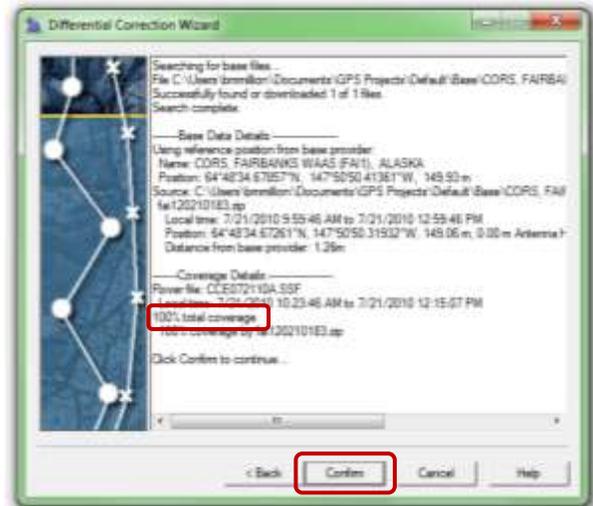
18. Select the “Create a unique filename based on the input filename” radial button.

19. Click “Start”



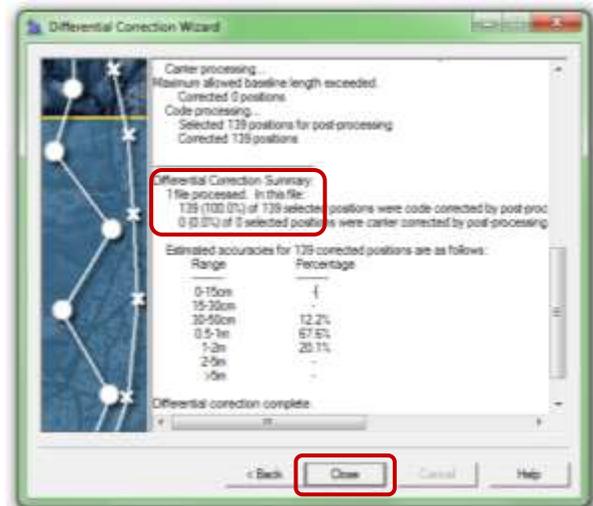
20. The Wizard will then run a test of the base station. Make sure the Coverage Details show 100% total coverage of your SSF file.

- If it does click “Confirm”
- If there is not sufficient coverage or the base station is not available click “Back” and repeat from step 12 with a different base station.



21. Make sure the summary shows 100% of the positions are corrected or at least over 90% corrected.

- If it does click “Close”
- If there is not sufficient coverage click “Back” and repeat from step 12 with a different base station.



22. Assuming good differential correction (ideally over 90%), fill out the [rover file status log](#) using values that appear at the end of differential correction or that are saved in a text file in the project folder (Figure 6). See the Rover File Log Process section on page xx. This file is critical for Alaska EPMT regional staff to troubleshoot issues at the end of the season.

```

-----
Differential Correction Summary:
1 file processed. In this file:
  1265 (94.1%) of 1345 selected positions were code corrected by post-processing
  0 (0.0%) of 0 selected positions were carrier corrected by post-processing

Estimated accuracies for 1265 corrected positions are as follows:
  Range      Percentage
-----
  0-15cm    -
  15-30cm   -
  30-50cm   -
  0.5-1m    -
  1-2m      100.0%
  2-5m      -
  >5m       -

Differential correction complete.
  
```

Figure 6. Differential Correction Summary text file.

23. If the file did not correct well:

- Try other nearby base stations. Select the closest CORS station. If one is not available up to 300km away select the closest UNAVCO.
- Wait a few hours and try again. The base station files may need to be updated.
- Contact the Alaska EPMT regional staff. We may be able to download files manually.
- If the GPS data was collected with WAAS it may be sufficient without correction.

Editing Files

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

1. Copy the corrected files from the project folder into the Edited COR folder and add the prefix “edited_” to the beginning of each file name. For example, R051015A.cor becomes edited_R051015A.cor. Copying and renaming the file before editing ensures that the original corrected file is not overwritten with the editing process.
2. Open PFO.
3. Check the validity of positions, once differentially corrected, to make sure they match what was recorded in the field. Using a background image will help with this.
4. For point features, click “Delete” in the Feature Properties window to see that the positions are a reasonably tight cluster. The “Delete” does not delete positions but it gets rid of the feature grouping the positions. Random points may need to be deleted using the “Delete” in the Position Properties window, such as points more than a few meters from the center of a point where the recorder may have inadvertently walked away while still collecting positions. Once the feature looks good, click “Undelete” in the Feature Properties window to regroup the positions.
5. For a line or polygon, positions that double back or cause loops in the feature will need to be deleted. Generally the positions with the highest value in “Horiz. Precision” should be deleted since they have the most likely error.
6. Document position deletions in the [Rover File Log spreadsheet](#). See the Rover File Log Process section on page xx.
7. If a feature was recorded as the wrong type (e.g. line collected as point), contact the Alaska EPMT regional staff for assistance.
8. Review the attributes attached to each features to check that the information is accurate and complete.

9. Elaborate on location descriptions or comments and eliminate any bad data. If there are any shorthand comments now is the time to convert it to complete thoughts. Anything in the comments field will be viewable by the public, so make them understandable and appropriate for all audiences. Species can be abbreviated by using the first three letters of the genus and species. For example, *Leucanthemum vulgare* would be leuvul.
10. Take the necessary time to make the data as finished and complete as possible. These files will be transformed into GIS data at the end of the season for anyone to peruse. Are any attribute fields blank? Are all the attributes correct? Do they make sense?
11. In the project folder, maintain the [Rover File Log spreadsheet](#) (See the Rover File Log Process section on page xx). Save the spreadsheet locally with the park code as a prefix to keep track of which rover files still need to be edited. List any issues, deletions, deviations from the protocol, or field notes recorded for each rover file.
12. Copy the Edited COR files into the project Backup folder.

All GPS and photo data must be edited and uploaded to the [Alaska EPMT regional folder](#) under a folder with your park code. Please upload all data produced in the preceding two weeks by the end of each pay period throughout the summer. This will ensure that the data is being processed correctly, in a timely fashion, and it can be processed and uploaded into the national and statewide databases so the information is available for use throughout the season. For the 2011 season the upload dates are:

June 3	July 15	August 26
June 17	July 29	September 9
July 1	August 12	September 23

13. Once all edited files are complete, let the Alaska EPMT regional staff know and they will transform the files into GIS shapefiles to ensure consistency among park units. The shapefiles will be sent back to each park to assist with preparing your park annual summary report (See the Annual Summary Report section on page XX).

Whitney's Editing Strategy – I think it's most efficient to first look at the shapes of all the features and do the necessary deletions of positions to make the shapes true to life. I'll do this for the entire cor file. I then start at the beginning again and quickly flip through the features looking at the attributes for blank data fields (yes, even I sometimes forget to populate a field). I populate the field if I can accurately recall what it should have been. I then start at the beginning for the last time to carefully review the attribute information, replace any shorthand, and otherwise clarify comments. This strategy works for me to assure the spatial and attribute data get the attention they both need.

Rover File Log Process

Each park should maintain a rover file log to assist the Alaska EPMT regional staff with the post-processing of the season's data. A spreadsheet, [Park RoverFileLog_2011.xlsx](#), includes all of the required fields needed for this process. This spreadsheet has been formulated and protected to try and prevent any confusion. All blue fields will automatically be populated. If there are any questions on the process or issues with the spreadsheet, please contact the Alaska EPMT regional staff.

All GPS and photo data must be edited and uploaded to the [Alaska EPMT regional folder](#) under a folder with your park code. Please upload all data produced in the preceding two weeks by the end of each pay period throughout the summer. This will ensure that the data is being processed correctly, in a timely fashion, and it can be processed and uploaded into the national and statewide databases so the information is available for use throughout the season. For the 2011 season the upload dates are:

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The log is relatively straight forward. Table 6 describes the fields that should be filled out on the time log spreadsheet. The rover file spreadsheet has been formulated and protected to try and prevent any confusion. Green fields are available for data entry. Blue fields will automatically be populated.



*Any fields which require entry will turn red once data entry begins. **Be sure that the log contains no red cells prior to the regional upload.***

Copy the spreadsheet [Park RoverFileLog_2011.xlsx](#) to the park's local EPMT file management folder and change "Park" to your park's four digit acronym.

It is recommended that this spreadsheet be opened and updated at the same time that spatial data is edited in Pathfinder Office. If there are any questions on the process or issues with the spreadsheet, please contact the Alaska EPMT regional staff.

Table 6. Rover File Log spreadsheet fields.

Field Name	Description
Filename	Name of the rover file being transferred, corrected, and edited.
Transfer Initials	The three digit initials of the individual transferring the rover file. This drop-down menu can be edited before the season begins to reflect only the individuals working in the park.
Date of Transfer	The date the transfer took place. mm/dd/yyyy format
Base Station Used	Name of the base station used for the differential correction.
# Original Positions	The number of positions in the uncorrected rover file. This can be found in the Differential Correction Summary text file.
# Corrected Positions	The number of positions in the rover file that were corrected. This can be found in the Differential Correction Summary text file.
% of Positions kept after correction	This field is automatically populated.
0-15 cm 15-30 cm 30-50 cm 0.5-1 m 1-2 m 2-5 m >5 m	Enter the percent of corrected positions which fall into each of these estimated accuracy ranges. This can be found in the Differential Correction Summary text file.
Editor's Initials	The three digit initials of the individual conducting any editing to the file. This drop-down menu can be edited before the season begins to reflect only the individuals working in the park.
Date Edited	The date the edits took place. mm/dd/yyyy format
Edited/Reviewed Descriptions?	Yes or No. This field serves as a reminder for what data needs to be revisited by the editor.
Positions Checked?	Yes or No. This field serves as a reminder for what data needs to be revisited by the editor.
Positions Deleted?	Yes or No. This field serves as a reminder for what data needs to be revisited by the editor. If any positions were deleted explain why in the comments field.
Issues/Comments	Include information about anything in the process that was unusual or why any positions were deleted.

Historic Alaska EPMT Data

Accessing the historic Alaska EPMT data for each park is a valuable tool in understanding the invasive weed situation at each park. While this protocol does not go into detail on how to use ArcGIS, it does walk through the steps needed to access this historic data:

1. Open a new map in ArcMap.
2. Select the NPS arrowhead logo from the Theme Manager Toolbar.
3. Load either park specific data or all of the regional data (see Figure 7) by dragging the filenames into the ArcMap Table of Contents.
4. Information about the polygons can be found using “Identify” or selecting the polygons and looking at the “Attribute Table.” Note: the themes may not work in earlier versions of ArcMap, so upgrade to at least ArcGIS 9.3, if not 10.

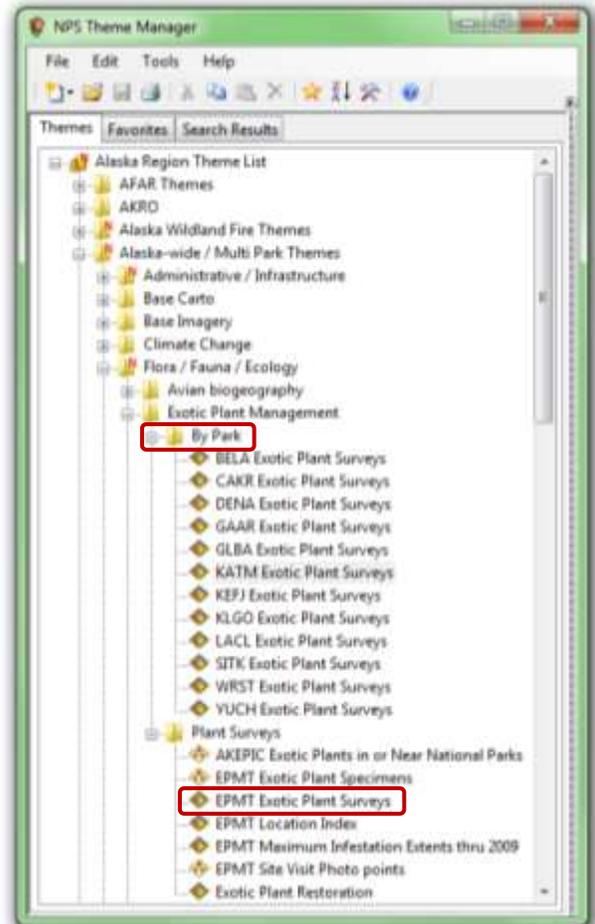


Figure 7. The location of historic Alaska EPMT data in NPS Theme Manager.

Photo Management

This season Alaska EPMT staff will be working in some of the most scenic areas in the entire country. The urge to take numerous photos can very well be overwhelming and all staff members are actually encouraged to give in to this urge. Photos are an excellent tool for invasive plant management. Photos help the program not only visually document infestations and on-the-ground management efforts for internal purposes but they also convey to others the issues Alaska parks are facing and those natural areas which the team is working so hard to protect. Several excellent photo opportunities include:

- Before and after photos of infestations that are controlled
- Volunteer events
- Any data collection work in action
- New or uncertain species, or particularly nasty infestations
- Close-up shots of particular species to aid in identification
- Restored plant communities
- Education and outreach events
- Alaska EPMT staff working with invasive plants



BEFORE GOING INTO THE FIELD: *Make sure the camera's date and time settings are accurately set. This will save time and headache when organizing photos.*

All GPS and photo data must be edited and uploaded to the [Alaska EPMT regional folder](#) under a folder with your park code. Please upload all data produced in the preceding two weeks by the end of each pay period throughout the summer. This will ensure that the data is being processed correctly, in a timely fashion, and it can be processed and uploaded into the national and statewide databases so the information is available for use throughout the season. For the 2011 season the upload dates are:

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Managing Photos

In an effort to not be overwhelmed by the sheer number of photos, it is recommended that photos are managed – meaning uploaded, organized, and the deletion of useless or repetitive photos – at least at the same time that spatial data is edited in Pathfinder Office. Ideally, digital photos should be initially reviewed on a daily basis. To smooth the process consider the follow photo management suggestions:

- Delete any photos that are unusable – blurry, etc.
- Delete any photos that are repetitive. While having multiple photos of an event is useful, strive for quality over quantity.

- Maintain folders by event, such as 20110621_WeedPull, under the EPMT_parkcode\Data\Images\2011 folder in your park file management system. This will allow park and Alaska EPMT regional staff to locate a photo with greater ease.
- Rename the photos according to the following naming structure:
YYYYMMDD_ParkCode_location_00

YYYYMMDD = the date the photo was TAKEN - four digit year, two digit month, and two digit day. This will ensure that 1) the date the photo was taken is not lost if/when a photo is edited and 2) since this date is at the front of the file name with the year first the files will be automatically organized in chronological order.

ParkCode = Four digit park code

location = a one word description of where the photo was taken. Example:

outwash – the Outwash plain in KEFJ

viscenter – the Visitor Center

skagway – in Skagway, AK

00 = Two digit number unique identifier for the number of photos taken on a specific day at the specific location. For example, the fifth photo taken in KEFJ on the Outwash Plain on June 24, 2011 would be named: 20110624_KEFJ_outwash_05.jpeg

Three ways to rename photos:

1. Pre-set the camera's file naming function
2. Enter naming strategy through Transfer Wizard (this only works if you are downloading one day at a time)
3. Batch rename using Microsoft Office Picture Manager

It is strongly suggested that you use the Picture Manager option to rename photos after all unusable photos have been deleted.

All GPS and photo data must be edited and uploaded to the [Alaska EPMT regional folder](#) under a folder with your park code. Please upload all data produced in the preceding two weeks by the end of each pay period throughout the summer. This will ensure that the data is being processed correctly, in a timely fashion, and it can be processed and uploaded into the national and statewide databases so the information is available for use throughout the season. For the 2011 season the upload dates are:

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Photo Points

It is possible to link photos to the GPS data which is collected in the field via software called GPS-PhotoLink. While this is not always necessary there are certain situations where it would be very beneficial including before and after photos of a large scale treatment effort or photos of a previously undocumented species. If there is a situation that would benefit from this use the GPS “Photo_pt” feature in the data dictionary. This data will later be coupled with GPS-PhotoLink software by the Alaska EPMT regional staff to bring the photo together with the position and attribute information.

Before taking photos

1. Set the camera’s clock as close to the GPS clock as possible (8 hours less than UTC time during AK daylight savings). Recheck this at least monthly.
2. Resolution should be set as high as reasonable given the memory card constraints. The preferred file size for a .jpg is greater than 1 MB per photo.

3. **Each day prior to taking the first photo point picture**, take a picture of the GPS screen showing the time **with seconds**. This step is **critical** for the GPS-PhotoLink software. To display the time on the GPS unit within TerraSync on the Status screen select UTC Time from the dropdown menu (Figure 8). Verify the image is legible. Be aware that the screen is very reflective and not easy to take a good picture of clearly. Holding the GPS at an arm’s length or using the macro (flower) setting when the GPS is closer may also improve the focus.

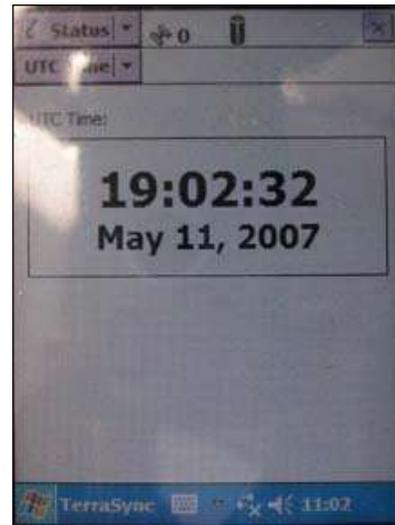


Figure 8. Screen shot of GeoXT showing UTC time with seconds. Alaska daylight savings time is 8 hours less.

When taking photos

1. **Before** the photo is taken, collect a Photo_Pt feature using the Trimble unit at the spot where the photo will be taken. Table 6 lists the fields in the Photo_Pt data dictionary.
2. After the Photo_Pt is collected, take the photo(s) standing in the same position. If the subject of the photo changes such that the description in Photo_Pt is no longer valid or the position changes, a new Photo_Pt will need to be recorded.
3. Step through the “Photo_pt” features in Pathfinder Office with an image browser window open at the same time and ensure that the attribute information is complete. If incomplete, modify the attributes to be accurate. Ensure that the image name is in the Filename field.

4. Save images that are associated with Photo_Pt features in a folder under the event folder. Example: If there are three images associated with a Photo_Pt feature collected at an outreach event on the 4th of July they would be saved at EPMT_parkcode\Data\Images\2011\20110704_Outreach\Photo_Pt
5. Always keep the original, unmodified, unedited images. **DO NOT** rotate, resize, brighten, or darken any original photo since there is a risk of losing all data embedded in the photo. Resaved any images that require editing with another name, such as [original filename]_edited.

Table 7. Photo_Pt fields in the Alaska EPMT Data Dictionary.

Field Name	Field Type	Description
Photographer	Menu	The initials of the person taking the photo point. Park staff should customize this field with the initials of the most likely EPMT or park staff.
Location_Name	Menu	The general area where the activity takes place with several possible in and around each park unit. The data dictionary has all LocationIDs already loaded and EPMT park staff should customize this field and arrange the locations in the order of most common usage. See Table 3 for a description of each LocationID. To visually see the delineation of each LocationID, pull up the "EPMT Location Index" theme in NPS Theme Manager and view it via ArcMap.
Comments	Text	Short description/title of image. Such as "Visitor Center dandelions." This description will later be watermarked onto the image with GPS-Photo Link.
Internal	Text	Longer description/comment. Such as, "Area will be treated next week." This comment will be embedded in attributes and not displayed on image. Record more specific location/event information here. This is what will give lasting value to the image.
LookDir	Menu	Direction the photo was taken in, i.e. the direction the photographer was facing while taking the picture.
Filename	Text	Record image number/file name. This may be feasible in the field or easier to edit in PFO.

Photo Contest

Each year the National EPMT program has a contest for photos to include in the National Annual Report cover and body. Having a photo selected brings the team major national bragging rights. These shots should include people (arrowheads, uniforms and other NPS symbols are always good), treatment and outreach activities, invasive plants, and great backgrounds. Staging the photo is acceptable (glacier background, wildlife, mountains). Examples of great pictures are those that tell a story about the work that the Alaska EPMT does and show the majesty of the Alaska parks. Think about the background and the subject. Figure 9 shows some great examples from the 2010 season.



Figure 9. Examples of photos from the 2010 Alaska EPMT season.

Voucher Specimens



Prior to collecting voucher specimens, check with the park research permit and collections manager to verify that the necessary paperwork and permissions are completed to conduct collections within the park.

What to Collect

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

- Any species previously unrecorded in a park unit should be collected.
- Any species that cannot be positively identified should be collected following consultation with others to ensure it is not rare. Detailed photos and a GPS point can be a good interim measure to help id the species, particularly if there are few specimens.
- Any species with a significant range expansion or found in remote areas should be collected, with priority given to species of greater concern.

In 2011, make an effort to fully collect all specimens previously reported but not collected. Refer to the spreadsheet [AK_EPMT_Master_Exotics_2011.xlsx](#) 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 NPSpecies database and may need verification with each park herbarium. Let the Alaska EPMT regional staff know of any changes needed to this spreadsheet.

Identification Process

All plant samples should first be keyed out at the park. If there are specimen collections that cannot be identified at the park level – the Alaska EPMT has an agreement with the AKNHP to assist with keying out plants. To use this service follow these steps:

1. Make sure the specimens are properly pressed and dried.
2. Package the specimens carefully and mail them to:

Dr. Matthew Carlson
Alaska Natural Heritage Program - UAA
707 A St.
Anchorage, AK 99501
3. Send an email to the Alaska EPMT regional staff to inform them the specimens have been sent.

Once AKNHP has identified the specimens they will be mailed back to the park.

Collection Process

Follow these steps to correctly collect a voucher specimen:

1. A photo should be taken of the whole plant prior to collection following the photo protocol.
2. A GPS “Specimen_Pt” should be recorded to account for as many fields as possible. See Table 8 for a description of the “Specimen_Pt” data dictionary fields.
3. Collect the specimen. 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 (the collector’s initials followed by a number – WSR001, WSR002) that relates back to the spreadsheet. Review the [University of Alaska Museum of the North’s Instructions for Plant Collecting](#) for more detailed instructions on proper plant collecting.
4. Information about the specimen collected should be recorded in the spreadsheet [parkID_Collections_2011.xlsx](#). It may not be feasible to record all fields, but an effort should be made to populate as many fields as possible using the field data associated with the “Specimen_Pt”. Fields in bold in Table 9 are required.
5. At the end of the season, obtain the accession number and catalog numbers from the park’s collections curator.
6. Verify that each specimen is identified by at least its unique collection number (the collector’s initials followed by a number – WSR001, WSR002).
7. At the end of the season ensure the spreadsheet [parkID_Collections_2011.xlsx](#) is transferred to W: drive in the park’s incoming folder within the regional folder.

Table 8. Specimen_Pt fields in the Alaska EPMT Data Dictionary.

Field Name	Type	Description
Collection_Date	Date	Date specimen collected. This field populates automatically.
Location_Name	Menu	The general area where the activity takes place with several possible in and around each park unit. The data dictionary has all LocationIDs already loaded and EPMT park staff should customize this field and arrange the locations in the order of most common usage. See Table 3 for a description of each LocationID. To visually see the delineation of each LocationID, pull up the "EPMT Location Index" theme in NPS Theme Manager and view it via ArcMap.
Collector_Name	Menu	The initials of the collector. Park staff should customize this field with the initials of the most likely EPMT or park staff.
Park_Unit	Menu	The four-letter code for the park unit. Park staff should customize the default for this field.
Site_Description	Text	This field provides the opportunity to explain the exact area within the LocationID as well as any information about that area that might be important. This should enable someone who looks at this data to understand where within the LocationID the specimen was collected without having to use GIS. Take the time while editing to be complete. Additionally, it 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.
Taxon	Menu	The scientific name of the species collected. All species that have been reported from Alaska NPS units are on this list. If the species collected does not appear on the list or the identity is uncertain, enter "Other" and note the species or uncertainty in the SuggestSpecName field. Park staff should customize this field and arrange the species in the order of most common occurrence for each park.
Suggest_Spp_Name	Text	Use this name to record what species was collected if the species name is not found in the Taxon drop down menu.
Habitat	Text	Field to make more specific habitat description
Soil_Txture	Menu	<ul style="list-style-type: none"> • Clay = smallest particle size (<3.9 µm – not gritty in mouth); a marble-sized hunk rolled between fingers <u>will</u> form a ball. • Silt = small particles (3.9-62.5 µm – will feel gritty in mouth); a marble-sized hunk rolled between fingers <u>may</u> form a ball. • Sand = larger particle size (0.0625 mm -2 mm); a marble-sized hunk rolled between fingers <u>will not</u> form a ball. • Loam = relatively even concentration of sand, silt, and clay; a marble-sized hunk rolled between fingers will seem to form a ball, but it will fall apart once pressure is released. • Gravel = largest particles (2-75 mm)
Soil_Moisture	Menu	dry, moist, wet, or other
Exposure	Menu	N, NE, E, SE, S, SW, W, NW
Slope_Site	Menu	flat, gentle, steep, other
Species_Abundance	Menu	rare, infrequent, common, abundant, other
Assoc_Spp	Text	Field to enter other nearby native and non-native species. Feel free to use the 6 digit species codes.
Comments	Text	Use this is a 100 digit field to convey anything extra that seems important about the specimen or collection area. Feel free to use shorthand as long as it intelligible after editing.
Photo?	Menu	Yes/No – All specimens SHOULD be photographed
Collnum*	Text	Collection number. Initials followed by number. e.g. WSR001
Photo_Filename*	Text	Filename of specimen photo
Determiner*	Text	Person who identified the specimen
Determiner_Date*	Date	Date determiner identified the specimen
NPS_Accession*	Text	NPS accession number
NPS_Catalog*	Text	NPS catalog number
Native*	Menu	Nativity of specimen – Yes, No, or Unk
Collection_Number*	Text	Identifying number of specimen (initials followed by number)

* These fields are likely best populated in the office through PFO.

Table 9. Collections spreadsheet fields.

Field Name	Description
Collnum	Initials followed by number. e.g. WSR001
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
Soil Texture	Soil texture. Clay = smallest particle size (<3.9 μm – not gritty in your mouth); a marble-sized hunk rolled between your fingers will form a ball. Silt = small particles (3.9-62.5 μm – will feel gritty in mouth); a marble-sized hunk rolled between your fingers may form a ball. Sand = larger particle size (0.0625 mm -2 mm); a marble-sized hunk rolled between your fingers will not form a ball. Loam = relatively even concentration of sand, silt, and clay; a marble-sized hunk rolled between your fingers will seem to form a ball, but it will fall apart once pressure is released. Gravel = largest particles (2-75 mm)
Soil Moisture	Soil moisture (wet, moist, dy, other)
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, make 3 separate rows, each with its 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.

Time Log

In an effort to better determine how EPMTs across the nation are performing, the national EPMT program tracks very specific information about the amount of time spent and people involved in every activity that the team performs, not only in the field but also in the office. This information is used to calculate more accurate costs per acre for various treatment activities and to provide overall transparency to NPS management and Congress.

In order for this to happen it is important that all Alaska EPMT staff keep specific, daily information on the amount of time spent on various work activities throughout the summer. A spreadsheet, [Park TimeLog 2011.xlsx](#), includes all of the required fields needed for this process.

All GPS and photo data must be edited and uploaded to the [Alaska EPMT regional folder](#) under a folder with your park code. Please upload all data produced in the preceding two weeks by the end of each pay period throughout the summer. This will ensure that the data is being processed correctly, in a timely fashion, and it can be processed and uploaded into the national and statewide databases so the information is available for use throughout the season. For the 2011 season the upload dates are:

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Some things to keep in mind to make the process easier:

- It is up to each park how to handle this log. Some parks use a single log for the entire season and every staff member has access to update it. Some parks assign each staff member a single log and each person is responsible for tracking their own time. These logs are then combined at the end of the season.



Use the method that works best for the park's situation but make sure this method is made crystal clear at the beginning of the season to all crew members so time is not double counted.

- Copy the spreadsheet [Park TimeLog 2011.xlsx](#) to the park's local EPMT file management folder and change "Park" to the park's four digit acronym.
- This log does not have to be detailed to the minute – 15 minute increments are enough.
- To facilitate completing this log it is helpful to carry a pocket notebook in the field and make daily notes on a calendar in the office.
- If the same location is being treated with several Alaska EPMT staff members, consider assigning the time tracking duties to a single individual. This will prevent duplicate entries in the log.

- If Alaska EPMT members will be stationed in the field for an extended period it might be helpful to print out a paper copy of the log to facilitate completion.
- The drop-down menus are customizable and the lists are found on the “Pull-down Menus” sheet. Delete the options that do not apply and update the initials field prior to data entry.
- To save time, once a local copy of the spreadsheet is created, pre-fill all the Park fields with the park’s code from the drop-down menu.

Time Log Process

The log is relatively straight forward. Table 10 describes the fields that should be filled out on the time log spreadsheet. An example of a completed time log for a full day can be seen in Table 12. The time log spreadsheet has been formulated and protected to try and prevent any confusion. Green fields are available for data entry. Blue fields will automatically be populated.



*Any fields which require entry will turn red once data entry begins. **Be sure that the log contains no red cells prior to the regional upload.***

If there are any questions on the process or issues with the spreadsheet, please contact the Alaska EPMT regional staff.

Table 10. Time Log spreadsheet – Field Descriptions.

Field Name	Description
Date of activity	The date the activity took place, in mm/dd/yyyy format
Time Start	Time the activity began. This must be entered in military time with no punctuation. Example: 1:00pm would be entered as 1300 or 1:15 would be entered as 1315.
Time End	Time the activity ended. This must be entered in military time with no punctuation. Example: 1:00pm would be entered as 1300 or 1:15 would be entered as 1315.
Park	The four digit park code where the activity took place.
Activity Category	The type of activity performed. Available choices are listed in Table 11.
Location	The location or LocationID where the activity took place. If the activity is Control Work, Data Collection, Restoration, Travel or Prep/Cleanup make sure this field accurately reflects the LocationID where the work occurred. See Table 3 for a detailed list of LocationIDs.
Activity Description	A brief description of what the activity entailed.
Recorder’s Initials	The three digit initials of the individual filling out the spreadsheet. This drop-down menu can be edited before the season begins to reflect only the individuals working in the park.
Associated Rover File	If the activity is associated with a GPS rover file (i.e. anything having to do with Control Work, Data Collection, or Restoration), record the associated file(s) name into the log.
# of EPMT staff	The number of individuals who participated in the activity whose salary is paid or partially paid with EPMT funding.
# of other NPS staff	Any other NPS staff member who participated in the activity who is not funded with EPMT funding.
# of SCA	Any member of the Student Conservation Association who participated in the activity.
# of SAGA	Any member of the Southeast Alaska Guidance Association who participated in the activity.
# of volunteers	Any volunteers associated with the activity. Use the Activity Description to include the names of the volunteers,
# of other people	Any other participants associated with the activity. For example, other federal or state employees.

Table 11. Time Log spreadsheet – Activity Categories.

Activity	Description
Administrative Tasks	Various office-oriented tasks – administrative paperwork, supply acquisition, etc.
Control Work	Field work directly treating invasive plants. This should be associated with a specific rover file and location ID.
Data Collection	Field GPS collection of invasive plant data. This would be selected if an area was inventoried but not treated. This should be associated with a specific rover file and location ID.
Data Management	Office work downloading and editing GPS or photo data.
Education & Outreach	Any sort of outreach activity – informational booths, presentation to park staff, etc.
Equipment Maint/Repair	Any equipment maintenance, including field tools or office equipment.
Meeting	Any sort of NPS meeting – staff meeting, Alaska EPMT conference call, etc.
Misc Park Activities	Any other activities performed by Alaska EPMT crew members for a park which are not related to invasive plants – assisting other programs, etc.
other	Anything not included in the Activity Category drop down list. Be sure to describe what the activity is in the Activity Description field.
Partnership Development	Any meeting including outside partners – CWMA or Watershed meeting, etc.
Personnel Management	Any hiring or supervisory activities.
Prep & Cleanup	The immediate preparation prior to or after a field project – organizing camping supplies, loading or unloading equipment, etc. This should be associated with the location ID where the project will or did take place.
Presentation Preparation	Any preparation for a PowerPoint/slideshow/oral presentation for a staff meeting, outreach opportunity, or conference.
Project Planning	Any planning of logistics or scheduling of a field project.
Report Writing	Any work on the End of the Season report or any other park report.
Restoration	Site restoration and revegetation work. This should be associated with a specific rover file and location ID.
Time Lost Due to Injury	Any time lost to an on-the-job injury – If John Doe twists his ankle while in the field working on an Alaska EPMT project and he has to spend an eight hour day to go to the doctor then eight hours would be time lost due to injury. This is always associated with a Worker's Compensation Case and CA-1.
Training	Any training activity – Alaska EPMT spring training, park safety training, etc.
Travel	The travel to or from a field project. This should be associated with the location ID where the project will or did take place.

Table 12. An example of a 1-day trip in GLBA with two EPMT staff, one other NPS employee, one SCA, two volunteers and a 8 person SAGA crew. The fields shaded blue are automatically calculated.

Day of Week	Date of activity	Time Start	Time End	Park	Activity	LocationID	Activity Description	Recorder's Initials	Assoc Rover File	# of EPMT staff	# of other NPS staff	# of SCA	# of SAGA	# of Vols	# of other	Total People	Hours	Total Person Hours
Mon	6/7/2011	0800	1000	GLBA	Prep & Cleanup	main_bay	Prepare for field work	BMM	none	2	1	1	0	0	0	4	2	8.00
Mon	6/7/2011	1000	1100	GLBA	Travel	main_bay	Skiff to Island	BMM	none	2	1	1	8	2	0	14	1	14.00
Mon	6/7/2011	1100	1530	GLBA	Control Work	main_bay	Manual control of SONARV	BMM	R060215a	2	1	1	8	2	0	14	4.5	63.00
Mon	6/7/2011	1530	1630	GLBA	Travel	main_bay	Return to BC	BMM	none	2	1	1	8	2	0	14	1	14.00
Mon	6/7/2011	1630	1700	GLBA	Prep & Cleanup	main_bay	Clean up from field	BMM	none	2	0	1	0	0	0	3	0.5	1.50

Phenology Log

Given the nature and set up of the Alaska EPMT, there is often some turnover of staff from year to year at each park. In an attempt to smooth this transition and to try and prevent any loss of on-the-ground knowledge, park EPMT staff should record the major phenology stages of invasive species throughout the season. This will allow future park EPMT staff to have a better handle on when is the best time to treat certain species and areas.

To help facilitate this park EPMT staff should use the [parkcode Phenology 2011.xlsx](#) spreadsheet to record this information. The master spreadsheet includes all the species which are found in Alaska. Parks should feel free to edit this spreadsheet to include only the species which are found in your area.

This spreadsheet should be saved in the local park file management structure so it can be accessed easily throughout the season. It may be easiest to print out the sheet on weather resistant paper, routinely write down the dates throughout the summer, and enter the information into the spreadsheet at the end of the summer. Printing this spreadsheet and carrying it into the field provides two benefits:

1. Having the sheet on hand while conducting invasive surveys will increase the likelihood of it actually being filled out.
2. The sheet will serve as a species reference list since it includes both the scientific and common names of the species found in the park.

It is possible that different locations in parks have ecological and meteorological factors that lead to different phenology timing. Consult with previous season's phenology logs and park staff to determine where these areas are and record the phenology information for these areas on separate sheets.

Table 13. Example of the Phenology Log.

Year 2011	Park	Sublocation	
Taxon	Common Name	Date of First Flower	Date of Seed Set
<i>Achillea ptarmica</i>	sneezeweed		
<i>Aegopodium podagraria</i>	bishop's goutweed		
<i>Aegopodium podagraria</i>	bishop's goutweed		
<i>Agrostis gigantea</i>	red top		
<i>Alchemilla mollis</i>	ladies mantle		
<i>Allium schoenoprasum</i>	wild chive		
<i>Alopecurus geniculatus</i>	marsh meadow-foxtail		
<i>Alopecurus pratensis</i>	meadow foxtail		

Annual Summary Report

The annual summary report for a park is the chance to summarize what has been learned and accomplished with regard to invasive plant management over the course of the season and make suggestions for future years. These are immensely valuable for record-keeping and future planning, and it will also demonstrate to your supervisor and other park staff the quality of the work performed. Be as thorough as possible with this.



Feel free to use previous reports as a starting place but do not copy sections verbatim.

Report Format

All Alaska EPMT summary reports will be submitted to the National Resource Publication Management division under the National Resource Data Series for publication on their website <http://www.nature.nps.gov/publications/NRPM/index.cfm>. This allows the Alaska reports to go through a standardized peer review process and be accessed and cited on a national level.

A blank report template and a walkthrough document on the report formatting is saved at W:\ARO\NaturalResources\EPMT\2011_DATA\2011_OUTGOING\Report

Examples of 2010 reports can be found on the [Alaska EPMT website](#).

The [Editorial Style Guide for Park Science and Natural Resources Year in Review](#) is another reference for writing NPS reports.

What Should the Report Include

The layout of these summary reports is pretty standard and is designed to answer the 5 Ws – who, what, when, where, why, and how.

Abbreviations

A list of all abbreviations used in the report. While not required it is a reader friendly item that is especially helpful.

Abstract/Executive Summary

A succinct summary of the season that could include total number of species inside/outside of park, areas surveyed, new species found, species eradicated, acres inventoried/infested/treated, etc. This should only be one paragraph in length.

Acknowledgments

This is also not required but a nice way to thank any local organizations or park employees that were helpful during your season. This should only be one paragraph in length.

Introduction

There is no need to provide a lengthy overview of why invasive plants are a problem for Alaska. Instead, give a little background on the park unit (location, size, issues) and a history of invasive plant surveys and management efforts - the context of the work in 2011. This section should answer the who and what.

Methods

This section should explain how the park’s priorities were determined, why areas were selected for survey, what areas were surveyed, how thoroughly/frequently they were surveyed, and what control methods and personnel were utilized. List the equipment and treatment methods used. There is no need to go into detail about the Alaska EPMT data collection protocol in this section. A simple citation of this protocol will suffice. This section should answer the how.

Results/Accomplishments

This section should be the main focus of each report. Let the reader know what actions were taken to control the infestations found, so that the data does not have to speak for itself. Include:

Overview

Summarize your acreage accomplishment for the season. Most parks include a table here that compares the current year’s results to previous years. Also include any key developments – eradications, new species etc.

Inventory and Control Accomplishments

Highlight any new species or situations of particular concern. If there are any eradicated infestations, species colonizing natural areas, or any other unusual or noteworthy event, be sure to include it in this section. Most parks have this section organized by location – relating all the invasive plant inventory and control work that occurred in a specific area over the course of the entire season. Summarize 2011 invasive plant distribution (diversity and relative species abundance in front country and backcountry) in comparison to what has been documented in previous year’s reports and data. If this is what you choose to do it is a good idea to include an appendix or table that covers species specific occurrences within the park. The season’s completed time log is a useful tool to highlight projects and activities. Include the specific dates of the actions.

Graphs are a great way to try and communicate the results of multiple year efforts of specific infestations (Figure 10).

Park Species

Include a table that lists all the invasive species documented in and around the park. This should include all species that have ever been documented not just the ones from the 2011 season. The easiest way to construct this table is to use the Master Invasive spreadsheet and add any additional species documented during the 2011 season. If there are species on the master list that should not be there, let the Alaska EPMT regional staff know. Include in this table if the species was documented in 2011 and in what parts of the park it was seen (e.g. Park Headquarters, Park Road, Backcountry, Outside Park). If the species has been eradicated, include it in the list but indicate that when it was last observed.

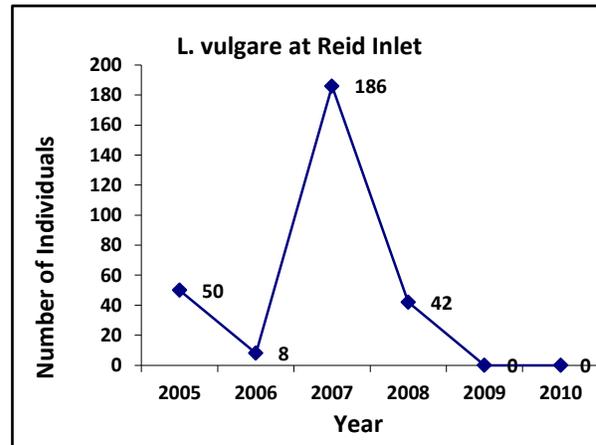


Figure 10. The number of oxeye daisy individuals observed and removed at Reid Inlet since 2005.

Education and Outreach

Include any and all education efforts that took place during the 2011 season.

Recommendations/Discussion

Make recommendations for next year to improve how things can be done at the park or region level. Be thorough with everything that could be done, even if it seems unlikely to happen. Also include anything else that might be important – every insight on any perceptions, concerns, ideas, or problems is helpful.

Literature Cited

This section includes a list of all literature cited in the report. Be sure to include an access date for any internet citations.

Formatting Standards

Use the standards described in the [National Resource Data Series template](#). These standards cover font use and layout. The following sections spell out formatting specific to the Alaska EPMT reports,

Scientific Name Use

A species scientific name should be included in parenthesis after the first use in the document of the common name. After that point only the common name should be used. Use the common and scientific names that appear in the Master Invasive spreadsheet so that they are consistent throughout the park report and the region.

Common names should not be capitalized unless they have a proper name (e.g. European mountain-ash or common dandelion). Scientific names should have the genus capitalized and be italicized with the exception of abbreviations used (e.g. *Taraxacum officinale* ssp. *officinale* or *Melilotus* spp.).

Figures and Maps

Pictures are a great way to show the work that has been accomplished at each park. Be sure to include various photos to help demonstrate all of the on-the-ground work the EPMT has completed in 2011.

Maps are optional but helpful in illustrating priority areas. If assistance with GIS data is needed to complete maps, please contact the Alaska EPMT regional staff no later than August 12 so the data can be properly processed.

Review Process

After the report has been written and you have completed your initial review, determine who at the park level should review the document. Some suggestions include anyone who actively participated in the EPMT program: a park ecologist or botanist, any supervisors, etc.



At least one other person besides you should have edited the report before submittal to the Alaska EPMT regional staff.

Again, at this stage do not stress out too much on the formatting of your report – focus on the content. Make sure the writing flows and that everything makes sense. Remember that people who are not familiar with the area will be reading this.

In addition to submitting the actual report, each park should submit a copy of the [Manuscript Submittal Form](#) with Section 1 filled out. The Alaska EPMT regional staff will fill in the rest of the form and submit it once the report is finalized.



Draft reports should be sent to Alaska EPMT regional staff for review at least two weeks prior to the seasonal staff's end date or September 2nd, whichever is earlier.
This will allow for adequate time to address any remaining edits or comments.

The report should be submitted to the regional office in MS Word format. Acrobat PDF versions will be made by the Alaska EPMT regional staff once the Peer Review and formatting process is complete.