

Florida Everglades 2005-6 Survey Design

Contact:

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Description of Sample Design

Target population: Florida Everglades public freshwater marsh flow-way.

Sample Frame: Sample frame provided by Don Norris, EPA Region 4, Athens. Shapefile named "Newstudy".

Survey Design: A Generalized Random Tessellation Stratified (GRTS) survey design for an area resource was used. The GRTS design includes reverse hierarchical ordering of the selected sites.

Multi-density categories: None. Equal probability sample within each stratum.

Stratification: Stratify by each of the four areas: Loxahatchee, WCA-2, WCA-3, and Everglades National Park

Panels: Two: Spring and Fall. One for Dry season and one for wet season

Expected sample size: Expected sample size 125 sites for each panel. 25 sites for Loxahatchee and WCA-2; 38 sites for WCA-3; 37 sites for Everglades National Park.

Over sample: 250 sites.

Site Use: The base design has 125 sites per panel. Sites are listed in SiteID order and must be used in that order. All sites that occur prior to the last site used must have been evaluated for use and then either sampled or reason documented why that site was not used. As an example, if 60 sites are to be sampled and it required that 75 sites be evaluated in order to locate 60 sampleable sites, then the first 75 sites in SiteID order would be used. This may be done within each stratum.

Sample Frame Summary

Based on the areas in the newstudy shapefile, the total area of the Everglades study region is 5280.516 sq km. These areas may be needed to adjust the weights when the design is not implemented as planned. Area by strata are:

568.842224 LOX
 540.291290 WCA2A
 2377.668829 WCA3A
 1793.714015 ENP

Site Selection Summary

Number of sites

	Fall	OverSamp	Spring	Sum
ENP	37	74	37	148
WCA3A	38	76	38	152
WCA2A	25	50	25	100
LOX	25	50	25	100
Sum	125	250	125	500

Description of Sample Design Output:

A tab-delimited ASCII file (can be directly read into Excel) was produced with the following variable definitions:

Variable Name	Description
SiteID	Unique site identification (character)
x	x-coordinate from map projection (see below)
y	y-coordinate from map projection (see below)
mdcaty	Multi-density categories used for unequal probability selection
weight	Weight (in square meters), inverse of inclusion probability, to be used in statistical analyses
stratum	Strata used in the survey design
panel	Identifies base sample by panel name and Oversample by OverSamp
EvalStatus	Site evaluation decision for site: TS: target and sampled, LD: landowner denied access, etc (see below)
EvalReason	Site evaluation text comment
auxiliary variables	Remaining columns are from the sample frame provided

Projection Information

```
PROJCS["NAD_1927_UTM_Zone_17N",
GEOGCS["GCS_North_American_1927",
DATUM["D_North_American_1927",
SPHEROID["Clarke_1866",6378206.4,294.9786982]],
PRIMEM["Greenwich",0.0],
UNIT["Degree",0.0174532925199433]],
PROJECTION["Transverse_Mercator"],
PARAMETER["False_Easting",500000.0],
PARAMETER["False_Northing",0.0],
PARAMETER["Central_Meridian",-81.0],
PARAMETER["Scale_Factor",0.9996],
PARAMETER["Latitude_Of_Origin",0.0],
UNIT["Meter",1.0]]
```

Evaluation Process

The survey design weights that are given in the design file assume that the survey design is implemented as designed. Typically, users prefer to replace sites that can not be sampled with other sites to achieve the sample size planned. The site replacement process is described above. When sites are replaced, the survey design weights are no longer correct and must be adjusted. The weight adjustment requires knowing what happened to each site in the base design and the over sample sites. EvalStatus is initially set to "NotEval" to indicate that the site has yet to be evaluated for sampling. When a site is evaluated for sampling, then the EvalStatus for the site must be changed. Recommended codes are:

EvalStatus Code	Name	Meaning
TS	Target Sampled	site is a member of the target population and was sampled
LD	Landowner Denial	landowner denied access to the site
PB	Physical Barrier	physical barrier prevented access to the site
NT	Non-Target	site is not a member of the target population
NN	Not Needed	site is a member of the over sample and was not evaluated for sampling
Other codes		Many times useful to have other codes. For example, rather than use NT, may use specific codes indicating why the site was non-target.

Statistical Analysis

Any statistical analysis of data must incorporate information about the monitoring survey design. In particular, when estimates of characteristics for the entire target population are computed, the statistical analysis must account for any stratification or unequal probability selection in the design. Procedures for doing this are available from the Aquatic Resource Monitoring web page given in the bibliography. A statistical analysis

library of functions is available from the web page to do common population estimates in the statistical software environment R.

For further information, contact

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Bibliography:

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Web Page: <http://www.epa.gov/nheerl/arm>

Addendum

The coordinates of the sites that were actually sampled (i.e., stations), given in the data file accompanying the report, were obtained on-station, at the centroid of three soil sub-sampling points, using a real-time differentially correcting GPS, capable of averaging multiple position fixes, with post-processing if real-time differential signals were unavailable. The reference datum was geographic NAD-83.