

Inventory & Monitoring Division

National Park Service



Standard Operating Procedure 2.11.2

NPS Unit Boundary Processing: Park Operational Administrative Boundaries

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Summary

Internal SOP; how to process Unit Boundaries for use in IMD, including processing alternate boundaries.

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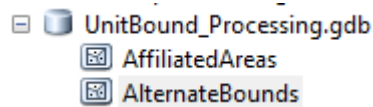
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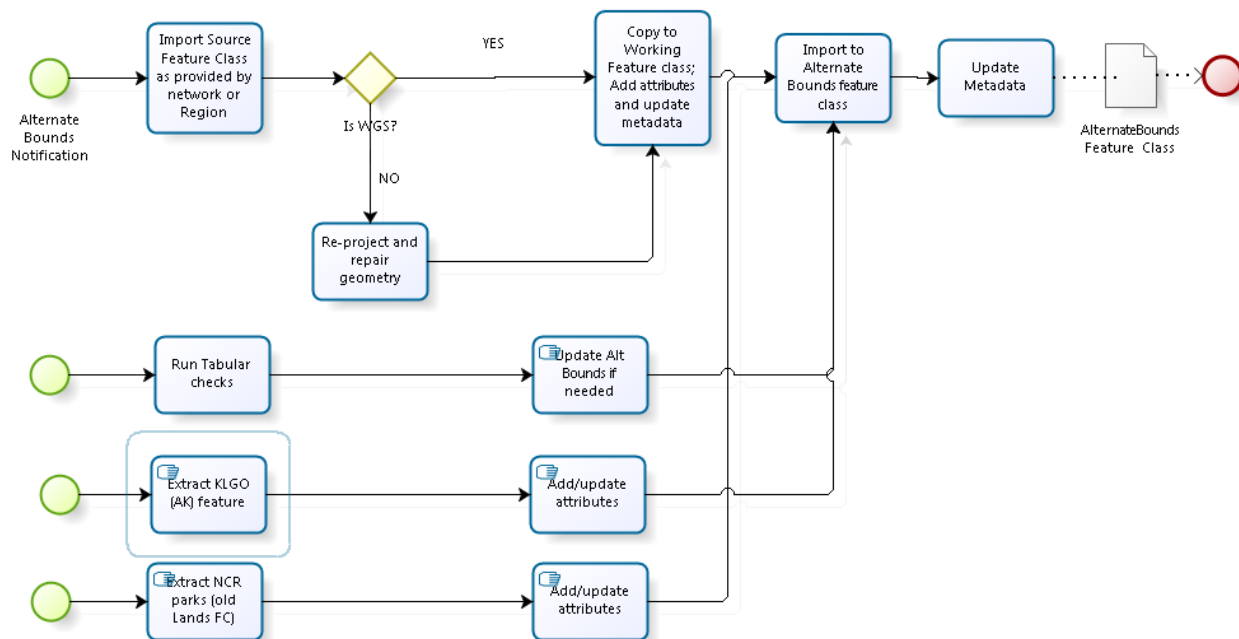
Overview

This SOP details the processing logic and steps to produce the datasets for alternate park unit boundaries used in I&M processing and map services.

The datasets are managed in a file geodatabase on the I&M Central Office shared drive. It is assumed users of this SOP have prior knowledge of data paths, file locations, and repositories referenced in this SOP.



Alternate boundaries are provided by I&M monitoring networks, NPS regional staff, or the I&M central office. The dataset is updated quarterly, as needed. This SOP supersedes all previous versions.



Processing is done manually via an ArcGIS map document.

Requirements

Users of this SOP are required to have:

- ArcGIS 10.2.2+
- Mapped drive to X:\ and read/write permissions on drive

Data providers submit feature classes containing the desired alternate polygon(s) in the correct projection (WGS_1984). If polygons are not in WGS_1984, they are re-projected and geometry is repaired. The feature class should include metadata.

Processing

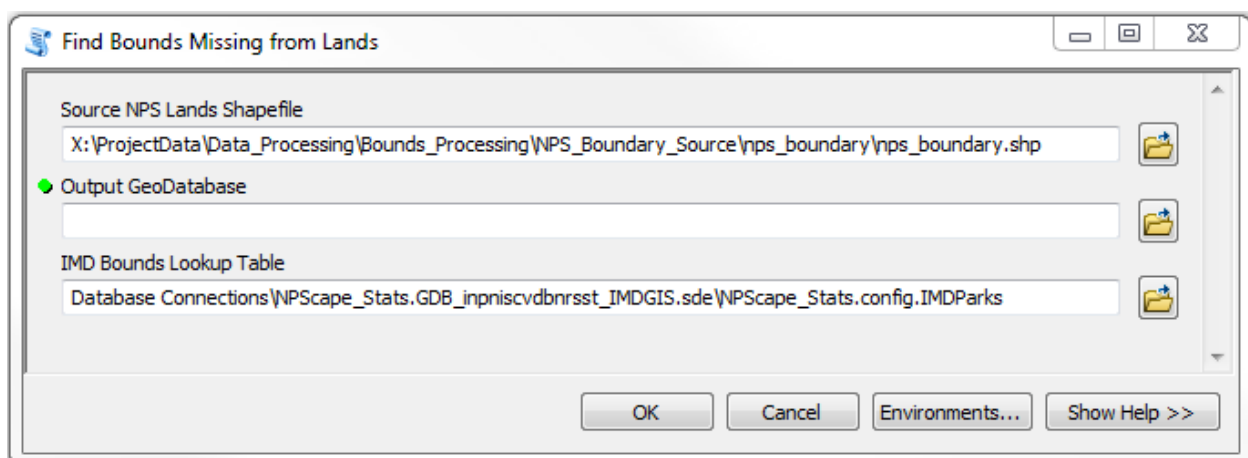
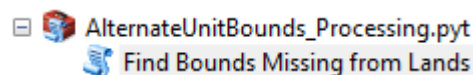
Step 1: Download and prepare NPS Administrative Bounds feature class

1. Rename the existing nps_boundary folder with a datestamp suffix (use date of the most recent LRD release – see Appendix 1) and move existing nps_boundary.zip into the folder:
X:\ProjectData\Data_Processing\Bounds_Processing\NPS_Boundary_Source
2. Download the latest Land Resources administrative boundaries dataset (nps_boundary.zip) from the Data Store – choose Park Boundaries:
<https://irma.nps.gov/DataStore/Reference/Profile/2224545?Inv=True>
 - a. Copy the downloaded zip file to
X:\ProjectData\Data_Processing\Bounds_Processing\NPS_Boundary_Source.
 - b. Extract the contents of the zip file to create this folder:
X:\ProjectData\Data_Processing\Bounds_Processing\NPS_Boundary_Source\nps_boundary.

Step 2: Check for IMD parks missing from LRD

1. Run the “Find Bounds Missing from Lands” tool (in the AlternateUnitBounds_Processing.pyt toolbox) to create a date-stamped table listing any known IMD units missing from the Land Resources Division nps_boundary release.

Output Geodatabase = UnitBound_Processing.gdb



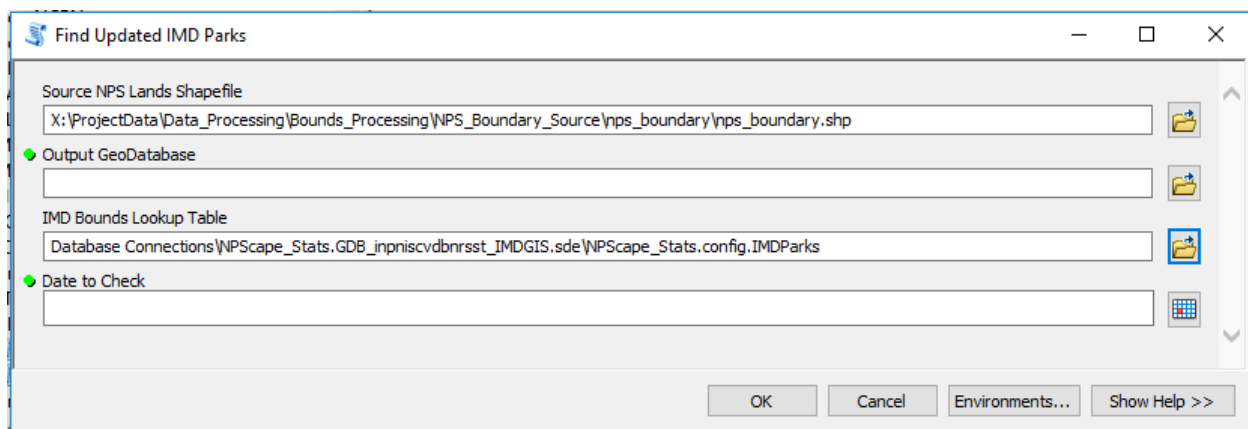
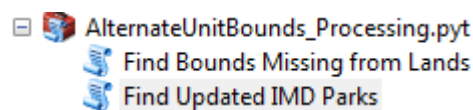
2. In ArcMap, cross-check the resulting list of units
(UnitBound_Processing.gdb\tbl_MissingFromLands_YYYYMMDD) with units in the AlternateBounds feature class (UnitBound_Processing.gdb\AlternateBounds).
3. If a park unit in the “missing from Lands” table is missing from the AlternateBounds feature class, add a feature for it to AlternateBounds following steps similar to ‘Features from Networks or Regions’ process, as described in Step 4 of this SOP.
4. It’s possible that a park might appear in the tbl_MissingFromLands_YYYYMMDD when it had been present in previous versions of nps boundaries. If a park unit that had previously been present suddenly appears in the table, check previous versions of nps_boundary to confirm presence in previous iterations.
 - a. If needed, add these park unit(s) to Alternate Bounds, making note of the addition in this SOP (Appendix 5).

Step 3: Check for IMD parks with LRD update

1. Run the “Find Updated IMD Parks” tool (in the AlternateUnitBounds_Processing.pyt toolbox) to create a date-stamped table listing the IMD features updated since the last release of nps_boundary.shp.

Output Geodatabase = UnitBound_Processing.gdb

Date to Check = Select ‘Date only’, and use the date of the previous LRD update (for example, if processing the June 30 release, use the March 31 date, etc., see Appendix 1).



2. Cross-check the resulting list of units (if any) with those in the AlternateBounds feature class. If Lands geometry is different from AlternateBounds, confirm the update does not replace the Alternate Bounds version, then update the UnitBounds_processing.pyt Python tool code to

delete the unit from the LRD source (if needed). The AlternateBounds feature class is the authoritative source of those select bounds in the feature class.

```
unitsToDelete = [  
    'UNIT_CODE = \'ALKA\'',  
    'UNIT_CODE = \'AMME\'',  
    'UNIT_CODE = \'BICA\'',  
    'UNIT_CODE = \'HAVO\'',  
    'UNIT_CODE = \'KLGO\'',  
    'UNIT_CODE = \'LAKE\'',  
    'UNIT_CODE = \'NPSA\'',  
    'UNIT_CODE = \'RIGR\'',  
    'UNIT_CODE = \'VALR\'',  
    'UNIT_CODE = \'WAPA\''  
]
```

3. If a park Lands change is not in AlternateBounds, compare its feature to the current park feature in the IMD_Bounds.gdb\imd_unit_bounds_albers_py feature class. If the geometry seems significantly different, review with the relevant I&M network and determine if the feature should be added to the AlternateBounds feature class.

Note: AMME is located in both Alternate Bounds and also Affiliated Areas feature classes.

Note: If APPA is updated, a new generalized feature in UnitBound_Processing.gdb should be created for use with SDE and map services. See Appendix 1.

4. If necessary, add any alternate polygons to the Alternate Bounds feature class.

Note: Source of an alternate polygon may be the previous Lands nps_boundary.shp or the current IMDBounds.gdb\unit_bounds_albers feature class.

Note: If a unit bound is neither missing from LRD nor updated by LRD but is present in AlternateBounds, it will be merged into the unit_bounds_wgs feature class produced by the Unit Boundary Processing SOP.

Step 4: Incorporate features from Networks or Regions

Move to Post-Processing if there are no additions or changes to Alternate Bounds.

Note: If adding new units to alternate bounds, create a date stamp copy of the alternate bounds feature class with the most recent LRD boundary release date before editing.

1. Re-project source feature class to Geographic WGS84.
 - a. Use the Project tool to re-project to a temporary feature class (Scratch.gdb). If relevant, the following transforms should be used:

Source Datum NAD83 → WGS84:

WGS84_1984_(ITRF00)_To_NAD_1983

2. Run Repair Geometry on the temporary feature class after re-projecting. Naming convention for network-provided park AOA's:

<NetworkCode>_<ParkCode>_AOA_Park

Naming convention for network-provided park bound (non-AOA):

<NetworkCode>_<ParkCode>_Park

3. Use feature datasets to group network-provided feature classes:

Example: from<NetworkCode>

4. Add (Load) the re-projected alternate polygon to the new (non-date-stamped) Alternate Bounds feature class, and populate any missing attributes as needed.

Dissemination

Step 1: Update and Export Metadata and Post to Data Store

If Alternate Bounds feature class (UnitBound_Processing.gdb) has changed, zip new/updated .gdb for posting to data store. Use Internet Explorer to upload to Data Store.

If nothing was changed in the Alternate Bounds feature class, go to Step 3: Update Unit Bounds.

1. After spatial features are edited (if any) and their attributes updated, edit metadata (when needed) using the ArcCatalog editor and update the processing information section with details on what was added or changed.
2. Using 'Export Metadata' tool, export the metadata for AlternateBounds to stand-alone XML files; delete any existing xml files:
 - a. Use Translator: C:\Program Files (x86)\ArcGIS\Desktop10.6\Metadata\Translator\FGDC2ISO19139.xml
 - b. Output:
X:\ProjectData\Data_Processing\Bounds_Processing\Data\Alternate_Unit_Bounds_ISO19139.xml (replace/overwrite existing)
3. Go to existing data store record for Alternate Bounds,
<https://irma.nps.gov/DataStore/Reference/Profile/2230711?Inv=True>:
 - c. **Actions → Edit**
 - i. Under Permissions, set file access to Specific Individuals and make sure all IMD Central Office staff are included. **Activate** reference.
 - d. **Actions → Edit**

- e. From **Version History** tab, click **Add**
 - i. click “Yes”
 - ii. “Clone this Reference to Create a New Version”
 - iii. Add ***Notes** to identify the update is from a new release of nps_boundary from LRD, include the release date
- f. Update the Date of Issue/Publication to the DATE OF RELEASE of the nps_boundary shapefile from LRD.
- g. Confirm **Permissions** are marked “Public” for Reference Access and File Access.
- h. Under Files and Links, upload
 - i. .zip of UnitBound_Processing.gdb
 - ii. SOP pdf
 - iii. metadata xml file
 - iv. .zip of AlternateUnitBounds_Processing.pyt
- i. **Activate** the reference when all files and links have been uploaded.

Step 2: Update Repo

If any changes were made to the AlternateUnitBounds_Processing.pyt toolbox– make sure to update the repository.

1. Refresh (Pull) local Repo directory containing the toolbox.
2. Move updated/working copy of the toolbox into local Repo directory.
 - a. Push all the changes back to the repo.
 - i. One level up, right click on repo folder → Git GUI Here → “Stage Changed”
 - ii. Enter a meaningful Commit Message → “Commit” → “Push”
 - iii. Confirm any updates posted

Step 3: Update Unit Bounds

Go to SOP 2.11.3 (Kinseth and Nelson 2018) and run the UnitBounds_Processing.pyt\Update Unit Bounds tool as described.

Literature Cited

Kineth, M. and L. Nelson. 2018. NPS unit boundary processing: Reconciliation of official Lands Division and park operational administrative boundaries. Inventory & Monitoring Division Standard Operating Procedure NPS/IMD/SOP—2.11.3. National Park Service, Fort Collins, Colorado.

National Park Service (NPS). 2017. Units & related areas in the National Park System website. <https://www.nps.gov/aboutus/upload/Site-Designations-01-13-17.pdf> (accessed 1/13/2017).

Appendix 1: Data Availability & Known issues

Data availability

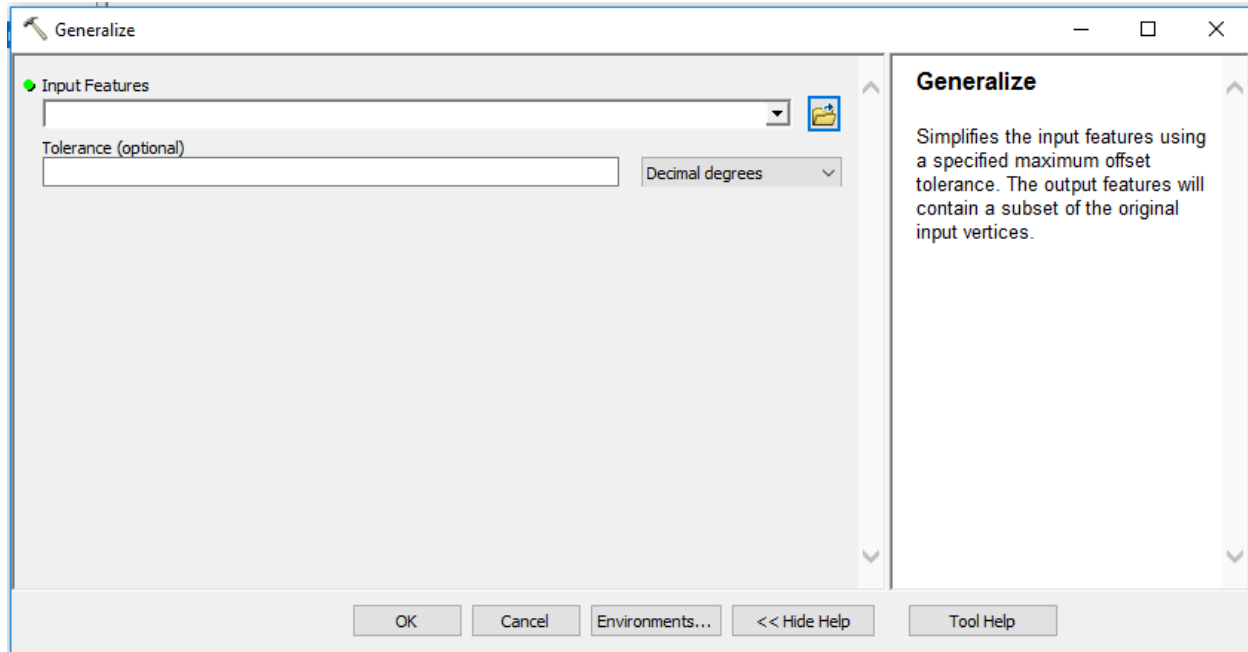
Dependent on Park and/or Network contact to provide direction for use of alternative boundaries.

LRD Release Schedule and Dates

The Land Resources Division has established a quarterly release of nps boundaries. These dates correspond to March 31, June 30, Sept 30, and Dec 31 annually. For the purposes of IMD Boundary processing and AOA creation, even if a release occurs many days past these established 'release' days, the date on record for boundary release will be the quarterly date as noted here.

APPA

To generalize an updated APPA boundary for use in services, use the Generalize tool. The input feature is the source APPA feature from nps_boundary.shp. Use minimal Tolerance to achieve the desired generalized feature.



Appendix 2: Alternate Boundaries - Previous Versions

Prior to August 2015, alternate unit boundaries were maintained as a feature class in the NPS bounds master geodatabase:

X:\ProjectData\Data_Processing\NPS_Bounds\NPS_Boundary_Master\nps_bounds_master.gdb\nps_missing.

These features were merged into the legacy nps_bounds_* feature classes in the same geodatabase using the archived SOP: X:\ProjectData\Data_Processing\NPS_Bounds\SOP_Processing_NPS_Bounds.doc

Appendix 3: Affiliated Areas – Previous Versions

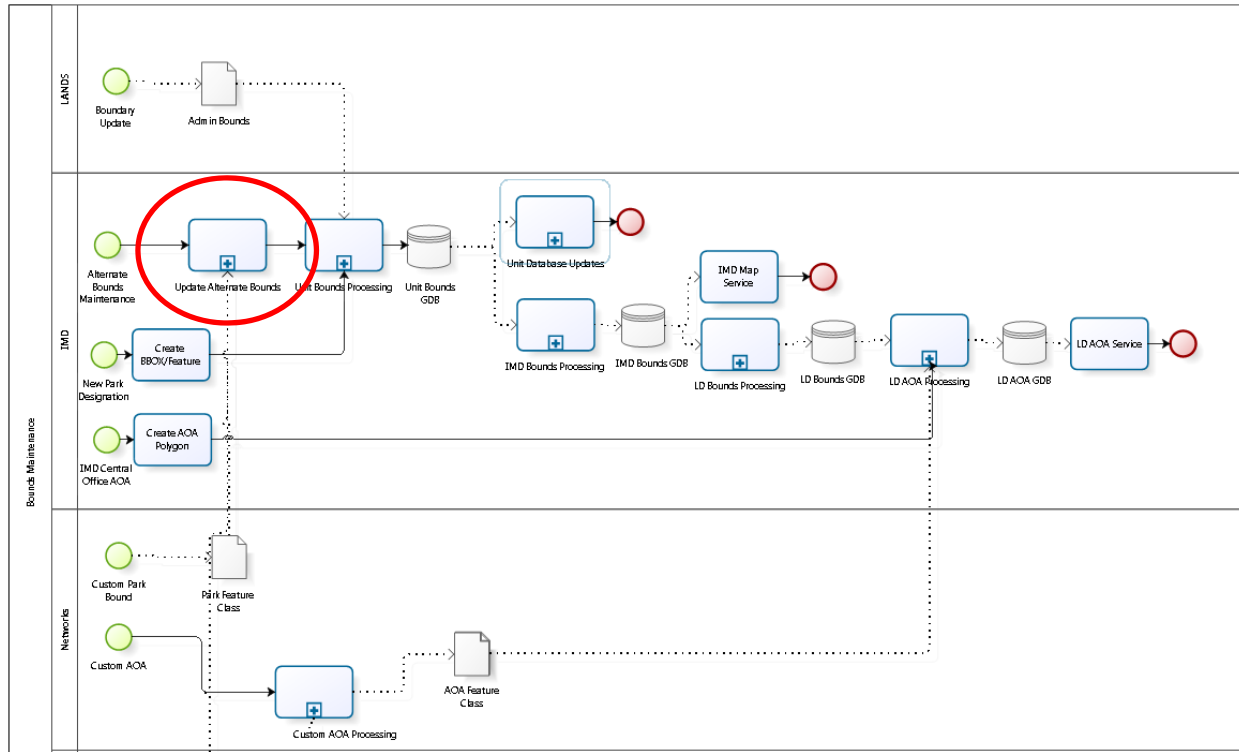
Prior to August 2015, affiliated area boundaries were maintained as a feature class in the NPS bounds master geodatabase:

X:\ProjectData\Data_Processing\NPS_Bounds\NPS_Boundary_Master\nps_bounds_master.gdb\nps_affiliated_areas.

These features were copied into the current UnitBound_Processing.gdb geodatabase. These attributes were deleted: STATE, REGION, METADATA, CREATED_BY, PARKNAME, UNIT_TYPE. The Feature_Source and Full_Name attributes were added and calculated. These processes are recorded in the Alternate_Affiliated_Bounds_Processing.mxd map document.

Appendix 4: Boundary Maintenance Process Summary

The alternate unit boundary processing is a component of the overall boundary maintenance conducted by the I&M central office.



Appendix 5: Alternate Boundaries and Affiliated Areas – Current

Details of additions to Alternated Boundaries or Affiliated Areas feature classes.

Klondike Gold Rush Seattle Visitor's Center (KLSE)

The Seattle Visitor's Center parcel (original source from 2012 File GDB) for Alaska's Klondike Goldrush (KLGO) was added as a unique parcel, unit code KLSE. The resulting feature class is KLSE_WGS84 in

X:\ProjectData\Data_Processing\Bounds_Processing\Data\UnitBound_Processing.gdb

World War II Valor in the Pacific (VALR)

The VALR boundary provided by Lands includes the California visitor center parcel as well as additional, smaller parcels at the HI location. These impact subsequent processing done by IMD: IMD bounds, IMD map services and Landscape Dynamics AOAs. Per direction from PACN, the Lands VALR feature was converted to a single-part feature class and the non-Hawaii parcel removed. PACN staff then identified the relevant remaining parcels from the Lands layer to include in the final layer, while contributing another parcel not included in Lands for use. The unwanted Lands parcels were removed, and the PACN-provided parcel was merged with the remaining Lands parcels to create a custom VALR boundary for I&M/PACN use. The remaining parcels were dissolved into a multi-part feature class on UNIT_CODE and attribution was edited as needed. The resulting feature class is PACN_VALR_AOA_Park in X:\ProjectData\Data_Processing\Bounds_Processing\Data\UnitBound_Processing.gdb. Finally, the feature from IMD_VALR was copied into the AlternateBounds feature class and its attribution was completed.

NCRN Network Parks and Subunits

Data provided 20151104 (previously 20150918) from National Capital Region Network (X:\ProjectData\Data_Processing\Bounds_Processing\fromNCRN\20151104_NPScape). Subunit features were unchanged from the 20150918 processing. Landscape Dynamics units were re-processed from 20151104 source. Park and subunit feature classes were created and incorporated into the AlternateBounds feature class in the UnitBound_Processing.gdb database. A total of 11 park boundaries and 20 subunit boundaries were added. Processing steps are documented in the Alternate_Affiliated_Bounds_Processing.mxd map document. For the 20150918 processing, note that output feature classes were renamed manually to conform with naming convention after processing was completed using the MXD.

General processing steps:

- Park boundaries: dissolve on AdminCode or UnitCode (reprojecting to WGS84 by outputting to fromNCRN_YYYYMMDD feature dataset), repair geometry, add to interim NCRN_Boundary_all feature class in UnitBound_Processing.gdb, populate attributes

- Subunit boundaries: select feature from parent park boundary feature class, export to new feature class, dissolve on UnitCode or ParkName (if needed), repair geometry, add to interim NCRN_Boundary_all feature class in UnitBound_Processing.gdb, populate attributes
- Note: subunit features are not removed from ‘parent’ features. For example, resulting NACE feature includes ANAC and other subunits.
- Create a datestamped copy of AlternateBounds and delete the following features from AlternateBounds. Repair geometry.
 - o HAHA (20150918)
 - o SEBE (20150918)
 - o ANTI (20151104)
 - o CATO (20151104)
 - o CHOH (20151104)
 - o GWMP (20151104)
 - o HAFE (20151104)
 - o MANA (20151104)
 - o MONO (20151104)
 - o NACE (20151104)
 - o PRWI (20151104)
 - o ROCR (20151104)
 - o WOTR (20151104)
- Append interim NCRN_Boundary_all feature class to AlternateBounds. Update attributes as needed. Repair geometry.

Details on source bounds for subunits:

- from GWMP:
 - o ARHO, BATT, GLEC, GRFA
 - o GWMP (note – this feature does not include other subunits),
 - o Subunits not used:

- CLBA and THIS - identical to Lands
 - LBJG - identical to LYBA from Lands
- from NACE:
 - o ANAC, CAWO, FODU, FOFO, FRDO, GREE, OXHI, PISC, SEBE, SUIT, KEPA, HAHA, MABE
 - o Subunits not used:
 - DC Armory, Folger Park, Fort Chaplin, Fort Stanton, Lincoln Park, Marion Park
 - FOWA – identical to Lands
- From ROCR:
 - o ROCR: CUEC, FOCL, ROCR
 - o All others not added
 - o ROCR includes Rock Creek Park, Potomac Palisades Parkway and Rock Creek & Potomac Parkway features (c.f. with extent of water quality monitoring sites in DM_WaterChemistry)

PARA Boundary

The Grand Canyon-Parashant boundary obtained from BLM was snapped to the Grand Canyon boundary to remove slivers and donuts. The resulting feature class is MOJN_PARA_AOA_Park in X:\ProjectData\Data_Processing\Bounds_Processing\Data\UnitBound_Processing.gdb. The AlternateBounds feature class was updated by swapping in this polygon.

See email correspondence between David Gundlach and Michelle Kineth (December 2014) for more about PARA (and LAKE).

ROVA Boundary

The Roosevelt-Vanderbilt National Historic Sites bound (currently named Roosevelt-Vanderbilt Headquarters) has been corrected by merging ELRO, HOFR, and VAMA features produced by Lands into a new feature for ROVA. The resulting feature class is IMD_ROVA in X:\ProjectData\Data_Processing\Bounds_Processing\Data\UnitBound_Processing.gdb. Will need to update the Unit DB as well.

TUPE, BRRCR, NATR Boundaries

The NATR data from NPS BioBlitz 2016 included alternate bounds for units TUPE (Tupelo National Battlefield), and BRRCR (Brices Cross Roads National Battlefield Site) and NATR (Natchez Trace Parkway). These were added to the Alternate Bounds feature class. The resulting feature classes are IMD_TUPE, IMD_BRRCR, IMD_NATR in

X:\ProjectData\Data_Processing\Bounds_Processing\Data\UnitBound_Processing.gdb\fromBioBlitz_2016

LAVO, ORCA, and REDW Boundaries

Polygons come directly from Kalamath Network

(X:\ProjectData\Data_Processing\Bounds_Processing\fromKLMN\KLMN_Alt_Park.gdb), boundaries for these three parks were provided that excludes the small administrative parcels located outside the main park area. The resulting feature classes are KLMN_LAVO_AOA_Park, KLMN_ORCA_AOA_Park, KLMN_REDW_AOA_Park in X:\ProjectData\Data_Processing\Bounds_Processing\Data\UnitBound_Processing.gdb. Park bounds were reprojected from USA_Contiguous_Albers_Equal_Area_Conic_USGS_version to WGS84 and added to Alternate Bounds feature class.

GLAC Boundary

GLAC boundary adapted from Land Resources and excludes the small administrative parcels located outside (to the East of) the main park area. The resulting feature class is Lands_GLAC_AOA_Park in X:\ProjectData\Data_Processing\Bounds_Processing\Data\UnitBound_Processing.gdb. Added to Alternate Bounds feature class.

DRTO Boundary

The small administrative parcel located to the east of the larger park unit was removed, and the remaining parcel shapefile was reprojected from NAD83 UTM to WGS84. The resulting feature class is Lands_DRTO_AOA_Park in

X:\ProjectData\Data_Processing\Bounds_Processing\Data\UnitBound_Processing.gdb. Added to Alternate Bounds feature class.

CRMP/CRMO (Preserve) Boundary

Per email correspondence with UCBN, CRMP (Preserve) portion to include NPS lands only. From source (crmp_tracts.shp), FED status lands were exported and dissolved into a multipart polygon. Re-projected to WGS84 and added to Alternate Bounds feature class (and IMD_CRMP_AOA_Park added to UnitBound_Processing.gdb).

NOTE: Changed UNIT_CODE in Alternate Bounds from CRMP to CRMO (this is to facilitate dissolving Park and Preserve into one Park unit when running IMDBounds_Processing).

See X:\ProjectData\Data_Processing\Bounds_Processing\CRMO\CRMO_NPS_Only.mxd

2016 BioBlitz (iNaturalist) Boundaries

ACAD, CONG, GRSM, KIMO, MABI, NISI, OLYM, PIPE: Boundaries provided by respective parks for 2016 BioBlitz effort; park boundaries appended to Alternate Bounds feature class. PIPE only – reprojected from WGS84 Web Mercator to WGS84 before appending to Alternate Bounds feature class. The resulting feature classes are IMD_<PARK_CODE>_AOA_Park in X:\ProjectData\Data_Processing\Bounds_Processing\Data\UnitBound_Processing.gdb\fromBioBlitz_2016

See also (TUPE, BRCR, and NATR Boundaries section above)

See also

X:\ProjectData\Data_Processing\Bounds_Processing\Alternate_Affiliated_Bounds_Processing_iNaturalistBioBlitz2016.mxd, and <https://irma.nps.gov/DataStore/Reference/Profile/2227439>

BEPA → BEAR

Bear Paw Battlefield alternate boundary unit code was changed from BEPA to BEAR to accommodate the new unit Belmont-Paul Women's Equality National Monument (BEPA). No changes were made to the spatial data for BEAR.

PRSF Boundary

The September 30, 2017 release of nps boundary from LRD did not include a PRSF unit boundary. The Legacy boundaries from the June 30, 2017 release of nps boundary have been added to the Alternate Boundary feature class.

Per email correspondence with Roger Johnson, LRD (Nov. 1, 2017), PRSF was removed from nps_boundary because it is part of GOGA and not a legislatively declared unit of its own. Though this is the case, it was decided (discussion b/w Lisa and Michelle, Nov. 1, 2017) that IMD would maintain PRSF as a unique unit in Alternate Bounds (and subsequently Unit Bounds) moving forward.

ILMI Boundary

The September 30, 2017 release of nps boundary from LRD did not include ILMI unit boundary, though it had previously been present in the LRD release. The Legacy boundary for ILMI from the June 30, 2017 release of nps boundary has been added to the Affiliated Areas feature class.

Per email correspondence with Roger Johnson, LRD (Nov. 1, 2017), ILMI was removed because it is a National Heritage Area and not legislatively declared (NPS 2017). Though this is the case, it was decided (discussion b/w Lisa and Michelle, Nov. 1, 2017) that IMD would maintain ILMI as a unique unit in Affiliated Areas (and subsequently Unit Bounds) moving forward.

CRLA boundary

The June 30, 2017 release of nps boundary from LRD included an update of CRLA that included two very small disparate parcels some distance from the main park area. Per email communication with KLMN, these two small parcels are excluded from CRLA. CRLA was re-projected from NAD83 to WGS84 and added to Alternate Bounds.

CAHE and FOMO bounds

In previous iterations of AlternateBounds, CAHE and FOMO features existed as placeholder polys created in 2008 by buffering a screen-digitized 'centroid'. On 20180110, these features were replaced with more detailed polygons via screen digitizing. This change is in response to an email from Tom Philippi on 20171114 expressing problems using the unit_bounds feature class in R.

INPE bound

In previous iterations of AlternateBounds, the INPE feature existed as a placeholder polys created in 2008 by buffering a screen-digitized 'centroid'. On 20180702, this feature was replaced with a more detailed polygon via screen digitizing.

Subunits for reporting

Selected multi-part park features in unit_bounds_wgs were exploded into subunits with updated unit codes and names and added to the AlternateBounds feature class.

MAPR_Hanford

MAPR_LosAlamos

MAPR_Oakridge

MIIN_Bainbridge

MIIN_Idaho

NEPE_BearPaw_MT

NEPE_NezPerce_ID

NEPE_NezPerce_OR

SAGU_Rincon

SAGU_Tucson

THRO_Elkhorn

THRO_North

THRO_South