

**Validation of Historic Fire Occurrence
Locations for Fire Program Analysis,
Preparedness Module (FPA-PM)**

NPS FPA Data Assembly Team, 2004

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Objective

This document provides background information, general procedures, operational notes and standard operating procedures for historic fire occurrence data validation. Much of this documentation is based upon data development work in 2003 and 2004 by the National Park Service FPA Data Assembly Team, a workgroup led by Doug Stephen. Kathie Hansen, NPS Midwest Region Fire GIS Specialist is the project lead for fire occurrence data cleanup. The purpose of this document is to provide guidance for validating and/or updating the location data from DI-1202 fire occurrence records in the SACS (Shared Applications Computing System) database in Boise. The objective of this document is to complement a working knowledge of GIS data processing with a set of steps to validate and, when necessary, correct the recorded location of fires.

The Fire Program Analysis (FPA) budget system will likely use 10-20 years of historical fire occurrence data in modeling fire for budget purposes. This should be considered the minimum standard for data validation and cleanup. Ideally, all records for each park unit should be validated and cleaned.

Background

The National Park Service has been recording data on the occurrence of fire on NPS lands, and fires suppressed by NPS employees, since the early part of the 20th century. In the Department of the Interior, the DI-1202 form has been the standard fire report since the late 20th century. The form has changed somewhat over the years to increase the quality of data captured. The most current revision was made in 2004. A memo was distributed at that time to explain the change. Appendix item A is the 2004 DI-1202, *DI-1202rev04.xls*, and the Appendix item B is the Memo, *2004_1202inst.doc*. One component of the fire record that received little attention until the Fire Program adopted GIS is the actual location of the fire. When fire locations were mapped by Fire Program GIS specialists in 2000 and 2001, a very high level of error in the location of fires was evident. This was confirmed and publicized in a Desert Research Institute (DRI) publication in December, 2002.¹ DRI found that about 10% of Forest Service fire locations, and about 30% of Department of the Interior fire locations were unusable.

A number of initiatives have tried to clean up known problems in fire occurrence records. For example, a DOI memo from 2001 indicates a move towards fully automating fire records² to eliminate differences between land management unit and national office data sets. In 2003, Doug Stephen, Fire GIS Specialist for the NPS Intermountain Region, proposed to the NPS Fire Program leadership that an initiative take on the problem of cleaning up location errors in NPS fire occurrence records. This coincided with the early stages of the Fire Program Analysis (FPA) development project which will use the record

¹ <http://www.cefa.dri.edu/Publications/fireoccurrencereport.pdf>

² [https://doi1.ios.doi.gov/cdirectives.nsf/0/b7c7f203838e043288256a5e0083becf/\\$FILE/CAIM2001-044.pdf](https://doi1.ios.doi.gov/cdirectives.nsf/0/b7c7f203838e043288256a5e0083becf/$FILE/CAIM2001-044.pdf)

of historical fire locations to model fire occurrence for the purposes of evaluating the effects of fire budgets on resources available for fire management.

Procedural Notes

In the National Park Service (NPS) the DI-1202 form (known in the Service as a “1202”) is filled out for each fire that occurs. This form includes data such as, fire name, start date, end date, cause of fire, fire size and location. In its present version, the location may be recorded in Latitude/Longitude (Lat/Long) and/or Universal Transverse Mercator (UTM) coordinates. In records collected before 2003, it was possible for locations to be entered as Public Lands Survey System (PLSS), using the Township/Range/Section location referencing system. DI-1202 records are entered into the SACS fire occurrence database, on the Shared Applications Computing System (SACS), in Boise.

Some of the difficulties related to spatially representing SACS fire occurrence output in a GIS are:

- Location data need to be converted from text format to a GIS compatible format
- Location referencing coordinates need to be standardized to a single coordinate system. Where data is Township/Range/Section, there is the question of where within the Section the fire actually occurred
- For “threat” fires, recorded as Mutual Aid responses (1202 Fire Type 15 and 16), location coordinates are not required in the SACS data entry process so many are blank.
- Some of the fire occurrence ignition points may not belong in the fire history map, including support actions (Type 37), and false alarms (Type 51, 55 and 56).

Historic fire occurrence (DI-1202/SACS) data are validated and updated through a three-phase process. First, data are downloaded from the SACS system and are imported into an Excel spreadsheet where they are formatted to be compatible with a GIS. Second, the data are converted into an event theme in ArcView, evaluated and edited. Third, the data are exported to a .dbf file and are uploaded back into the SACS system. Note: If non-locational errors (e.g. incorrect fire type) are found during the location validation process, a list of SACS corrections is prepared for the park. Non-locational edits need FMO approval and we recommend those be made at the park level.

Operational Notes

- Unless otherwise recorded, locations reported as latitude and longitude or township/range/section, in the SACS database that were entered prior to 1983 should be considered to be in North American Datum 1927 (NAD 27). The official map datum of the federal government is North American Datum 1983 (NAD83) but many NPS units use NAD27. If datum is not recorded for reports after 1983, NAD27 should be used.
- SACS output of UTM coordinates appear to be in North American Datum 1983 (NAD83) when plotted in a GIS. If the SACS UTM coordinates are used in the validation process, it may be essential to refer back to DI-1202 forms to verify datum or assume park GIS datum at that time.

- Theoretically, when plotting a fire occurrence point with reported UTM coordinates and again with reported Lat/Long coordinates, the two points should be in the same location when displayed with the same map projection in a GIS. When the points aren't in the same location, there is a datum difference between the two sets of reported coordinates. Unless the DATUM field in SACS has a valid value, it is best to plot data in both decimal degrees and UTM coordinates to establish the actual map datum in use and use the coordinates you feel best represent the true ignition point.
- In some cases, data will be available in Latitude/Longitude, UTM, or both. In other cases, it is possible that the only location reference is in the Public Lands Survey System (PLSS). For these data, it will be necessary to use software or a web utility to convert PLSS references to a GIS-compatible coordinate system. One such utility is: <http://www.esg.montana.edu/gl/trs-data.html>. Once PLSS data have been converted into decimal degrees, it will be possible to create an event theme in ArcView to check the positional validity of records. Latitude and longitude derived from PLSS data are only accurate to the center of a section at best which roughly correlates to a horizontal accuracy of +/- 2600 feet. The Target data accuracy standard for fire ignition locations is +/- 600 feet.
- Information on the DI-1202 recordkeeping system can be found on the NPS Intranet: <http://inside.nps.gov/documents/DI-1202%20Instructions.pdf> Fire types are defined on pages 8 to 11. Screenshots of the screens encountered in data entry, showing the options for entering coordinates, are in http://inside.nps.gov/documents/2004_1202inst.doc.
- At the present time (June, 2004), SACS subject matter expert (SME) Dale Miracle has requested that all possible changes be made at the local (park) level. When non-local staff are involved in correcting fire locations, Dale prefers to have local staff involved in making decisions on how changes will be made. Local staff are responsible for making all changes to fire records except location corrections.

Methods for Validation

A. GATHERING DATA

There are three sources of information that will assist in validating fire ignition points for a park: 1. SACS GIS, 2. Hardcopy 1202 Reports, and 3. PARK GIS.

1. SACS GIS: To obtain data from the Shared Application Computer System (SACS) go to ftp://ftp.den.nps.gov/incoming/FIRE/FPA_SACS_allNPS/ or contact NPS Fire Program Data Manager at NIFC. The SACS data will come with three files (.dat, .lay, and .nar), that can be converted into a GIS. For details on how to convert the SACS data into a GIS, see Spreadsheet Creation below.

2. Hardcopy 1202 Reports: Originals or photocopies of the DI-1202, Individual Fire Report, should be obtained from the park. It is important to keep in mind that the fire reports are not always available for all fires, because some reports may be lost or missing.

3. PARK GIS: Some parks will have already begun to validate the locations of fire ignition points. Many times this data is available in GIS format and can be used in conjunction with the SACS GIS data to validate ignition points. Details on how to incorporate an Existing PARK GIS into the validation process are described in sections C.1. and C.2 below.

B. ORGANIZING DATA

The SACS Fire Occurrence data (1202 data) for the park was downloaded from national data set. Only the following fields were downloaded: Unit ID, Year, Fire Number, Fire Type, General Cause, Specific Cause, Fire Name, Area Name, Latitude, Longitude, Owner, Township, Range, Section, Meridian, UTM Zone, UTM Easting, UTM Northing, Discovery Date, Controlled Acres (reported acres * 10), Date Declared Out. It is important to remember that each park has three associated files for fire occurrence: *.dat, *.nat, *.lay.

Spreadsheet Creation:

- The Excel template spreadsheet is Appendix item C., *PARK_1202_standard_fields_08172004_krh.xls*
- Open the Excel template spreadsheet *PARK_1202_standard_fields_08172004_krh.xls* and save to a new name, replacing PARK with the 4 letter park code (*PARK_1202_standard_fields_mmddyyyy_xxx.xls*).
- There are 3 worksheets within the Excel workbook file:
 - *PARK_1202_StandardValidFields* = imported .dat data with column headers
 - *PARK_1202_CulledType37&5xFires* = type 37 and 5*Fires deleted
 - *PARK_1202_Validation_FPA* = validation columns added (cell fill gray).
- Change the part of the name in the worksheet tabs from PARK to the 4 letter park code. (optional)
- The following fields were added to the spreadsheet: NPS_ID (concatenation of Unit ID, Year and Fire Number to create unique primary key field) [fx =CONCATENATE(B2,C2,TEXT(D2,"000#"))], CNTRL_ACRE (SACS data divided by 10) [fx =U2/10], PLOT_LAT_DD (degrees, minutes, seconds converted to decimal degrees) [fx =INT(J2/10000)+(INT((MOD(J2,10000))/100)/60)+(MOD(J2,100)/3600)], PLOT_LONG_DD (degrees, minutes, seconds converted to negative decimal degrees) [fx =(-1)*(INT(K2/10000)+(INT((MOD(K2,10000))/100)/60)+(MOD(K2,100)/3600))], PLOT_EASTING (two decimal places added to coordinate), PLOT_NORTHING (two decimal places added to coordinate) [fx =S2*0.01], VALIDATED (Y or N), COORDINATES ADDED OR CHANGED (Y or N), 1202? (reviewed? Y or N), POLYGON (created? Y or N), METHOD (polygon creation method), COMMENTS (general comments).

- With PARK_1202_standard_fields_mmddyyyy_xxx.xls open, Open SACS .dat file (*.dat) in Excel as a comma separated file.
- Select cells A1 through U* and copy
- Open (switch window) PARK_1202_standard_fields_mmddyyyy_xxx.xls
- Click on cell B2 in PARK_1202_StandardValidFields worksheet and Paste
- Click on cell B2 in PARK_1202_CulledType37&5xFires worksheet and Paste
- Click in cell E2 and sort data by fire type
- Select all Rows for type 37 fires and delete Edit | Delete
- Select all Rows for type 50-59 fires and delete Edit | Delete
- Select B2 – V* in worksheet PARK_CulledType37&5xFires worksheet and Copy
- Click on cell B2 in PARK_1202_Validation_FPA worksheet and Paste
- Scroll through entire worksheet to make sure columns containing formulas are filled for all records
- File | Save
- Spreadsheet is ready for validation
- With PARK_1202_Validation_FPA worksheet open, save as a comma separated file. File | Save As | CSV (Comma delimited) (*.csv)
- Say OK and Yes to the next two questions.
- Close Excel and say No when you are asked if you would like to save.
- Open Windows Explorer, browse to PARK_1202_standard_fields_mmddyyyy_xxx.csv and rename to PARK_SACS.txt file
- Say Yes to question about changing file extension.
- Open an ArcView project (*.apr)
- Set Map Units to Meters in View Properties
- Add Table to the Project by selecting PARK_SACS.txt
- It is assumed that **UTM easting and northing coordinates in the SACS 1202 records are in NAD83.**
- Add event theme to View with UTM coordinates plotted for X (**Plot_easting**) and Y (**Plot_northing**).
- Convert event theme to shapefile and overlay on park boundary (note park boundary needs to be NAD83).
- It is assumed that **Latitude Longitude coordinates in the SACS 1202 records are in NAD27.**
- Open a second View and add event theme with decimal degree longitude and latitude plotted for X (**Plot_long_dd**) and Y (**Plot_lat_dd**).
- Convert event theme to shapefile.
- Project Geographic (Decimal Degree) shapefile from Geographic NAD27 to UTM NAD83 so it can be added to the second View with base data for validation of point locations.
- Fire Occurrence points plotted from UTM reported coordinates and points plotted from Lat/Long coordinates should theoretically be in the same locations BUT often one looks “better” than the other. Choose one of the two shapefiles as your editing layer and use the other for reference only.

- Bring PLSS (Public Land Survey System) and DRG (scanned 1:24 K topos) into View 1 to aide in validation if available.

C. VALIDATION

This how-to checklist is intended to assist in validating fire ignition points for the National Park Service. Please note that there are two checklists: validation *without* a PARK GIS (no exiting spatial data), and validation *with* a PARK GIS (spatial data is available). **Refer to the flowcharts in the appendix when following these procedures. Appendix item D is for Validation without a Park GIS, *SOP_flowchart_WOParkGIS.pdf* and Appendix item E is for Validation with a Park GIS, *SOP_flowchart_ParkGIS.pdf*.**

1. Validation *without* a PARK GIS

a. Important Notes:

- Validate each fire location (for last 20 years or all years) by using 1202 hard copy forms, hard copy fire atlas, PLSS theme, DRG, Park Fire Atlas points and/or polygons, burn plans, and other spatial data or additional resources.
- Good tools on the internet to convert legal descriptions or other reported coordinates on the 1202s are: <http://www.esg.montana.edu/gl/trs-data.html> and <http://www.topozone.com/> and <http://jeeep.com/details/coord/>.
- Look for “obvious” errors in the attribute table. It is sometimes “obvious” that coordinates are incorrect because of a missing digit (e.g. “-22” is entered in the longitude column rather than “-122”, placing the fire in the Atlantic Ocean rather than in the US West). Occasionally coordinates (UTM or Lat/Long) can be seen to have been reversed. If no spatial information is entered in SACS resulting in -0- lat and -0- long, the point will not plot spatially.
- Move ignition points as necessary. **If points need to be added or deleted, have park staff do this in SACS line by line.** For additions, check coordinates for park staff to ensure they are correct on the 1202. If they are incorrect or lacking on the 1202, add the correct coordinates. Write out coordinate type (e.g. Latitude/Longitude Degrees, Minutes & Seconds) and datum. Initial and date.
- OPTIONAL: Validate and/or create polygon themes of fire perimeters if time allows (will be used for Phase II of FPA). Create polygon fire perimeters from existing spatial files, GPS data, or by digitizing from hard copy resources. When lacking existing spatial data or hard copy maps, buffer fire occurrence point to reported acreage from 1202 record to give a spatial representation of burned area. See Appendix item F, *Proposed_NPS_Fire_history_standard_4-03-03.doc* and Appendix item G, *Guidelines for building Fire History spatial data layers.pdf* before beginning polygon data creation.

b. How to Validate Fire Ignition Points *Without* a PARK GIS:

1. If a 1202 is available:

The first page of the form contains details on the specifics of the fire. And the second or back page contains a fire narrative, and a map that are very helpful in locating the fire.

2. If there is a map with the 1202:

3. Compare the ignition point or center of a fire polygon on the 1202 map with the GIS plot of the SACS ignition point. Many times these points are not in the same location. 4. Assume that the 1202 map location is correct, and move the GIS point to the location shown on the 1202 map if necessary.

5. It is also good to check if a Township, Range, and Section (TRS³) location is available, and compare it to the 1202 map. 6. You may need to move the point if there is a discrepancy.

7. Once you have the fire properly located in the GIS, it is a good idea to check the fire type. Reading the notes on the second page of the 1202 will help to determine if the fire type is correct. Appendix item H. is a complete listing of DI-1202 fire types, *doi 1202 fire types codes.doc*. It is important to pay attention to the location of the fire when checking the fire type. For example: a fire occurs 40 miles outside the park but is labeled a type 16 fire. It is likely that this should be a type 37 fire instead of a type 16. Use the Fire Type by Location Guide in Section 3 to help determine if the fire type is correct.

8. If necessary, change the fire type in the GIS, and **make a note for the park to edit the fire type in SACS** as well.

9. If there is no map with the 1202:

10. Check for a TRS location on the 1202 or in the GIS attribute table. The TRS may only give a general location (center of section), but you can use this to locate the fire when no map is available.

11. You can also check the .nar file that comes with the SACS download for a written description of the fire location.

12. In addition to the TRS and .nar, you can check the fire name for clues on the location of the fire (e.g. a fire named Mt. Baker likely took place on or nearby Mt. Baker).

13. Compare these three pieces of information to the GIS plot to decide on the best location. 14. Move the fire point if necessary. Continue with steps 7-8 above.

15. If there is no 1202:

16. Check for a TRS location in the GIS plot of SACS attribute table. The TRS may only give a general location (center of section), but you can use this to locate the fire when no 1202 is available.

17. You can also check the .nar file that comes with the SACS download for a written description of the fire location.

18. In addition to the TRS and .nar, you can check the fire name for clues on the location of the fire (e.g. a fire named Mt. Baker likely took place on or nearby Mt. Baker).

19. Compare these three pieces of information to the GIS plot to decide on the best location. 20. Move the fire point if necessary.

³ <http://www.esg.montata.edu/gl/trs-data.html>

21. Once you have the fire properly located in the GIS, it is a good idea to check the fire type. You can check the fire type with the locational notes in the .nar file. Appendix item H. is a complete listing of DI-1202 fire types, *doi 1202 fire types codes.doc*. It is important to pay attention to the location of the fire when checking the fire type. For example: a fire occurs 40 miles outside the park but is labeled a type 16 fire. It is likely that this should be a type 37 fire instead of a type 16. Use the Fire Type by Location Guide in Section 3 to help determine if the fire type is correct.
22. If necessary, change the fire type in the GIS, and **make a note for the park to edit the fire type in SACS** as well.

2. Validation *with* a PARK GIS

a. Preprocessing and Important Notes:

The following processing steps can be performed to derive FPA-compatible data from a PARK GIS:

1. The park's point theme needs to be in the same projection and datum as the SACS plotted data (UTM Zone__, NAD83 as mentioned above). Do not edit the original park data layer, save to a new shapefile before editing.
2. Add to the UTM View 1 that contains the plotted SACS reported coordinates output and park base data.
3. Add primary key data field to park point theme:
 - a. Name it NPS_ID – concatenation of regional identification, park id, year, and fire number
 - b. If park point theme does not have the attributes needed for concatenation, use other attributes provided such as fire name and date to populate new fields needed for NPS_ID.
4. Link the attribute table for park point theme to plotted SACS shapefile with NPS_ID field so you can query the tables for discrepancies.
5. You should **edit the park point theme** to reflect the correct locations for the fires. You should use a tool like X-tools or AlaskaPak to “Add XY” to ensure correct easting and nothing are recorded in the attribute table after validation is complete.
6. You should make note of any fires present in park point theme and absent in plotted SACS shapefile and vice versa. New points can be added to park point theme based on SACS output. You may find that new SACS entries may need to be made based on existence of spatial reference and hard copy 1202 fire report. **NOTE:** We can only add fire records to our spatial data if a SACS entry exists in the national fire occurrence database. New fire locations (not in SACS download) based on spatial data and hard copy 1202s should NOT go into the spatial coordinates that will be uploaded back into SACS at the end of validation. **New SACS entries must be made at the local (park) level with FMO approval**, by logging into SACS and entering the new record as you would all other fire records from hard copy 1202s.
7. As coordinates are validated, added, moved, etc., please populate existing fields (validate, comments, etc.) for those records or create new fields to track edits.

b. How to Validate Fire Ignition Points *With* a PARK GIS:

1. If a 1202 is available:

The first page of the form contains details on the specifics of the fire. And the second or back page contains a fire narrative, and a map that are very helpful in locating the fire.

2. If there is a map with the 1202:

3. Compare the ignition point or center of a fire polygon on the 1202 map with the PARK GIS ignition point. 4. Also compare the ignition point or center of a fire polygon on the 1202 map with the GIS plot of the SACS ignition point. Many times these points are not in the same location. 5. Assume that the 1202 map location is correct, and move the PARK GIS point to the location shown on the 1202 map if necessary (unless you have reason to believe the GIS over the 1202 map).

6. It is also good to check if a Township, Range, and Section (TRS) location is on the 1202 or in the GIS plot of SACS attribute table available, and compare it to the 1202 map. 7. You may need to move the point if there is a discrepancy.

8. Once you have the fire properly located in the PARK GIS, it is a good idea to check the fire type. Reading the notes on the second page of the 1202 will help to determine if the fire type is correct. Appendix item H. is a complete listing of DI-1202 fire types, *doi 1202 fire types codes.doc*. It is important to pay attention to the location of the fire when checking the fire type. For example: a fire occurs 40 miles outside the park but is labeled a type 16 fire. It is likely that this should be a type 37 fire instead of a type 16. Use the Fire Type by Location Guide in Section 3 to help determine if the fire type is correct.

9. If necessary, change the fire type in the PARK GIS, and **make a note for the park to edit the fire type in SACS** as well.

10. If there is no map with the 1202:

11. Check for a TRS location on the 1202 or in the GIS plot of SACS attribute table. The TRS may only give a general location (center of section), but you can use this to locate the fire when no map is available.

12. You can also check the .nar file that comes with the SACS download for a written description of the fire location.

13. In addition to the TRS and .nar, you can check the fire name for clues on the location of the fire (e.g. a fire named Mt. Baker likely took place on or nearby Mt. Baker).

14 and 15. Compare these three pieces of information to both the PARK GIS plot and the SACS GIS plot to decide on the best location. 16. Move the fire point if necessary. Continue with steps 8-9 above.

17. If there is no 1202:

18. Check for a TRS location in the GIS attribute table. The TRS may only give a general location (center of section), but you can use this to locate the fire when no 1202 is available.

19. You can also check the .nar file that comes with the SACS download for a written description of the fire location.

20. In addition to the TRS and .nar, you can check the fire name for clues on the location of the fire (e.g. a fire named Mt. Baker likely took place on or nearby Mt. Baker).

21 and 22. Compare these three pieces of information to both the PARK GIS plot and the SACS GIS plot to decide on the best location. 23. Move the fire point if necessary.

24. Once you have the fire properly located in the GIS, it is a good idea to check the fire type. You can check the fire type with the locational notes in the .nar file. Appendix item H. is a complete listing of DI-1202 fire types, *doi 1202 fire types codes.doc*. It is important to pay attention to the location of the fire when checking the fire type. For example: a fire occurs 40 miles outside the park but is labeled a type 16 fire. It is likely that this should be a type 37 fire instead of a type 16. Use the Fire Type by Location Guide in Section 3 to help determine if the fire type is correct.

25. If necessary, change the fire type in the GIS, and **make a note for the park to edit the fire type in SACS** as well.

3. Fire Type By Location Guide

This guide is intended to explain where fire ignition points should be located based on fire type.

Type 11/12/13/14

- Always within the park boundaries
- May have an ignition point just outside the park boundary when the fire spread quickly and significantly into the park

Type 15/16

- Always outside the park boundaries, and nearby the park (adjacent or adjoining land)

Type 21

- Always within the park boundaries

Type 37

- Always outside the park boundaries, and far from the park (not local)
- Do not include in GIS

Type 48/49

- Always within the park boundaries

Type 51

- Always within the park boundaries
- Do not include in GIS

Type 55/56

- Always outside the park boundaries, but nearby the park (adjacent or adjoining land)
- Do not include in GIS

D. FINALIZING DATA

1. Preparing Data for Upload to National SACS Database:

Option 1:

- Correct locations for all fires (not including mutual-aid or false alarm) with errors in Excel spreadsheet (PARK_1202_standard_fields_mmddyyyy_xxx.xls). Enter correct X-easting and Y-northing that were generated from the GIS into the **Plot_Easting** and **Plot_Northing** columns (the new grey fields that are added to the last sheet, PARK_1202_Validation_FPA) in the spreadsheet. Delete all other populated locations fields (especially Township, Range, Section) that may cause confusion as to which is the correct data. Latitude and Longitude will be calculated from the UTM coordinates before SACS updates are made.
- Populate other added fields to track validation status and method and add comments as necessary.
- Once all corrections are made in the spreadsheet for the UTM coordinates, add the comma separated text file to a View in ArcView as an event theme (see method mentioned earlier) to verify again that UTM corrections were good.
- Send Excel spreadsheet to Kathie Hansen, NPS FPA Data Assembly Project for coordinate upload to national SACS database. Kathie_hansen@nps.gov

Option 2:

- Make sure to use AlaskaPak (or similar extension) to “Add XY” to attribute table for corrected UTM plotted fire occurrence points in the shapefile (either the park shapefile or the shapefile created from the plotted SACS data – whichever is the one that was edited during validation/correction).
- Add a new worksheet to PARK_1202_standard_fields_mmddyyyy_xxx.xls spreadsheet
- Open .dbf of corrected/validated shapefile in Excel. Select all records and copy/past to new worksheet in PARK_1202_standard_fields_mmddyyyy_xxx.xls
- Delete all columns except the following: UNIT_ID, YEAR, FIRE_NUM, FIRE_NAME, X (EASTING), Y (NORTHING).
- Add two fields, UTM_ZONE and DATUM and populate accordingly.
- Two additional fields should be calculated when possible to expedite the upload preparation to SACS: LONG_DD, LAT_DD. These decimal degree values can be calculated before exporting the .dbf from the shapefile or by another preferred method. If the fields are not present and populated in the final spreadsheet, they will be calculated by Kathie Hansen.
- Rename new worksheet so it is clear the coordinates are the validated ones that should be used for SACS upload.
- Send Excel spreadsheet and entire shapefile (optional) to Kathie Hansen, NPS FPA Data Assembly Project for coordinate upload to national SACS database. Kathie_hansen@nps.gov

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2. How Data Are Uploaded to SACS

In consultation with the SACS programmer, Doug Gailey, a procedure has been developed to reduce the likelihood of introducing error through the data upload process. A new Excel spreadsheet is created by Ed Delaney, Data Manager, NPS-NIFC, from the valid fire occurrence data, and named “PARK_upload_data_year1-year2_nad83_ABC,” where “year1” and “year2” are the start and end years for the data in the worksheet, the datum is indicated, and ABC is the initials of the individual creating the data file.

- The Excel workbook is saved onto a CD for record keeping and archiving.
- The NPS-NIFC data manager will deliver it to the SACS programmer.
- After the data have been delivered to the SACS programmer the data will be uploaded on the “test-side” of SACS

Only latitude/longitude coordinates in decimal degrees will be uploaded. UTM coordinates will be used for QA/QC purposes. See example below:

FIRE_NAME	YEAR	UNIT_ID	FIRE_NUM	UTM_EAST	UTM_NORTH	UTM_ZONE	DATUM	LONG_DD	LAT_DD
BOX_2	1993	IMROSAGU	4	529372.3276580	3558329.1246201	12	NAD83	-110.6884897	32.1610457
DEER_CAMP	1993	IMROSAGU	3	532034.1402494	3558385.5946921	12	NAD83	-110.6602582	32.1614825
MICA	1993	IMROSAGU	7	543313.5748653	3565910.7230309	12	NAD83	-110.5402945	32.2289908
BOUNDARY	1993	IMROSAGU	14	530817.9252785	3566448.6554450	12	NAD83	-110.6728966	32.2342564
RINCON	1993	IMROSAGU	15	542414.7021647	3557423.4756353	12	NAD83	-110.5502111	32.1524594

a. Importing corrected 1202 location data into SACS:

The following steps are performed by the SACS programmers (Tom Kearney, Dennis Petersen as of 10/1/04):

- Using Excel, the corrected location file is opened, and saved as a ‘comma-separated values (.CSV)’ file.
- This .CSV file is then transferred to the SACS system using FTP.
- The import program is checked to be sure it corresponds to the input data, column for column, taking special attention to the latitude and longitude format.
- The import program is then executed using the import .CSV file.
 - The fire is validated using the unit name, fire calendar year, and the fire number. Is no such fire is located in SACS, an exception report is generated.
 - The latitude and longitude are extracted and converted to a format suitable for storage within SACS. Also, a conversion report is generated, listing the extracted latitude and longitude with the converted-to UTM coordinates.
- The conversion report is sent back to Ed Delaney, Data Manager.
- During a ‘test’ run, no files are altered. The input .CSV file is read and examined for errors.

- During a ‘production’ run, the valid corrected latitude and longitude would be entered into the production data files on SACS, with their equivalent UTM coordinates.

b. Quality Assessment

Upon receipt of a report from the SACS programmer:

- The Data Manager will request a data extract from SACS corresponding to the park and appropriate years of data
- The Data Manager will create an event theme and overlay it over park boundary lines to ensure that the uploaded data falls within the park unit.
 - The plot should record the year and fire number as a label attached to, or adjacent to each fire point. It may be necessary to make multiple plots if there are overlapping fires.
 - Sufficient base data detail should be provided (e.g., roads, rivers, PLSS, etc.) to allow a visual comparison of fire location with terrain or cultural features.
- The checkplot should be sent to the park unit, or office responsible for entering fire data, for approval.
 - If fire locations need to be corrected, the park FMO or designate (e.g., a Fire Program Assistant) should inform the data manager of which fires need to be corrected, and provide a correct location. This can be done by returning the map with corrections, or by sending an e-mail with year, fire number, and correct location for each fire to be corrected.
 - This process is repeated until the FMO accepts the corrected data set.
- A brief report of the outcome of the final location test will be submitted to the SACS SME (Dale Miracle). This report may be submitted by e-mail. With Dale’s approval, the Data Manager will direct the SACS programmers to upload the corrected location data onto the “production” side of SACS.

Creation of FGDC Compliant Metadata

Metadata is information about a GIS database (data about data). It describes several attributes about a particular database. Among those attributes are data quality, data content and data condition. The Federal Geographic Data Committee (FGDC) identifies three major uses of metadata. First, metadata helps to organize and maintain an organization's investment in data. Second, it provides information to data clearinghouses. Finally, metadata aids in data transfer.

National Park Service (NPS) employees must create or have metadata created for each GIS data layer or theme that is created by park employees or by a park's contractor, cooperator or partner. The best time to create metadata is during spatial data creation, when the producer has the most information about the data.

All metadata must comply with the Federal Geographic Data Committee's (FGDC) "Content Standards for Digital Geospatial Metadata." For further discussion on FGDC metadata compliance, refer to the FGDC web page, <http://www.fgdc.gov/>.

For information on metadata please visit the data and information page hosted on the NPS GIS website, http://www.nps.gov/gis/data_info/metadata.html. The NPS Clearinghouse is currently down for repairs.

The following are guidelines for posting digital geospatial data on the NPS Clearinghouse once it is operational.

- Create metadata for each data layer or theme. Several tools are available to assist with metadata creation. ArcCatalog, complimented with the NPS Metadata Tools extension (see below) is recommended. The chosen tool should be able to produce metadata in ASCII text format that is parsable by the Metadata Parser tool (MP).
- Parse the metadata using the Metadata Parser tool. MP may be downloaded from the USGS web site: <http://geochange.er.usgs.gov/pub/tools/metadata/tools/doc/mp.html>, or run from ArcCatalog if using the NPS Metadata Tools. Parsing the metadata and outputting it in ASCII text, HTML and SGML formats allows it to be indexed using the Isite software installed on NPS GIS Clearinghouse Servers. This allows the metadata to be searched via the National Spatial Data Infrastructure (NSDI) Clearinghouse. It is important that the following extensions are used: txt, html, and sgml.
 - Provide your parsed metadata (ASCII text, HTML and SGML formats) and digital geospatial data to the appropriate NPS GIS clearinghouse contact at http://www.nps.gov/gis/posting_data_guidelines.html. It is important that the following file extensions are used with the metadata: txt, html, and sgml.

The NPS Intermountain Region also provides helpful tips and templates for metadata creation, <http://imgis.nps.gov/metadata.html>.

The NPS Metadata Tools Extension for ArcGIS 8.x was created by the Midwest Regional Office and can be downloaded from:

http://www.nature.nps.gov/im/units/mwr/gis/metadata/metadata_tools.htm. It provides tools to import, export, fix, search, and catalog metadata.

Contacts

This document was written by Joanna Seeber Mensher, Ed Delaney and Kathie Hansen. It is meant to serve as documentation for the NPS FPA Data Assembly Team's effort to prepare historic fire occurrence data for Phase I (Preparedness Module) of FPA. It also offers guidance for parks to follow. Due to frequent changes in the development FPA-PM, plans to implement the program, and the data required, data development standards and guidance will need to remain flexible and subject to change. Please see <http://fpa.nifc.gov/>. For questions on this document or other questions on historic fire occurrence, you may contact the following individuals:

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Appendix

- A. Revised DI-1202 (2004) Form: *DI-1202rev04.xls*
- B. Instructions: National Park Service Edited Version of DI-1202:
2004_1202inst.doc
- C. Standardized Spreadsheet for raw SACS data output:
PARK_1202_standard_fields_08172004_krh.xls
- D. Flowchart: How to Validate Fire Occurrence Ignitions Without a Park GIS:
SOP_flowchart_WOParkGIS.pdf
- E. Flowchart: How to Validate Fire Occurrence Ignitions With a Park GIS:
SOP_flowchart_ParkGIS.pdf
- F. Proposed NPS Fire History Standard:
Proposed_NPS_Fire_history_standard_4-03-03.doc
- G. Guidelines for Building Fire History Spatial Data Layers: *Guidelines for building Fire History spatial data layers.pdf*
- H. DI-1202 fire type codes: *doi 1202 fire types codes.doc*