ENVIRONMENTAL STEWARDSHIP
OPERATIONAL CONDITION ASSESSMENT PROCESS: BOUNDARY FIELD GUIDE

1.0 PURPOSE - ENVIRONMENTAL STEWARDSHIP OPERATIONAL CONDITION ASSESSMENT BOUNDARY.

The Environmental Stewardship (ENS) business line has the responsibility to identify nationally consistent evaluation criteria for specific assets managed under the purview of the program. The purpose of this guide is to serve as the ENS-Boundary OCA training and procedural field manual; providing specific detail into the assessment process.

2.0 BACKGROUND.

2.1 Asset Management (AM) Program.

Based on policy issued by the Director of Civil Works in 2014, USACE business lines began implementation of maintenance management, operational condition assessments, operational risk assessments, and asset management portfolio analytics. Per the Asset Management Program Management Plan, "the Civil Works Asset Management objective is to optimize the delivery of asset value by developing and implementing a risk-informed lifecycle investment and management strategy for the existing and future USACE Civil Works infrastructure portfolio."

2.2 Operational Condition Assessment (OCA) Framework and Policy.

The objective of the OCA process is to obtain nationally consistent operational condition data of the highest possible quality in order to identify all current and reasonably foreseeable future condition states (EC 11-2-218).
Engineer Circular (EC) 11-2-218 dated 31 March 2019 provides a written interpretation of "operational condition" and "assessment" as they relate to USACE's Asset Management Program. The term "operational condition" refers specifically to the following properties of a component: (a) condition state, specifically, the degree of severity of an observed and/or documented deficiency and (b) the level or degree to which a deficiency degrades the component's performance, alters operational procedures, and/or increases its maintenance requirements. The term "assessment" refers to the use of existing data, as much as possible, to accurately determine the asset's operability and readiness. The guidance notes that onsite observations may take place during an OCA, but that it is not a comprehensive inspection of all assets at a project.

2.3 Boundary OCAs.

Boundary features are USACE assets and as such shall be evaluated for condition and risks (Policy Memorandum, 10 May 2019). The OCA process for boundary within the ENS Business Line has been developed specifically to accomplish the following:

- Provide a means to track components and their conditions (asset visibility) through the use of hierarchical component lists for USACE ENS assets specifically related to boundary.
- Provide a common, consistent, and repeatable OCA process. The OCA process is repeatable both in terms of the process itself and the generated outcomes.

To develop the OCA for boundary, the following processes and considerations occurred:

- Conducted a review of all applicable data standards for boundary management in order to develop guidance for adherence to all standards.
- Evaluation of existing technologies to collect, aggregate, store, and visualize boundary management data at temporal and spatial scales to ensure consistency with management objectives and assessment criteria; the development of recommendations for integration of data from a variety of sources in the assessment process.
- A review of existing boundary inspection and maintenance policies in place to include the identification of potential inconsistencies; ensured alignment with recommendations from national program boundary management audit and Asset Management Program requirements.
- Development of a condition-consequence index framework for boundary condition assessment; tested and refined the framework with field ground truth pilot tests.
- Ensured existing boundary management information collected from the field at the national program level satisfied the requirements for condition assessment and identified what improvements were necessary; sought input and coordinated proposed improvements with the national Stewardship Advisory Team (SAT) and program leadership.
- Developed a method for integration of condition-consequence index output into the budget process.
- Drafted implementation guidance for boundary OCA process for use by the field and HQ program leadership. Submission to national Asset Management Program.
- Production of boundary guidance clarifying flowage easement rights policy.

3.0 BOUNDARY DATA COLLECTION FOR OPERATIONAL RISK ASSESSMENT (ORA).

3.1 Data Collected & Sources.

Data used to produce risk assessments is drawn from multiple resources, both internally generated and from outside sources. Business data for boundary asset condition such as inspections and maintenance work, estimates of missing or damaged monuments, and newly identified encroachments yet to be accounted for in the Corps Real Estate program is collected via a field data call with the Natural Resource Management program on an annual basis. This data is developed at the project level, with QA/QC taking place with the Districts and again at the MSC level before being compiled into a national dataset.

Data used in the ORA framework that was not produced by the Natural Resource Management program was downloaded from national systems to ensure comparability among all projects. Sources of these datasets include The Nature Conservancy, the Environmental Protection Agency, and the USACE Hydrologic Engineering Center.

3.2 Data Input.

Tabular data has been aligned with officially used Project Site Identifiers (PSID) administrative codes and Civil Works Information System (CWIS) codes. Metrics produced using spatial overlay analysis have also utilized PSID and CWIS codes to align output with the ORA analytical framework.

3.3 Data Storage.

Currently, all compiled data is stored locally and scoring functions are carried out in an excel workbook. All datasets have been individually backed up in their original format both locally and on a network drive hosted by USACE IWR (Institute for Water Resources).
For application purposes, this effort seeks to compile data used for the boundary ORA on a portal partners site upon approval of the framework by the USACE Asset Management program. This environment is where alignment with appropriate codes, spatial data processing, field data collection applications, scoring functions, and generation of output to be provided to the NRM Assessment and Asset Management information systems will take place. The graphic below demonstrates this desired workflow.
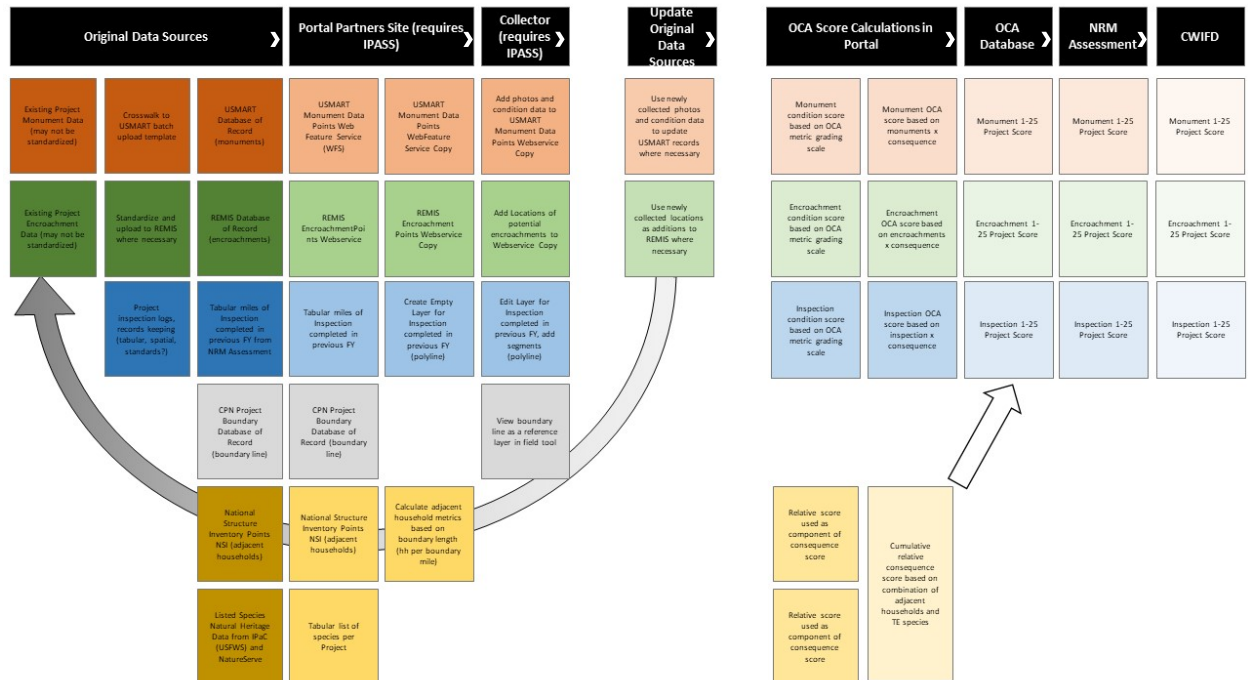
Figure 1. Map of where assessment process goes (data collection to OCA database to NRM assessment for field verification to CWIFD for budget package ranking)

4.0 OCA BOUNDARY PROCESS & SCORING.

4.1 Internal Condition Metrics.

The following represents the metrics used to assess boundary condition, and the associated Work Category Code:

- Monumentation 61453 (inventory completeness – USMART). The percent of monument locations stored in USMART, the physical condition of monuments with information stored in USMART, and the estimated percent of monuments that are physically damaged or missing
- Boundary certification 61453 (field reporting). This is supplemental information included in the worksheet and does not impact the OCA score.
- Maintenance 61454 (field reporting) – Percent of physical boundary maintained during previous FY.
- Inspection 61454 (field reporting) – Percent of physical boundary inspected during previous FY. Compliance inspections ensure the proper features are in place to identify the boundary and its integrity (Policy Memorandum 10 May 2019)
- Newly identified encroachments 61452 (field reporting) – Encroachments not yet entered into REMIS
- Reported encroachments 61452 (REMIS)

Each condition metric is associated with a specific work category code (WCC). Surveying and monumentation metrics are scored together, inspection and maintenance metrics are scored together, and encroachment metrics are scored together to produce three distinct WCC condition scores.

Each condition metric has had the upper and lower bounds of acceptable values for each grade identified by the Project Delivery Team (PDT). This is based on existing policy where available, and informed by operational knowledge of the Natural Resource Management program.

- Metric values for each project are scored proportionately based on each project's metric measurement and the condition grading values for each metric.
- Metric weights within a WCC are applied to the project metric grade.
- All weighted metric scores associated with a specific WCC are added together.
- The sum of these scores is divided by the maximum total score possible, resulting in a value on a scale between 0 and 1.
- High levels of development surrounding a project are associated with an increased likelihood of a high number of new encroachments occurring. Projects with high levels of measured development in areas adjacent to the project boundary may have a value of up to 0.25 removed from their condition score.
- Project scores of:
  - 0 and less than 0.2 receive an "F"
  - 0.2 and less than 0.4 receive a "D"
  - 0.4 and less than 0.6 receive a "C"
  - 0.6 and less than 0.8 receive a "B"
  - Greater than 0.8 receive an "A"

Internal Condition Scoring Metrics	Consequence Scoring Formulas					
	A (upper)	A (lower)	B (lower)	C (lower)	D (lower)	F (lower)
Percent of Monuments in DOR (UMSART)	100	100	80	70	60	0
Percent of Monuments in Degraded Condition (USMART)	0	4	10	15	20	100
Percent of Missing Monuments in FY19 (NRM Assessment)	0	4	5	10	15	100
Percent Fee Boundary Inspected in FY19 (NRM Assessment)	100	34	30	25	20	0
Percent Fee Boundary Maintained in FY19 (NRM Assessment)	100	34	30	25	20	0
Encroachments to be Entered into REMIS (NRM Assessment)	0	1	5	10	20	484
FY18-19 All Encroachments (REMIS)	0	1	5	10	20	902
External Condition Scoring Metrics	1st quintile (lower)	1st quintile (upper)	2nd quintile (upper)	3rd quintile (upper)	4th quintile (upper)	5th quintile (upper)
Count of Land Based Use Permits/Licenses	0	21.6	78.2	223	626	14087
Count of Adjacent Structures (NSI)	0	8	24.8	133.6	665.6	46321

Table 1. Condition metrics and associated grading thresholds.

4.2 External Condition and Probability of Failure.

The following represents the metrics used to assess external condition and probability of failure.

- Count of adjacent structures (National Structure Inventory - NSI)
- Count of total land use permits (field reporting)

To assign a score, the following process was developed and utilized:

- A total count of structures identified in the National Structure Inventory has been measured for each project.
- A total count of land use permits for each project has been collected from the NRM Assessment system.
- Based on their value in relation to quintiles of both the NSI and land use permit datasets, and in proportion to the maximum value of the quintile in which they fall, the amount of reduction to each project's condition score is calculated. This only applies to projects in either the fourth of fifth quintile for either or both the NSI and land use permit datasets. For example, a project with an NSI structure count within the fifth quintile, and a land use permit count within the third quintile, may have up to 0.2 removed from its total WCC condition score.

	Permit 1st Quintile	Permit 2nd Quintile	Permit 3rd Quintile	Permit 4th Quintile	Permit 5th Quintile
NSI 5th Quintile	Decrease score up to 20%	Decrease score up to 20%	Decrease score up to 20%	Decrease score up to 20%	Decrease score up to 25%
NSI 4th Quintile	Decrease score up to 10%	Decrease score up to 10%	Decrease score up to 10%	Decrease score up to 10%	Decrease score up to 20%
NSI 3rd Quintile	Decrease score 0%	Decrease score 0%	Decrease score 0%	Decrease score up to 10%	Decrease score up to 20%
NSI 2nd Quintile	Decrease score 0%	Decrease score 0%	Decrease score 0%	Decrease score up to 10%	Decrease score up to 20%
NSI 1st Quintile	Decrease score 0%	Decrease score 0%	Decrease score 0%	Decrease score 10%	Decrease score up to 20%

Table 2. Potential impacts to condition scores for projects with land use permits and adjacent structures.

4.3 Consequence Metrics.

The following represents the metrics used in determining consequence.

- Acres of project that overlap The Nature Conservancy (TNC) priority conservation areas (see appendix).
- Percent of project that overlaps TNC priority conservation areas (see appendix).
- Presence of special status species (NRM Assessment Data).
- Percent of project that overlaps areas associated with Morphological Spatial Pattern Analysis (MSPA) ecological corridors (see appendix).

To assign a score, the following process was developed and utilized:

- Individual consequence metrics are scored based on their value within the upper and lower bounds of quintiles of the entire dataset. For example, projects with values in the fifth quintile are then scored proportionately to the maximum value in the dataset; projects with values in the fourth quintile are scored proportionately to the maximum value of the fourth quintile, etc.
- Metric weights are applied to each project's metric score.
- All weighted metric scores are added together.
- The sum of these scores is divided by the maximum total score possible, resulting in a value on a scale between 0 and 1.

- The weighted score sum is compared to the minimum threshold metrics: 1. the count of business lines a project serves, and 2. whether a project has a shoreline management program) to ensure it is no lower than the consequence criteria will allow. This ensures that projects serving numerous operational business lines and/or have a shoreline management program have this information accounted for when producing an assessment of consequences of boundary failure.
- Projects serving three business lines may have a minimum score of no lower than 0.4 out of a maximum score of 1; projects serving more than three business lines may have a minimum score no lower than 0.6 out of a maximum of 1.
- These 0.0-1 scores are then translated into a value of "I-V", based on their proportion of the maximum possible score. A high consequence project will be "I," while a low consequence project will be "V."

Consequence Scoring Metrics	Consequence Scoring Formulas					
	I (upper)	I (lower)	II (lower)	III (lower)	IV (lower)	V (lower)
Count of Blines						
Acres TNC Priority Conservation Areas (TNC)	136859	11794	3247	1126	323	0
Percent TNC Priority Conservation Areas (TNC)	100%	93%	57%	31%	8%	0%
Special Status Species	18	7	3	2	1	0
Percent Connectivity Matrix (MSPA)	100%	90%	82%	70%	49%	0%

Table 3. Consequence metrics and consequence category threshold values.

4.4 Map of the Process of Source Data to 1-25 WCC Score by Project.

- Calculate project condition (OCA) score by WCC (A-F and corresponding numeric value 0-1).
- Calculate project consequence score (I-V and corresponding numeric value 0-1).
- Determine project ORA value (1-25) by WCC based on combination of condition and consequence score. For example, a condition score "B" in combination with a consequence score of "III" will result in an ORA score of 18.

	CONDITION CLASSIFICATION				
	F	D	C	B	A
I	1	2	6	10	15
II	3	5	9	14	19
III	4	8	13	18	22
IV	7	12	17	21	24
V	11	16	20	23	25

CONSEQUENCE CATEGORY

Figure 2. Relative risk ranking matrix for all business lines.

5.0 REFERENCES.

EC 11-2-218, 31 March 2019, Policy for Operational Condition Assessments of USACE Assets

Policy Memorandum (10 May 2019) U.S. Army Corps of Engineers Boundary Management and Encroachment Resolution

Appendix A: ORA Metrics Maintained by USACE Outside the Natural Resource Management Program

1. **REMIS.**

   A report for all encroachments was generated January 2020. Encroachments identified in this report were matched to their associated project PSID and CWIS codes for use in the ORA framework. A sum of all reported encroachments is utilized in the OCA score and subsequent ORA score, based on grading criteria developed by the PDT.

2. **USMART.**

   USMART is the database of record (DOR) for project control points and boundary monument spatial data inventory, including their physical coordinates and condition. Data for individual projects may be accessed via the CAC-enabled website, or via web feature services.

   http://usmart.usace.army.mil/

3. **National Structure Inventory.**

   The National Structure Inventory (NSI) database is a nationally consistent database of all structures, their locations, and structure details (e.g., number of stories, type of structure, structure value, etc.) across all 50 states of the United States. This database is housed and updated by a team at USACE's Hydrologic Engineering Center (HEC) led by Will Lehman, Senior Economist. For more details on how these data are derived, please visit the NSI GitHub.

   (https://github.com/HydrologicEngineeringCenter/NSI#usace-developed-nsi-base-data).

   The NSI data were used to estimate the total number of structures within a 100 yard buffer around each NRM project. While the total count of all structure types is currently used in the ENS OCA scoring tool, further detail is available on the counts of different structure types like residential vs. agricultural for future investigations. The total count of structures adjacent to a project is intended to be an indicator of the degree of development pressure on a given project. For example, **Error! Reference source not found.** shows the NSI structures adjacent to Lake Lanier (left) and Raystown Lake (right). While there are a total of about 14,000 structures adjacent to Lake Lanier, Raystown only has about 300 structures adjacent to it, suggesting that Lanier may have a higher probability of new encroachments.

   The following general steps were followed to arrive at NSI structure counts for each NRM project:

1. Create spatial layer of just the 100 yard buffer around each NRM project.
2. Intersect the NRM project 100 yard buffer layer with the NSI point layer (done by state due to heavy computational requirements).
3. Merge all state-level intersections into one national NRM 100yard buffer and NSI structure intersection.
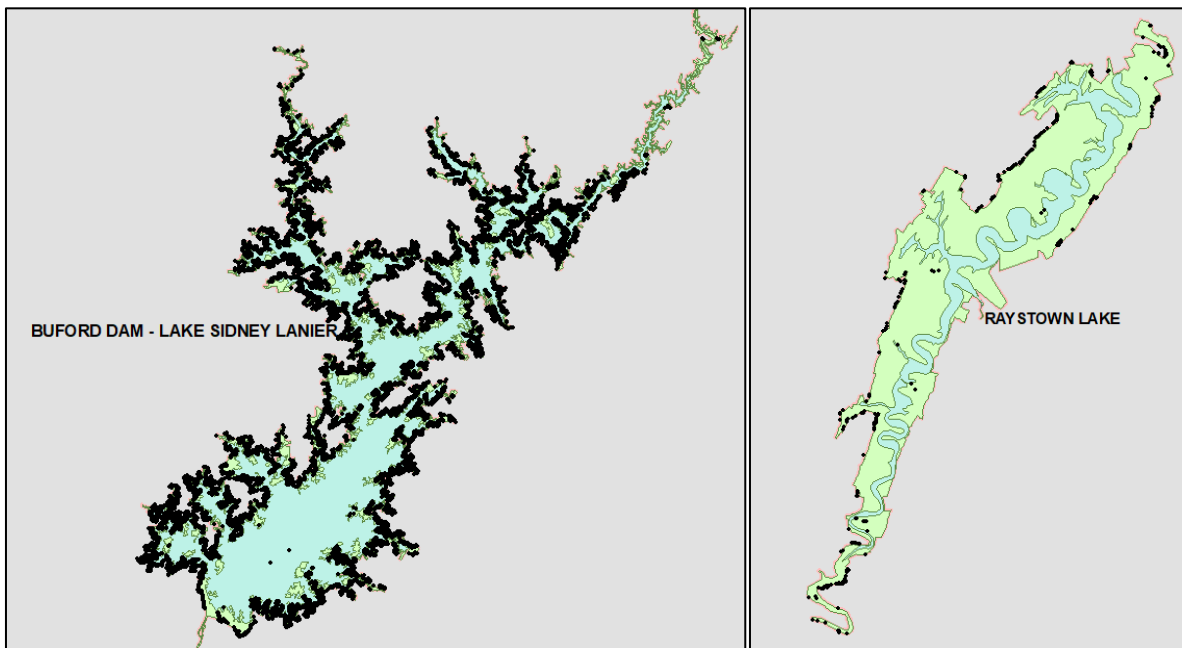4. Export layer data to excel and create pivot table, showing total NSI count by PSID.

Figure 3. NSI structures (points) falling within a 100 yard buffer (pink border) around Lake Lanier (left) and Raystown Lake (right). Note that the green areas represent project land and the blue is project water.
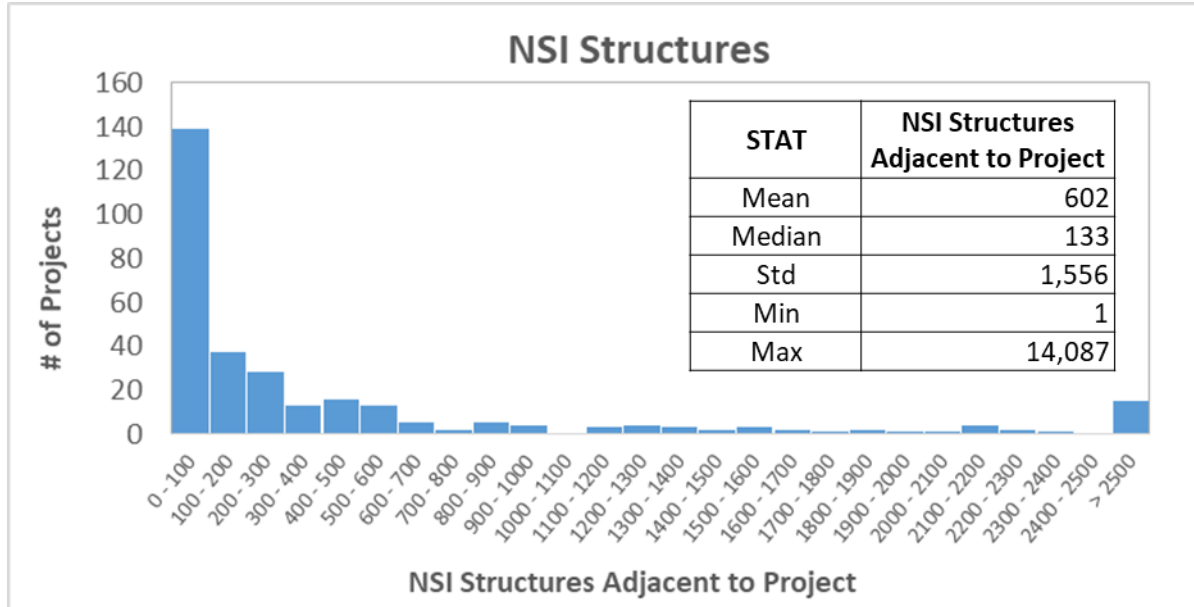
Figure 4. Distribution across NRM projects of the total count of NSI structures adjacent to project lands (i.e., within a 100-yard buffer around the project). A majority of projects (about 58%) have 200 or fewer structures adjacent to their lands. A total of 15 projects (5% of projects analyzed) have 2,500 or more structures adjacent to their land.

Note: A portion of ENS projects do not have spatial data delineating project boundaries. Out of 430 projects, 384 had sufficient spatial data to perform the analysis with the NSI data. Due to unresolved issues with analysis, no NSI counts are available for Florida (2 projects). Nationwide 75 projects had zero adjacent NSI structures (i.e., within 100 yard radius).

4. Operations Data by Project.

An initial estimate of the number of business lines at each ENS project was made by pulling project lists from a combination of sources including the OMBIL universe in EDW (Enterprise Data Warehouse) as well as business line PDT's. Data sources for each business line are as follows:

- FRM: OMBIL Flood Risk Management Universe (EDW)
- WTR: OMBIL Water Supply Universe (EDW)
- HYD: OMBIL Hydropower Universe (EDW)
- REC: Project list provided by Wen Chang (IWR NRM lead)
- NAV: EDW report cross-walking CEFMS, P2, OMBIL metrics (provided by Justin Carlson)
- ENS: NRM Assessment

Project lists were pulled by business line and then cross-walked with the ENS project list to determine which business lines were represented at each ENS project. The final 'Count of Business Lines' metric was computed by summing the number of business lines at each ENS project.

The 'Count of Business Lines' metrics is used as a measure of consequence. Projects with more business lines are assumed to experience greater consequences (i.e., negative impacts on their ability to fulfill their mission) than those with fewer business lines due to encroachments.

NOTE: These business line counts are preliminary and should be scrutinized by the ENS OCA team and field. Future iterations of this metric will involve soliciting complete project lists from all business line representatives to guarantee accuracy.

Appendix B: ORA Metrics Developed Outside of USACE

1. TNC Priority Conservation Areas.

Data Source:
http://www.landscope.org/map_descriptions/conservation_priorities/tnc_priority_conservation_areas/18034/

Meta Data:
http://www.conservationgateway.org/ConservationPlanning/SettingPriorities/EcoregionalReports/Pages/EastData.aspx

The Nature Conservancy (TNC) developed a spatial layer of priority conservations across all 50 US states, which was last updated in 2011. TNC defines priority conservation areas within each of their defined ecoregions (terrestrial and aquatic) across the country. Priority areas were identified based on a number of criteria including species diversity and distribution, habitat quality, threats, etc. at both the regional and national level. Detailed reports on each ecoregion and their contained priority areas are available below. These reports can be used at the project level to gather detailed information on priority areas that fall on their projects including target species and habitats, threats, and conservations strategies.

Detailed Ecoregion Reports:
http://www.conservationgateway.org/ConservationPlanning/SettingPriorities/EcoregionalReports/Pages/EastData.aspx

Methods used to identify TNC Priority Areas overlapping with NRM projects are outlined in the table below. Only project land area was included in this analysis (i.e., water area is excluded) as we are only concerned with terrestrial priority areas for this effort.

#	ANALYSIS STEP	Created File Name	Notes
1	Project habitat layers to 'USA_Contiguous_Albers_Equal_Area_Conic_USGS_version' (meters), GCS_North_American_1983 (degrees)	TNC Areas project.shp	---
2	Remove water area ('WaterFeature_A_Natural_Resource_Management.shp') from NRM project boundaries (ProjectReferenceArea_A_Natural_Resource_Management.shp)	NRM_project_no_water.shp	---

| 3	Intersect 'TNC_Areas_project.shp' with 'NRM_project_no_water.shp'	NRM_TNC_intersect.shp	Overlapping areas tied to multiple TNC 'Ecoregions' which helpful in understanding importance, causes double counting of areas. Must do dissolve to get just total area of TNC priority areas overlapping with NRM project lands
4	Dissolve 'NRM_TNC_intersect' on just projects to get total overlapping areas	NRM_TNC_intersect_dis3.shp	---
5	Export 'NRM_TNC_intersect_dis3.shp' and 'NRM_TNC_intersect.shp' into excel and compute $ of each NRM project overlapping with TNC Priority areas	NRM_habitats.xlsx (worksheet 'NRM_project_no_water')	Final values to indicate % of area of each project overlapping important habitat areas for priority species (as defined by TNC ecoregion analysis)
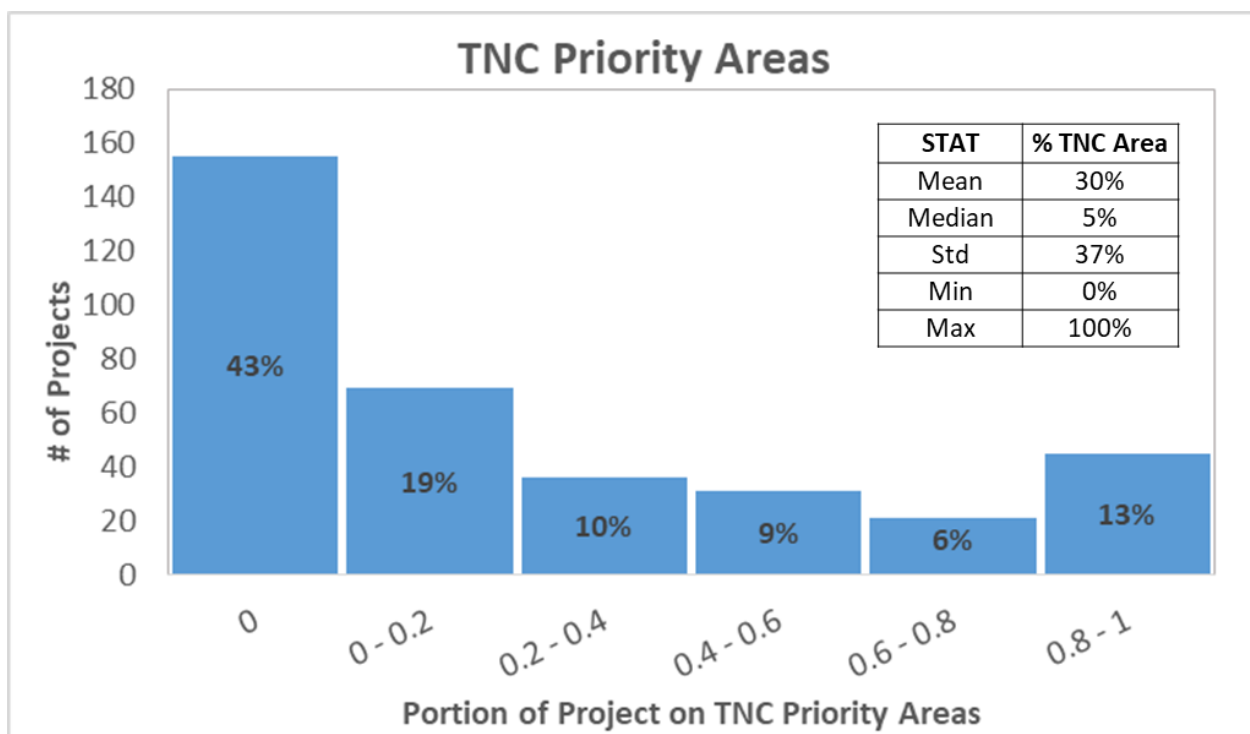
Figure 5. Resulting distribution across NRM projects of portion of land area overlapping TNC priority areas (% in bars show % of projects in bin). A majority (43% of projects had non TNC priority areas on their lands while 13% of projects are comprised of 80% or more of TNC priority areas.

Note: A portion of ENS projects do not have spatial data delineating project boundaries and reservoirs. Out of 430 projects, 384 had sufficient boundary spatial data and 358 had reservoir data available to perform the analysis with the TNC data. All projects with boundary data have been anlayzed, and final TNC area percentages for projects with no water utilize total project area (with water) in computation.

2. Percent Connectivity Matrix (MSPA).

Data Source:
https://edg.epa.gov/data/public/ORD/EnviroAtlas/

Meta Data:
https://forest.jrc.ec.europa.eu/en/activities/lpa/mspa/

The MSPA (Morphological Spatial Pattern Analysis) raster layer categorizes NLCD 2011 land cover into foreground and background classes. The foreground class is broken down by a number of subclasses like core (habitat/natural areas), edges around core areas, bridges linking core areas, etc. Similarly, the background class is broken down into core and edge subclasses (see Figure 6). Background classes are defined as all developed and water NLCD land cover classes. Foreground classes are defined as all non-developed (and non-water) NLCD 2011 land cover classes (see Table 4). The purpose of this MSPA layer is to identify natural corridors (i.e., contiguous areas of habitat) for conservation prioritization. These corridors are identified as the Foreground classes. Methods of computing the percent of MSPA corridors overlapping NRM lands are outlined in Table 5.
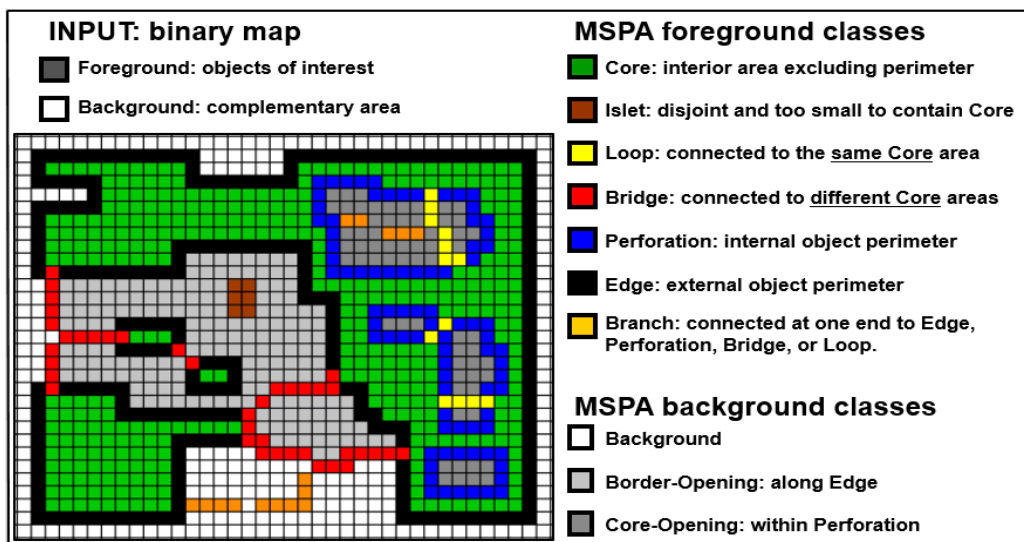

Figure 6. Key to MSPA (Morphological Spatial Pattern Analysis) grid cell classes. All grid cells with foreground classes (i.e., those with NLCD 2011non-developed and non-water land cover classes) overlapping NRM projects were summed to estimate a total 'MSPA habitat area' for each project.

Table 4. MSPA Classes as they correspond to NLCD 2011 land cover classes

NLCD Land Cover Class	MSPA Class
Unclassified	Background
Open Water	Background
Perennial Snow/Ice	---
Developed, Open Space	Background
Developed, Low Intensity	Background

Developed, Medium Intensity	Background
Developed, High Intensity	Background
Barren Land	Background
Deciduous Forest	Foreground
Evergreen Forest	Foreground
Mixed Forest	Foreground
Shrub/Scrub	Foreground
Herbaceous	Foreground
Hay/Pasture	Background
Cultivated Crops	Background
Woody Wetlands	Foreground
Emergent Herbaceous Wetlands	Foreground

Table 5. MSPA methods

#	ANALYSIS STEP	Created File Name	Notes
1	Create 'NRM_project_no_water.shp' layer by using the 'Overlay' tool in ArcGIS to remove the water area from total NRM project areas (for all projects with available data)	NRM_project_no_water.shp	
2	Use 'Tablulate Area' tool to compute the total area of each MSPA cell type (e.g., corridor, interior, etc.) within each NRM projct boundary. Export resulting table to .csv format	TNC_Areas_project.shp	MSPA2011_no_water.csv
3	Copy 'MSPA2011_no_water' table into excel (shown in tab 'MSPA2011WB_variables')	MSPA2011WB_Project.xlsx	Current file
4	Compute total 'Corridor' area (acres) within each NRM project boundary by summing all MSPA cell types (excluding 'Background' which represents both water and developed areas)	TOTAL CORRIDOR AREA (ac)	Result shown in column X in tab 'MSPA2011WB_variables'
5	Compute total % of land portion of each NRM project comprised of MSPA corridors (AREA_CORRIDOR)/(LAND_PROJECT_AREA)	**% TOTAL AREA (excluding water) corridors**	Final values for indicators of % of project land area comprised of ecologically important corridors (shown in column AB of tab 'MSPA2011WB_variables')

Note: A portion of ENS projects do not have spatial data delineating project boundaries and reservoirs. Out of 430 projects, 384 had sufficient boundary spatial data and 358 had reservoir data available to perform the analysis with the MSPA data. All projects with boundary data have been anlayzed, and final MSPA percentages for projects with no water utilize total project area (with water) in computation.

MSPA Corridors

STAT	Portion of Project that is Corridor
Mean	0.69
Median	0.77
Std	0.26
Min	0.00
Max	1.00

Bars (Portion of Project that is Corridor): 0 → 0%; 0 - 0.1 → 4%; 0.1 - 0.2 → 3%; 0.2 - 0.3 → 4%; 0.3 - 0.4 → 3%; 0.4 - 0.5 → 6%; 0.5 - 0.6 → 8%; 0.6 - 0.7 → 12%; 0.7 - 0.8 → 16%; 0.8 - 0.9 → 25%; 0.9 - 1 → 18%
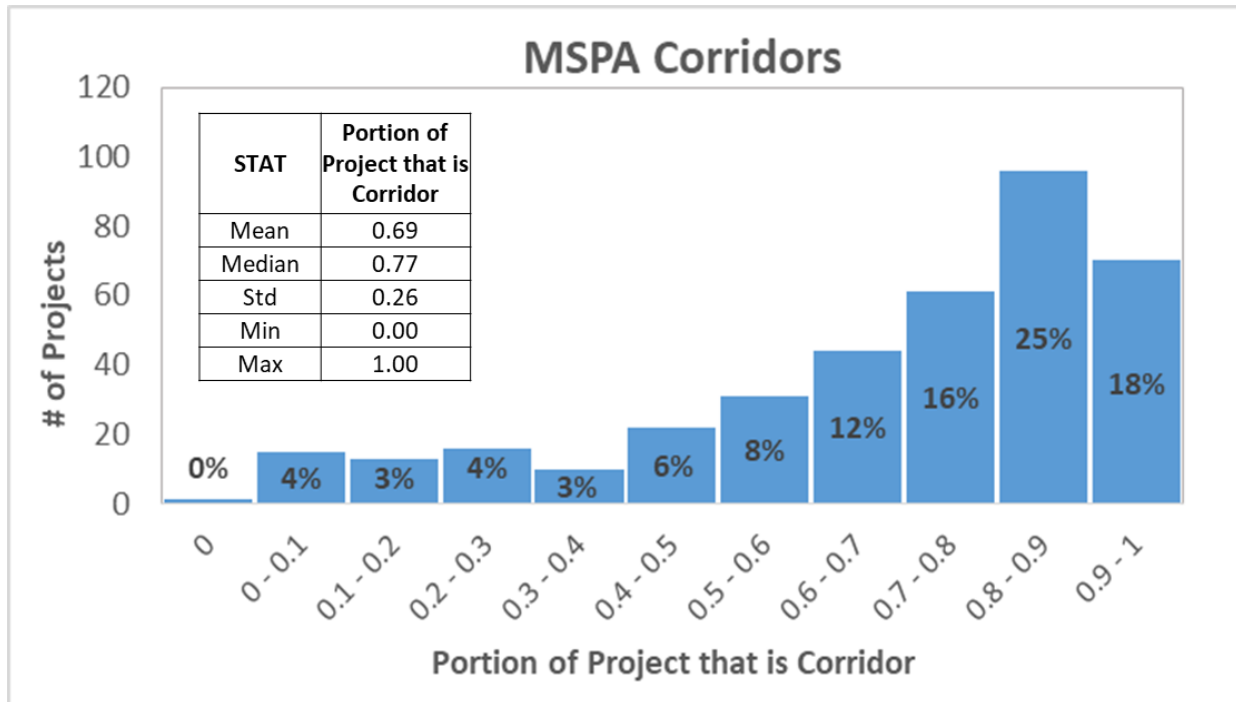
Figure 7. Histogram of the proportion of project land covered by MSPA corridors across all NRM projects. (% in bars show % of projects in bin). Distribution is skewed toward larger proportions of MSPAs corridors – at total of 43% of NRM projects are comprised of lands made up of over 80% MSPA corridors.

Appendix C: Acronyms

AM – Asset Management
DOR – Database of Record
EDW – Enterprise Data Warehouse
ENS – Environmental Stewardship
EPA – Environmental Protection Agency
MSPA – Morphological Spatial Pattern Analysis
NLCD – National Land Cover Database
NRM – Natural Resource Management
NSI – National Structure Inventory
OCA – Operational Condition Assessment
ORA – Operational Risk Assessment
PLSS – Public Land Survey System
REMIS – Real Estate Management Information System
TNC – The Nature Conservancy
USMART – USACE Survey Monument Archival & Retrieval Tool
WCC – Work Category Code