

Reconnaissance Survey Protocol Port Everglades Navigation Improvements Project

March 2017

**(Developed at the Interagency Working Group (IWG) meeting October 4, 2016,
Amended per IWG conference call January 18, 2017 and per draft review on
February 1, 2017)**

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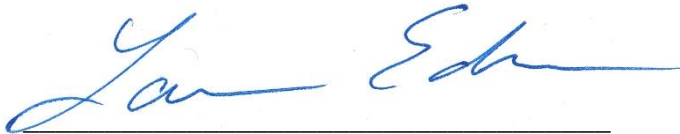
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The following signatories agree to the contents of this document, Reconnaissance Survey Protocol for the Port Everglades Navigation Improvements Project. This Survey is based on the best available information as of the date of this document as well as budget and schedule considerations. The action area as defined by the purple line on Figure 1 will be reevaluated if additional information is received at a later date which shows a change in the expected extent of potential indirect impacts.

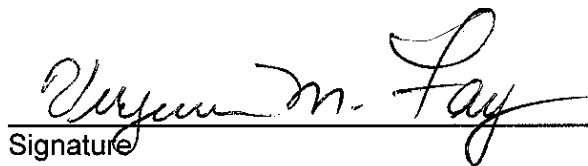


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Reconnaissance Survey Protocol for Port Everglades Navigation Improvements Project

The following reconnaissance survey protocol for the Port Everglades Navigation Improvements Project (PENIP) reflects the methods described and discussed at the Interagency Working Group (IWG) meeting held on October 4, 2016 at Loxahatchee National Wildlife Refuge, Boynton Beach, Florida. This protocol was further amended per comments received during a follow up IWG teleconference on January 18, 2017, and further revised on February 1, 2017, as part of the draft review.

1.0 RECONNAISSANCE SURVEY GOAL

The goal of the Port Everglades reconnaissance survey is to obtain information on natural communities for project planning and Florida Department of Environmental Protection (FDEP) state permitting within 150 meters (m) of the existing Port Everglades entrance channel. The area within 150 m of the entrance channel (also known as the “mixing zone”) was identified through the National Environmental Policy Act (NEPA) process by the Army Corps of Engineers (USACE) to be the area of direct and indirect impact predicted to occur due to the deepening and widening of the Outer Entrance Channel (OEC) (USACE 2015).

2.0 RECONNAISSANCE SURVEY OBJECTIVES

The specific objectives of the reconnaissance survey are to obtain information to determine the following:

- a) Amount of compensatory mitigation required to offset impacts
 - i) Uniform Mitigation Assessment Method (UMAM) (62-345, Florida Administrative Code (F.A.C.))
 - ii) Current condition of resources (373.414(1)(a)(7), and 373.414(18), Florida Statute (F.S.))
- b) Mitigation Plan (373.414, F.S.)
 - i) Establish a reference dataset to set success criteria
 - ii) Determine appropriate enhancement activities (e.g., nurseries and out-planting).
- c) Impact Minimization (Environmental Resource Permit (ERP) Applicant’s Handbook, Vol. 1, 10.2.1)
 - i) Distribution and abundance of benthic organisms (not limited to corals)
 - ii) Plan for relocation of benthic organisms out of the predicted impact area
- d) Provide data outside of the 150 m mixing zone to characterize habitats more distant from the channel for consultation with National Marine Fisheries Service (NMFS) and NEPA determinations, including Essential Fish Habitat (EFH).
- e) Document any seagrasses that are present along transects.
- f) Inform the design of future surveys, including pre-construction, construction, and post-construction.

3.0 SPATIAL EXTENT OF RECONNAISSANCE SURVEY

The spatial extent of the reconnaissance survey area includes the predicted direct impact area (area of the dredging footprint) and the 150 m indirect impact area (mixing zone) both north and south of the channel, for which USACE agreed in the final EIS to provide up front mitigation. This area covers potential dredge and dredge support vessel anchoring areas outside of the dredge footprint. Additional survey areas outside of the mixing zone have also been added within the Endangered Species Act (ESA) study area boundary as requested by NMFS for EFH consultation purposes. For multiple purposes, including EFH and ESA, an area larger than the mixing zone is being evaluated for potential project-related sedimentation (Figure 1, purple line) and assist in

characterizing this area for the EFH consultation, 25 additional transects have been added to this survey protocol.

For the resources within the direct impact areas and downslope areas that will not be surveyed due to concerns regarding diver safety, the data collected within the adjacent habitat type will be used to estimate current condition. The outer reef direct impact area will be evaluated using data collected only from the northern side of the channel.

Benthic resource data from other sources will be reviewed, discussed, compared and contrasted with data collected from this survey and will be included within the report.

4.0 RECONNAISSANCE SURVEY ASSESSMENT AREAS

Reconnaissance survey areas will be conducted by habitat type, using the Walker and Klug 2014 data set. Within the mixing zone there are eight (8) habitat types north and nine (9) habitat types to the south of the channel that will be surveyed. Habitat types on the north side to be surveyed in order from west to east include: artificial, colonized pavement shallow; linear reef inner, linear reef middle, colonized pavement deep, linear reef outer, spur and groove, aggregated patch reef deep. Habitat types on the south side include: ridge shallow, colonized pavement shallow, artificial, linear reef inner, linear reef middle, colonized pavement deep, linear reef outer, spur and groove, and aggregated patch reef deep. The eastern most habitat type, outer ridge deep, will not be surveyed using this protocol.

5.0 SURVEY METHODS

Reconnaissance survey methods will employ *in situ* data collection methods along temporary transects by qualified scientific divers. Scientific divers completing in-water survey work and staff tasked with data management and analysis shall be qualified biologists and shall meet at least the following minimum requirements:

- 1) Bachelor of Science in Marine Biology, Biology with a concentration in marine sciences, Environmental Science with a minor in Biology, or similar degree;
- 2) Documented experience monitoring hardbottom / coral reef communities;
- 3) Scientific knowledge of marine benthic ecosystems and organisms, including but not limited to scleractinian corals, octocorals, sponges and algae.

Video will be recorded along each transect at a rate of five (5) m per minute. Video will also include a panoramic video of the landscape at the beginning and end of each transect. Representative photographs including landscape views and substrate types will be collected for all sites. See Figure 1 for graphic display of proposed sampling transect locations and see Appendix A for transect coordinates.

Each transect will be 30 m long. Along each transect a 1 meter wide belt survey (30 m²) will be conducted on the right side of the transect tape. On the left side of the transect tape quadrat data will be collected within seven (7) 0.5 m² quadrats (located at the transect ends and every 5 m in between), for a total area of 3.5 m² quadrat data per transect.

In each habitat type to the north and south of the channel and within the mixing zone, 10 transects will be sampled for a sub-total of 170 transects (Figure 1 and Table 1). Transects have been randomly stratified in each habitat type within a buffered area. In ArcView GIS a 10 m buffer area was established for each habitat type, so that no transect would be closer to a habitat boundary than 10 m, including a transition from reef to sand. Also, a 10 m boundary was applied to transects, so that no transects touch or overlap each other. An additional 25 transects will be placed outside of the mixing zone to provide additional information for EFH consultation (Table 2). A result a total of 195 transects will be surveyed under this protocol (Figure 1). Based upon bathymetry data, the 195 proposed transects are in depths from 11-86 feet. There are 65 transects in 11-29 feet, 85 transects in 30-59 feet, and 45 transects in 60-86 feet. The same methods will be used for all 195 transects and the results for all transects will be included in the reconnaissance survey report. Planned GPS points for all transect

origins and ends are provided in Appendix A. Actual coordinates will be provided in the report.

Table 1 Port Everglades reconnaissance survey sampling design for transects within 150 m mixing zone.

	Port Everglades Reconnaissance Survey Plan
Number of transects	170
Number of quadrats per transect	7
Area per quadrat (m ²)	0.5
Area sampled in quadrats per transect (m ²)	3.5
Area sampled in belt per transect (m ²)	30
Total area sampled in quads (m ²)	595
Total area sampled in belt (m ²)	5,100
Acres of reef within mixing zone	130.6
Reef (m ²) area within mixing zone*	528,644.9
% of area sampled with quads	0.11
% of area sampled with belt	0.96

*** For the deep ridge habitat type, data from previous surveys will be reviewed and synthesized into the report.**

Table 2 Port Everglades reconnaissance survey sampling design that will be used to help characterize the reef habitats more distant from the channel

	Port Everglades Reconnaissance Survey Plan - EFH
Number of transects	25
Number of quadrats per transect	7
Area per quadrat (m ²)	0.5
Area sampled in quadrats per transect (m ²)	3.5
Area sampled in belt per transect (m ²)	30
Total area sampled in quads (m ²)	87.5
Total area sampled in belt (m ²)	750
Acres of reef within 1050x1020m	695.5
Reef (m ²) area within 1050x1020m*	2,814,783
% of area sampled with quads	0.003
% of area sampled with belt	0.027

*** For the deep ridge habitat type, data from previous surveys will be reviewed and synthesized into the report.**

5.1 Transect Data Collection

The following data will be collected along each transect line:

1. Digital video will be collected 50 cm above the bottom. No analysis of the video is required under the reconnaissance survey. It should be noted that small organisms (<3 cm) from this height may not be identifiable to species. Video will be acquired at a rate of 5 m per minute to provide video that may be analyzed using Point Count, but this analysis will not be completed under this plan. A camera without distortion (i.e., without a fish-eye lens) will preferentially be used to collect video. Cameras with fish-eye lens (e.g., GoPro cameras) will not be used to collect video, except as a back-up if the primary camera fails. Any videos collected with a GoPro or other camera not suitable for quantitative analysis will be recorded in the field notes and provided in the final report.

- Physical features, including sand patches and substrate type along the transect, will be noted. Soft substrate categories will include coarse sand, fine sand (mud-like), and mixed (coarse and fine) sand. Soft substrates will be characterized visually and tactilely. Additional categories, after consultation with the IWG, may be added when encountered.

The following data will be collected from within the belt transect:

- Coral identification to species, maximum dimension measured, and counted.
- Xestospongia muta* counts by size classes (to 0-10 cm, 10.1 – 25 cm, 25.1 – 50 cm, >50 cm).

The following data will be collected from within each quadrat:

- Percent cover by functional groups (simplified Benthic Ecological Assessment for Marginal Reefs) (BEAMR) (Makowski et al. 2009). See Table 3 for a list of functional groups.
- Octocorals will be identified to genus, maximum dimension measured, and counted.
- Sponges will be identified by morphotype (i.e., encrusting, erect branching, tube / vase, massive / amorphous, and spherical) and counted by size class to 0-10 cm, 10.1 – 25 cm, 25.1 – 50 cm, >50 cm.).

Draft data sheets for the quadrat data and belt transect data are included as Figure 2. These may be updated and will be finalized with concurrence from agencies before field work is initiated.

Table 3 Functional group data to be collected within reconnaissance survey quadrats.

Functional Groups to be Used (N=14):
Sediment (by type: fine, coarse, mixed)
Bare substratum
Seagrasses
Macroalgae (by Family)
Turf algae
CCA
Cyanobacteria
Sponges
Corals
Octocorals
Zoanthids
Hydrocorals
Sessile worms
“Other invertebrates”
“Other Invertebrates” includes:
-Anemones
-Bivalves
-Barnacles
-Bryozoans
-Tunicates

6.0 QUALITY CONTROL/QUALITY ASSURANCE

Quality control and quality assurance (QA/QC) are ongoing processes with checks and balances to ensure consistent, accurate and precise data collection, entry, and analysis. Quality control begins with scientific diver training and calibration exercises, before actual data collection commences. Scientific divers will spend up to three (3) full field days training, collecting data, comparing results and discussing differences in order to reduce inter-observer variability (to attain 10% or less). Divers will be cross trained across tasks. Agency staff are invited to participate in part or all of the field days, including days devoted to QA/QC activities.

During data collection, all scientific divers will check their own field datasheets after a dive to ensure completeness, legibility, and accuracy. Once field data sheets are

cleaned and dried at the office, if any changes to data sheets need to be made, the changes will be made by a single strikethrough of the original entry, and the new entry made with a colored marker initialed and dated. Changes will only be made by the original data collector, and an explanation for changes will be provided. After any changes to the data sheet are finalized, data will be entered into a project specific Excel spreadsheet. A staff member (other than the person who entered the data) will QA/QC the entered spreadsheet data against the original data sheet (or a photocopy) to ensure the correct transfer of the data. Once data is entered and QA'd both the original data collector and person conducting the QA should sign and date the data sheet to confirm that the data has been validated and finalized. Data sheets will be electronically scanned for the record. All photographs and video will be filed by transect on a routine basis.

7.0 REPORTING

Data deliverables will include digital photo and video files named with transect information, sorted by assessment area, copies of field datasheets (if requested by agencies), and Excel spreadsheets with complete and accurate data.

A narrative report will be written and provided with descriptive statistics (mean and standard deviation presented in tabular format), which shall be summarized by transect, assessment area, habitat type, and reef zone. Excel spreadsheets for all statistics within the report shall also be provided. The report will include a qualitative description of assessment areas, a list of taxa observed, and any notable physical features.

All data (*in situ* (actual) transect coordinates, photo and video files, scanned data sheets, and Excel spreadsheets – raw data) will be available within 30 days after all field data collection is completed. Data will be submitted to Port Everglades and the USACE. Once data have been reviewed by the Port and Corps, it will be made available to the IWG. A draft report will be provided to Port Everglades and the USACE within 90 days after field data collection is completed. Once the report is acceptable to the Port and USACE, it will be sent to agencies for review. A final report will be submitted within 10 days of receiving comments from all agencies.

8.0 LITERATURE CITED

Makowski, C., Prekel, S.E., Lybolt, M.J., Baron, R. M. 2009. The Benthic Ecological Assessment for marginal reefs (BEAMR) Method. *Journal of Coastal Research*. Vol. 25 Issue 2. 515-522.

NSUOC. 2011. Benthic Habitat Characterization for the South Florida Ocean Measurement Facility (SFOMF) Protected Stony Coral Species Assessment. Prepared for Seaward Services. 54 pages.

USACE (United States Army Corps of Engineers). 2015. Final Feasibility Report and Environmental Impact Statement: Port Everglades Harbor Navigation Study. Broward County, FL. pp. 44, 99-100, 109, 111, 115.

Walker, B.K. and Klug, K. 2014. Southeast Florida Shallow-Water Habitat Mapping & Coral Reef Community Characterization. Florida DEP Coral Reef Conservation Program report : 1 -71. http://nsuworks.nova.edu/occ_facreports/87.

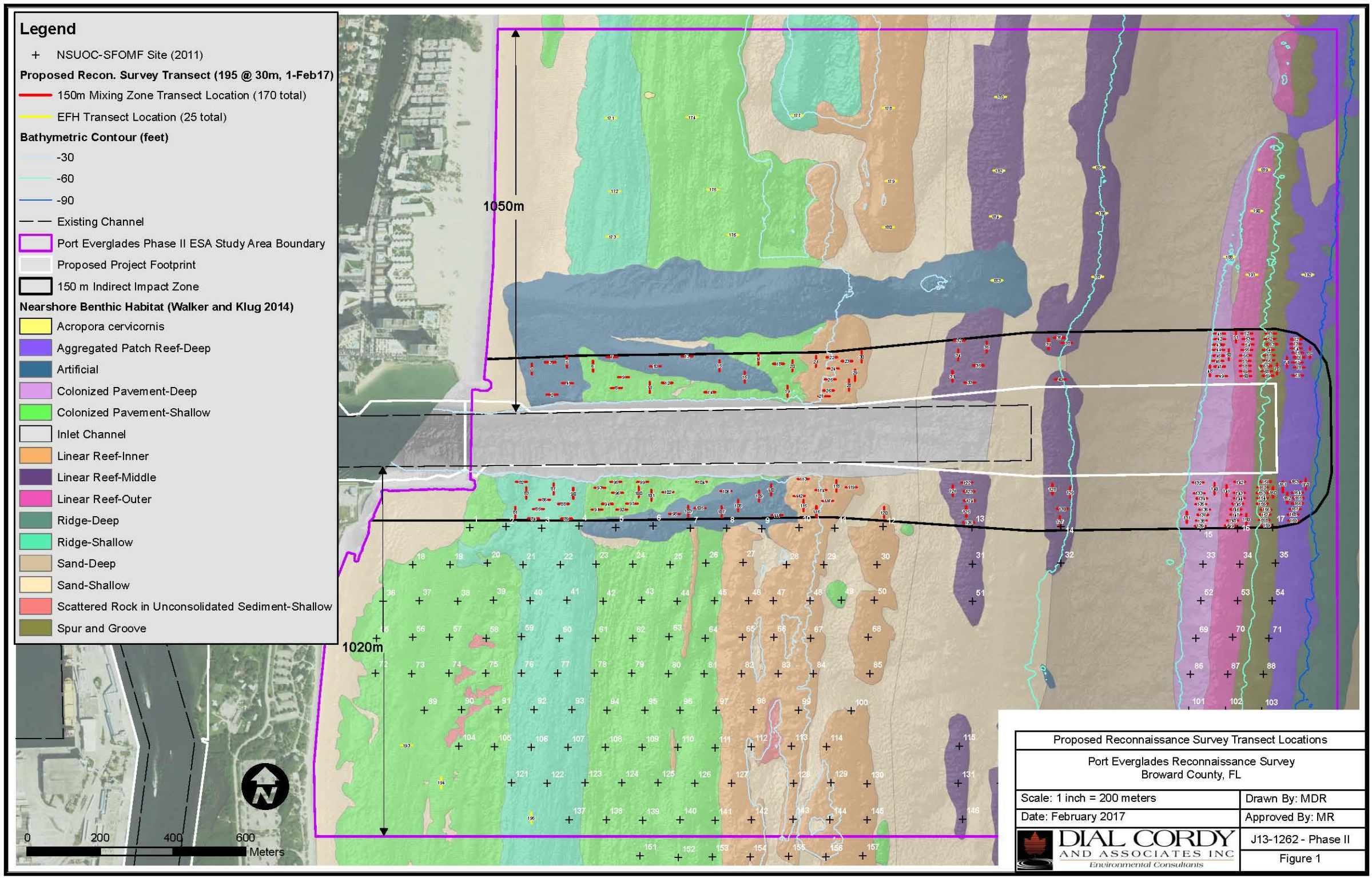


Figure 1. Proposed Reconnaissance Survey Transect Locations

Project Name: PE Site Name / Transect Name: Practice T1/T2 Time: 12:30/1:45 Vis: 25/25

Date: 2/17/17 Data Collector: LP Depth: 30/33 Temp: 75/75

Habitat Transition Line: 0m to 30m (sand patch 24.8)

Habitat Transition Line: 0m to 30m (sand patch 4.3, 8.2)

Transect 1				Transect 2			
Count	Coral Species	Maximum Dimension (cm)	Count	Count	Coral Species	Maximum Dimension (cm)	Count
1	PAST	3	31	1	MCAV	43.2	31
2	SSID	6	32	2	ORAD	7.1	32
3	SSID	7	33	3	SSID	6.2	33
4	MCAV	34	34	4	PAST	10.8	34
5	MCAV	41	35	5	PAST	11	35
6	PAST	10.4	36	6			36
7	PAST	11.2	37	7			37
8			38	8			38
9			39	9			39
10			40	10			40
11			41	11			41
12			42	12			42
13			43	13			43
14			44	14			44
15			45	15			45
16			46	16			46
17			47	17			47
18			48	18			48
19			49	19			49
20			50	20			50
21			51	21			51
22			52	22			52
23			53	23			53
24			54	24			54
25			55	25			55
26			56	26			56
27			57	27			57
28			58	28			58
29			59	29			59
30			60	30			60

Transect 1		Transect 2	
Size Class (cm)	Count	Size Class (cm)	Count
0-10		0-10	
10.1-25		10.1-25	
25.1-50		25.1-50	
>50		>50	

Notes - Optional (eg: lobster trap, fishing line):

Project Name: PE Site Name / Transect Name: Practice Quad 1 Time: 7:10 Vis: 25 Depth: 33

Date: 2/17/17 Data Collector: LP

Quad Label: 1 Sample Name or #

Sample Name or #	Max Field (cm)	Max Sediment Depth (cm)	Sediment Bedrock % Cover	Fine Sediment (sand size)	Sandy Sediment (coarse)	Mixed Sediment (fine + sandy)	Bare Substratum	Seagrass	Macroalgae Family (code at g, h, i)	Turf Algae	Calcareous Crustose Algae	Cyanobacteria	Sponges	Corals	Octocorals	Zoanthids	Hydrozoans	Sessile Vermet	Other
1	4.1	6.2	30	30	5	5	5	0	5	5	0	0	10	0	5	10	0	0	5

Species	Count	Max Dimension (cm)
Sponge Monophytes		0-10
Branching/Erect		10.1-25
Tubular/Tube		25.1-50
Encrusting		>50
Ancipitous/Massive		
Ball		
Octocoral Genus		
Eumelia	29, 33, 41, 21, 19, 23, 28, 40	
Erythropodium	4, 5, 8, 7, 8, 9	
Gorgonia		
Balanus		
Plexaura	12, 19, 31, 37	
Rhizaria		
Pseudopteraster		
Muricea		
Pteropoda		
Anthiporia	50, 52	
Muriceopsis		

Total Area = 100%

Figure 2. Draft modified BEAMR (quadrat) and belt transect data sheet for Port Everglades reconnaissance protocol.

Appendix A – Planned Reconnaissance Transect Locations

TRANSECT_ID	START_END	EASTING_X	NORTHING_Y	LONGITUDE	LATITUDE
1	START	950419.8	641428.0	-80.10341	26.09554
1	END	950419.8	641329.4	-80.10341	26.09527
2	START	950550.7	641147.8	-80.10302	26.09477
2	END	950649.2	641147.8	-80.10272	26.09476
3	START	950535.4	641440.3	-80.10306	26.09557
3	END	950633.9	641440.3	-80.10276	26.09557
4	START	950691.8	641251.6	-80.10259	26.09505
4	END	950790.3	641251.6	-80.10229	26.09505
5	START	950734.5	641491.7	-80.10245	26.09571
5	END	950734.5	641393.2	-80.10245	26.09544
6	START	950968.6	641453.2	-80.10174	26.09560
6	END	950968.6	641354.7	-80.10174	26.09533
7	START	951089.9	641486.3	-80.10137	26.09569
7	END	951188.4	641486.3	-80.10107	26.09569
8	START	951131.3	641207.7	-80.10125	26.09492
8	END	951229.8	641207.7	-80.10095	26.09492
9	START	951193.5	641307.1	-80.10106	26.09519
9	END	951292.0	641307.1	-80.10076	26.09519
10	START	951480.0	641403.4	-80.10018	26.09545
10	END	951578.5	641403.4	-80.09988	26.09545
11	START	951478.5	641263.5	-80.10019	26.09507
11	END	951478.5	641164.9	-80.10019	26.09480
12	START	951587.7	641253.3	-80.09986	26.09504
12	END	951686.2	641253.3	-80.09956	26.09504
13	START	951765.8	641492.8	-80.09931	26.09569
13	END	951864.3	641492.8	-80.09901	26.09569
14	START	951971.3	641170.9	-80.09869	26.09480
14	END	952069.8	641170.9	-80.09839	26.09480
15	START	952106.0	641457.6	-80.09827	26.09559
15	END	952106.0	641359.1	-80.09828	26.09532
16	START	952333.6	641355.4	-80.09758	26.09530
16	END	952333.6	641256.9	-80.09759	26.09503
17	START	952459.2	641517.7	-80.09720	26.09575
17	END	952459.2	641419.1	-80.09720	26.09548
18	START	952588.6	641425.5	-80.09680	26.09549
18	END	952687.1	641425.5	-80.09650	26.09549
19	START	952718.2	641227.5	-80.09641	26.09494
19	END	952718.2	641128.9	-80.09642	26.09467
20	START	952762.7	641456.5	-80.09627	26.09557
20	END	952762.7	641357.9	-80.09628	26.09530
21	START	952974.9	641495.6	-80.09563	26.09568
21	END	952974.9	641397.0	-80.09563	26.09541
22	START	953068.8	641484.4	-80.09534	26.09564
22	END	953167.3	641484.4	-80.09504	26.09564
23	START	953204.8	641449.7	-80.09493	26.09555
23	END	953303.3	641449.7	-80.09463	26.09554
24	START	953081.3	641382.2	-80.09530	26.09536

TRANSECT_ID	START_END	EASTING_X	NORTHING_Y	LONGITUDE	LATITUDE
24	END	953179.8	641382.2	-80.09500	26.09536
25	START	953054.3	641284.8	-80.09539	26.09510
25	END	953152.8	641284.8	-80.09509	26.09509
26	START	953038.9	641185.5	-80.09544	26.09482
26	END	953137.4	641185.5	-80.09514	26.09482
27	START	952998.4	641134.3	-80.09556	26.09468
27	END	953096.9	641134.3	-80.09526	26.09468
28	START	953273.0	641283.4	-80.09472	26.09509
28	END	953273.0	641184.9	-80.09473	26.09482
29	START	953327.0	641372.1	-80.09456	26.09533
29	END	953327.0	641273.6	-80.09456	26.09506
30	START	953386.8	641539.0	-80.09437	26.09579
30	END	953386.8	641440.4	-80.09437	26.09552
31	START	954203.9	641362.6	-80.09188	26.09529
31	END	954203.9	641264.1	-80.09189	26.09502
32	START	954214.1	641633.4	-80.09185	26.09603
32	END	954312.6	641633.4	-80.09155	26.09603
33	START	954309.5	641257.3	-80.09157	26.09500
33	END	954408.0	641257.3	-80.09127	26.09499
34	START	954253.7	641555.0	-80.09173	26.09582
34	END	954253.7	641456.5	-80.09173	26.09555
35	START	954387.3	641410.4	-80.09133	26.09542
35	END	954485.7	641410.4	-80.09103	26.09541
36	START	954510.2	641626.4	-80.09095	26.09601
36	END	954510.2	641527.9	-80.09095	26.09574
37	START	955115.5	641661.4	-80.08910	26.09609
37	END	955214.0	641661.4	-80.08880	26.09609
38	START	955181.2	641612.9	-80.08890	26.09596
38	END	955279.6	641612.9	-80.08860	26.09596
39	START	955067.3	641652.1	-80.08925	26.09607
39	END	955067.3	641553.6	-80.08925	26.09580
40	START	955126.1	641285.3	-80.08908	26.09506
40	END	955224.6	641285.3	-80.08878	26.09506
41	START	956556.1	641696.2	-80.08471	26.09616
41	END	956654.6	641696.2	-80.08441	26.09616
42	START	956558.6	641648.2	-80.08470	26.09603
42	END	956657.1	641648.2	-80.08440	26.09603
43	START	956549.2	641596.4	-80.08473	26.09589
43	END	956647.7	641596.4	-80.08443	26.09588
44	START	956549.2	641550.5	-80.08474	26.09576
44	END	956647.7	641550.5	-80.08444	26.09576
45	START	956547.4	641499.8	-80.08474	26.09562
45	END	956645.9	641499.8	-80.08444	26.09562
46	START	956542.6	641451.0	-80.08476	26.09549
46	END	956641.0	641451.0	-80.08446	26.09548
47	START	956557.4	641401.2	-80.08471	26.09535
47	END	956655.9	641401.2	-80.08441	26.09535
48	START	956519.5	641412.3	-80.08483	26.09538
48	END	956519.5	641313.7	-80.08483	26.09511
49	START	956574.7	641316.0	-80.08466	26.09511
49	END	956673.2	641316.0	-80.08436	26.09511

TRANSECT_ID	START_END	EASTING_X	NORTHING_Y	LONGITUDE	LATITUDE
50	START	956691.4	641556.1	-80.08430	26.09577
50	END	956691.4	641457.6	-80.08430	26.09550
51	START	956755.0	641716.1	-80.08411	26.09621
51	END	956755.0	641617.6	-80.08411	26.09594
52	START	956802.5	641698.4	-80.08396	26.09616
52	END	956900.9	641698.4	-80.08366	26.09616
53	START	956814.1	641649.1	-80.08393	26.09603
53	END	956912.6	641649.1	-80.08363	26.09602
54	START	956811.4	641599.2	-80.08394	26.09589
54	END	956909.9	641599.2	-80.08364	26.09589
55	START	956804.1	641550.9	-80.08396	26.09576
55	END	956902.6	641550.9	-80.08366	26.09575
56	START	956791.2	641500.4	-80.08400	26.09562
56	END	956889.7	641500.4	-80.08370	26.09562
57	START	956786.8	641451.2	-80.08401	26.09548
57	END	956885.3	641451.2	-80.08371	26.09548
58	START	956787.7	641406.5	-80.08401	26.09536
58	END	956886.2	641406.5	-80.08371	26.09536
59	START	956789.1	641358.7	-80.08401	26.09523
59	END	956887.6	641358.7	-80.08371	26.09523
60	START	956794.7	641315.8	-80.08399	26.09511
60	END	956893.2	641315.8	-80.08369	26.09511
61	START	957017.5	641697.7	-80.08331	26.09616
61	END	957116.0	641697.7	-80.08301	26.09615
62	START	957011.6	641650.5	-80.08332	26.09603
62	END	957110.1	641650.5	-80.08302	26.09602
63	START	957029.1	641601.8	-80.08327	26.09589
63	END	957127.6	641601.8	-80.08297	26.09589
64	START	956996.3	641551.5	-80.08337	26.09575
64	END	957094.8	641551.5	-80.08307	26.09575
65	START	957003.3	641503.6	-80.08335	26.09562
65	END	957101.8	641503.6	-80.08305	26.09562
66	START	956999.5	641456.1	-80.08337	26.09549
66	END	957098.0	641456.1	-80.08307	26.09549
67	START	956975.4	641405.5	-80.08344	26.09535
67	END	957073.9	641405.5	-80.08314	26.09535
68	START	956980.8	641358.6	-80.08342	26.09522
68	END	957079.3	641358.6	-80.08312	26.09522
69	START	956993.8	641317.9	-80.08339	26.09511
69	END	957092.3	641317.9	-80.08309	26.09511
70	START	957125.7	641428.4	-80.08298	26.09541
70	END	957125.7	641329.9	-80.08298	26.09514
71	START	957212.4	641489.7	-80.08272	26.09558
71	END	957212.4	641391.2	-80.08272	26.09531
72	START	957248.0	641646.3	-80.08260	26.09601
72	END	957346.5	641646.3	-80.08230	26.09601
73	START	957244.4	641604.9	-80.08262	26.09590
73	END	957342.9	641604.9	-80.08232	26.09589
74	START	957246.4	641564.7	-80.08261	26.09578
74	END	957344.9	641564.7	-80.08231	26.09578
75	START	957259.9	641524.1	-80.08257	26.09567

TRANSECT_ID	START_END	EASTING_X	NORTHING_Y	LONGITUDE	LATITUDE
75	END	957358.4	641524.1	-80.08227	26.09567
76	START	957272.8	641485.0	-80.08253	26.09557
76	END	957371.3	641485.0	-80.08223	26.09556
77	START	957259.7	641437.8	-80.08257	26.09544
77	END	957358.2	641437.8	-80.08227	26.09543
78	START	957273.0	641393.3	-80.08253	26.09531
78	END	957371.5	641393.3	-80.08223	26.09531
79	START	957259.9	641321.2	-80.08258	26.09511
79	END	957358.4	641321.2	-80.08228	26.09511
80	START	957418.7	641573.2	-80.08209	26.09581
80	END	957418.7	641474.6	-80.08209	26.09553
81	START	950270.2	640139.9	-80.10390	26.09200
81	END	950270.2	640041.4	-80.10390	26.09173
82	START	950275.5	640363.5	-80.10387	26.09261
82	END	950374.0	640363.5	-80.10357	26.09261
83	START	950369.2	640313.2	-80.10359	26.09247
83	END	950369.2	640214.7	-80.10359	26.09220
84	START	950384.9	640034.4	-80.10355	26.09171
84	END	950483.4	640034.4	-80.10325	26.09170
85	START	950427.7	640120.7	-80.10342	26.09194
85	END	950526.2	640120.7	-80.10312	26.09194
86	START	950483.7	640203.6	-80.10324	26.09217
86	END	950582.2	640203.6	-80.10294	26.09217
87	START	950615.3	640349.2	-80.10284	26.09257
87	END	950615.3	640250.7	-80.10284	26.09230
88	START	950653.9	640166.8	-80.10273	26.09207
88	END	950752.4	640166.8	-80.10243	26.09206
89	START	950681.2	640033.0	-80.10265	26.09170
89	END	950779.6	640033.0	-80.10235	26.09170
90	START	950790.9	640310.5	-80.10231	26.09246
90	END	950790.9	640212.0	-80.10231	26.09219
91	START	950955.2	640113.8	-80.10181	26.09191
91	END	951053.7	640113.8	-80.10151	26.09191
92	START	951178.9	640113.8	-80.10113	26.09191
92	END	951277.4	640113.8	-80.10083	26.09191
93	START	950979.7	640310.1	-80.10173	26.09245
93	END	951078.2	640310.1	-80.10143	26.09245
94	START	951049.3	640165.3	-80.10152	26.09205
94	END	951147.7	640165.3	-80.10122	26.09205
95	START	951124.3	640361.8	-80.10129	26.09259
95	END	951222.8	640361.8	-80.10099	26.09259
96	START	951140.5	640264.7	-80.10124	26.09233
96	END	951239.0	640264.7	-80.10094	26.09232
97	START	951270.5	640167.7	-80.10085	26.09206
97	END	951368.9	640167.7	-80.10055	26.09205
98	START	951653.5	640075.2	-80.09968	26.09179
98	END	951752.0	640075.2	-80.09938	26.09179
99	START	951365.0	640362.6	-80.10056	26.09259
99	END	951463.5	640362.6	-80.10026	26.09259
100	START	951380.6	640322.3	-80.10051	26.09248
100	END	951380.6	640223.8	-80.10051	26.09221

TRANSECT_ID	START_END	EASTING_X	NORTHING_Y	LONGITUDE	LATITUDE
101	START	951493.7	640292.3	-80.10016	26.09240
101	END	951493.7	640193.7	-80.10017	26.09212
102	START	951595.2	640271.8	-80.09986	26.09234
102	END	951693.7	640271.8	-80.09956	26.09233
103	START	951826.4	640148.7	-80.09915	26.09199
103	END	951826.4	640050.2	-80.09916	26.09172
104	START	951896.1	640363.1	-80.09894	26.09258
104	END	951994.6	640363.1	-80.09864	26.09258
105	START	951882.8	640128.4	-80.09898	26.09194
105	END	951981.3	640128.4	-80.09868	26.09193
106	START	952118.0	640279.1	-80.09826	26.09235
106	END	952216.5	640279.1	-80.09796	26.09235
107	START	952126.1	640144.8	-80.09824	26.09198
107	END	952126.1	640046.3	-80.09824	26.09171
108	START	952275.6	640199.8	-80.09778	26.09213
108	END	952275.6	640101.3	-80.09779	26.09185
109	START	952462.3	640286.8	-80.09721	26.09236
109	END	952462.3	640188.3	-80.09722	26.09209
110	START	952573.2	640341.8	-80.09687	26.09251
110	END	952573.2	640243.2	-80.09688	26.09224
111	START	952574.9	640063.3	-80.09688	26.09174
111	END	952673.4	640063.3	-80.09658	26.09174
112	START	952774.9	640238.1	-80.09626	26.09222
112	END	952873.4	640238.1	-80.09596	26.09222
113	START	952811.4	640389.0	-80.09615	26.09264
113	END	952909.9	640389.0	-80.09585	26.09263
114	START	952969.9	640289.6	-80.09567	26.09236
114	END	953068.4	640289.6	-80.09537	26.09236
115	START	952862.4	640199.3	-80.09600	26.09211
115	END	952862.4	640100.8	-80.09600	26.09184
116	START	952979.1	640146.3	-80.09564	26.09197
116	END	952979.1	640047.8	-80.09564	26.09169
117	START	953031.7	640193.1	-80.09548	26.09209
117	END	953130.2	640193.1	-80.09518	26.09209
118	START	953158.8	640375.5	-80.09509	26.09259
118	END	953158.8	640276.9	-80.09509	26.09232
119	START	953243.5	640316.5	-80.09483	26.09243
119	END	953342.0	640316.5	-80.09453	26.09243
120	START	953587.3	640138.3	-80.09379	26.09193
120	END	953587.3	640039.8	-80.09379	26.09166
121	START	954206.8	640333.1	-80.09190	26.09246
121	END	954206.8	640234.6	-80.09190	26.09218
122	START	954284.0	640358.0	-80.09166	26.09252
122	END	954382.5	640358.0	-80.09136	26.09252
123	START	954302.0	640278.3	-80.09161	26.09230
123	END	954400.5	640278.3	-80.09131	26.09230
124	START	954306.9	640195.0	-80.09160	26.09207
124	END	954405.4	640195.0	-80.09130	26.09207
125	START	954327.0	640146.8	-80.09154	26.09194
125	END	954327.0	640048.3	-80.09154	26.09167
126	START	954299.9	639998.6	-80.09162	26.09153

TRANSECT_ID	START_END	EASTING_X	NORTHING_Y	LONGITUDE	LATITUDE
126	END	954398.3	639998.6	-80.09132	26.09153
127	START	955170.6	640056.3	-80.08897	26.09168
127	END	955170.6	639957.7	-80.08897	26.09140
128	START	955102.5	640347.1	-80.08917	26.09248
128	END	955102.5	640248.5	-80.08917	26.09221
129	START	955261.7	640317.9	-80.08868	26.09239
129	END	955261.7	640219.3	-80.08869	26.09212
130	START	955143.0	640121.8	-80.08905	26.09186
130	END	955241.5	640121.8	-80.08875	26.09185
131	START	956311.7	640094.4	-80.08549	26.09176
131	END	956311.7	639995.9	-80.08549	26.09149
132	START	956362.6	640358.1	-80.08533	26.09248
132	END	956461.1	640358.1	-80.08503	26.09248
133	START	956372.9	640261.5	-80.08530	26.09222
133	END	956471.4	640261.5	-80.08500	26.09221
134	START	956397.7	640214.5	-80.08523	26.09209
134	END	956496.2	640214.5	-80.08493	26.09209
135	START	956389.8	640163.8	-80.08525	26.09195
135	END	956488.3	640163.8	-80.08495	26.09195
136	START	956422.8	640115.0	-80.08515	26.09181
136	END	956521.3	640115.0	-80.08485	26.09181
137	START	956406.6	640067.2	-80.08520	26.09168
137	END	956505.0	640067.2	-80.08490	26.09168
138	START	956393.9	640015.8	-80.08524	26.09154
138	END	956492.4	640015.8	-80.08494	26.09154
139	START	956385.0	639967.4	-80.08527	26.09141
139	END	956483.4	639967.4	-80.08497	26.09141
140	START	956561.2	640351.5	-80.08472	26.09246
140	END	956561.2	640253.0	-80.08473	26.09219
141	START	956671.0	640333.7	-80.08439	26.09241
141	END	956671.0	640235.2	-80.08439	26.09214
142	START	956739.9	640362.6	-80.08418	26.09249
142	END	956838.4	640362.6	-80.08388	26.09249
143	START	956735.1	640265.1	-80.08420	26.09222
143	END	956833.6	640265.1	-80.08390	26.09222
144	START	956735.4	640215.4	-80.08420	26.09208
144	END	956833.9	640215.4	-80.08390	26.09208
145	START	956721.1	640165.8	-80.08424	26.09195
145	END	956819.6	640165.8	-80.08394	26.09195
146	START	956703.4	640116.6	-80.08430	26.09181
146	END	956801.9	640116.6	-80.08400	26.09181
147	START	956703.4	640069.2	-80.08430	26.09168
147	END	956801.9	640069.2	-80.08400	26.09168
148	START	956676.4	640016.9	-80.08438	26.09154
148	END	956774.9	640016.9	-80.08408	26.09154
149	START	956653.4	639969.8	-80.08445	26.09141
149	END	956751.9	639969.8	-80.08415	26.09141
150	START	956847.2	640076.0	-80.08386	26.09170
150	END	956847.2	639977.5	-80.08386	26.09143
151	START	956972.4	640365.7	-80.08347	26.09249
151	END	957070.9	640365.7	-80.08317	26.09249

TRANSECT_ID	START_END	EASTING_X	NORTHING_Y	LONGITUDE	LATITUDE
152	START	956944.6	640314.1	-80.08356	26.09235
152	END	957043.1	640314.1	-80.08326	26.09235
153	START	956940.3	640264.0	-80.08357	26.09221
153	END	957038.8	640264.0	-80.08327	26.09221
154	START	956943.1	640217.6	-80.08356	26.09209
154	END	957041.6	640217.6	-80.08326	26.09208
155	START	956941.8	640166.5	-80.08357	26.09194
155	END	957040.3	640166.5	-80.08327	26.09194
156	START	956975.8	640115.9	-80.08347	26.09180
156	END	957074.3	640115.9	-80.08317	26.09180
157	START	956966.3	640068.5	-80.08350	26.09167
157	END	957064.8	640068.5	-80.08320	26.09167
158	START	956958.5	640018.8	-80.08352	26.09154
158	END	957057.0	640018.8	-80.08322	26.09154
159	START	956981.8	639974.1	-80.08345	26.09141
159	END	957080.3	639974.1	-80.08315	26.09141
160	START	957087.4	640318.4	-80.08312	26.09236
160	END	957087.4	640219.8	-80.08312	26.09209
161	START	957176.7	640367.0	-80.08285	26.09249
161	END	957176.7	640268.5	-80.08285	26.09222
162	START	957216.2	640267.4	-80.08273	26.09222
162	END	957216.2	640168.9	-80.08273	26.09195
163	START	957240.2	640364.8	-80.08266	26.09248
163	END	957338.7	640364.8	-80.08236	26.09248
164	START	957256.2	640267.3	-80.08261	26.09222
164	END	957354.7	640267.3	-80.08231	26.09221
165	START	957265.0	640219.7	-80.08258	26.09208
165	END	957363.5	640219.7	-80.08228	26.09208
166	START	957257.3	640169.5	-80.08261	26.09195
166	END	957355.8	640169.5	-80.08231	26.09194
167	START	957237.1	640118.4	-80.08267	26.09181
167	END	957335.6	640118.4	-80.08237	26.09180
168	START	957217.9	640070.9	-80.08273	26.09168
168	END	957316.3	640070.9	-80.08243	26.09167
169	START	957222.6	640017.2	-80.08272	26.09153
169	END	957321.1	640017.2	-80.08242	26.09153
170	START	957380.0	640392.7	-80.08223	26.09256
170	END	957380.0	640294.1	-80.08223	26.09229
171	START	951078.7	643634.4	-80.10136	26.10160
171	END	951177.2	643634.4	-80.10106	26.10160
172	START	951213.0	642976.9	-80.10096	26.09979
172	END	951114.4	642976.8	-80.10126	26.09979
173	START	951191.5	642569.7	-80.10104	26.09867
173	END	951093.0	642569.9	-80.10134	26.09867
174	START	951811.7	643643.6	-80.09913	26.10161
174	END	951910.2	643643.6	-80.09882	26.10161
175	START	951998.5	642992.8	-80.09857	26.09981
175	END	952097.0	642992.8	-80.09827	26.09981
176	START	952177.7	642585.7	-80.09803	26.09869
176	END	952276.2	642585.7	-80.09773	26.09869
177	START	952756.3	643660.0	-80.09625	26.10164

TRANSECT_ID	START_END	EASTING_X	NORTHING_Y	LONGITUDE	LATITUDE
177	END	952854.8	643660.0	-80.09595	26.10163
178	START	953577.8	643725.6	-80.09374	26.10180
178	END	953676.2	643725.6	-80.09344	26.10180
179	START	953601.6	643068.6	-80.09368	26.09999
179	END	953700.1	643068.6	-80.09338	26.09999
180	START	953577.1	642654.8	-80.09377	26.09885
180	END	953675.6	642654.8	-80.09347	26.09885
181	START	954587.6	643826.6	-80.09066	26.10206
181	END	954686.1	643826.6	-80.09036	26.10206
182	START	954572.8	643161.9	-80.09072	26.10023
182	END	954671.3	643162.2	-80.09042	26.10023
183	START	954554.4	642175.5	-80.09080	26.09752
183	END	954653.0	642175.5	-80.09050	26.09752
184	START	954540.0	642749.4	-80.09083	26.09910
184	END	954638.5	642749.4	-80.09053	26.09909
185	START	955472.7	643192.0	-80.08798	26.10030
185	END	955571.2	643192.0	-80.08768	26.10029
186	START	955500.8	642781.0	-80.08790	26.09916
186	END	955599.3	642781.0	-80.08760	26.09916
187	START	955462.0	642208.0	-80.08803	26.09759
187	END	955560.4	642208.0	-80.08773	26.09759
188	START	956645.6	642388.0	-80.08442	26.09806
188	END	956744.1	642388.0	-80.08412	26.09806
189	START	956958.8	643171.5	-80.08345	26.10021
189	END	957057.3	643171.5	-80.08315	26.10021
190	START	956891.9	642801.6	-80.08366	26.09919
190	END	956990.4	642801.6	-80.08336	26.09919
191	START	956848.7	642227.1	-80.08381	26.09762
191	END	956947.2	642227.1	-80.08351	26.09761
192	START	957352.3	642227.2	-80.08227	26.09761
192	END	957450.8	642227.0	-80.08197	26.09760
194	START	949603.3	637708.8	-80.10598	26.08532
194	END	949603.3	637610.2	-80.10598	26.08505
193	START	949242.1	637994.9	-80.10707	26.08612
193	END	949340.6	637994.9	-80.10677	26.08612
195	START	950414.5	637390.8	-80.10351	26.08443
195	END	950414.5	637292.2	-80.10352	26.08416