MPA Baseline Program

Annual Progress Report

Principal Investigators - please use this form to submit your MPA Baseline Program project annual report, including an update on activities completed over the past year and those planned for the upcoming year. This information will be used by the MPA Baseline Program Management Team to track the progress of individual projects, and will be provided to all MPA Baseline Program PIs and co-PIs prior to the Annual PIs workshop to facilitate discussion of project integration. Please submit this form to California Sea Grant when complete (sgreport@ucsd.edu, Subject [Award Number, project number, PI, "Annual Report"].)

Project Information

Project Year	2	**Study Region**	South Coast
Project Title & Number	R/MPA-27B South coast kelp and shallow rock ecosystems: baseline data collection and long-term trends using historical data		

PI name	Jennifer Caselle	**Co-PI name**	Dan Pondella, Jeremy Claisse

PI Contact Info **Co- PI Contact Info**

(please list additional PIs and contact info in the "Project Personnel" section if necessary)

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Project Goals & Objectives

The *overall goal* of this project is to describe the ecological conditions of kelp and shallow rock ecosystems inside and outside of MPAs in the South Coast Study Region (SCSR) using data collected on SCUBA and to utilize these baseline surveys together with historical data to measure changes in conditions over both short and long time scales.

The *specific objectives* of the proposed surveys and analyses are to: (1) produce a quantitative baseline characterization of the structure of kelp and shallow rock ecosystems in all MPAs in the SCSR, (2) provide quantitative comparisons inside and outside of MPAs, (3) develop easily interpretable ecosystem indicators for assessing the health and status of this ecosystem, (4) inform future monitoring methods while optimizing integration of existing longterm data sets with future monitoring data, and (5) integrate data from the proposed baseline survey with existing long-term data to describe the current trajectory of ecosystem trends.

Summary of Project Activities Completed to Date

Overview of Project Year _1_ Activities, including progress towards meeting goals & objectives

This report describes the activities conducted by the University of California Santa Barbara team (PI Jennifer Caselle) as part of the overall project "South coast kelp and shallow rock ecosystems: baseline data collection and long-term trends using historical data". Note that our partner VRG (co-PI Dan Pondella and Jeremy Claisse) is surveying the southern part of the study region and will provide a separate complementary progress report.

In year 2, we successfully completed the second year of baseline monitoring of kelp forests and rocky reefs. We focused on a) enumerating all the common kelp forest fishes, invertebrates and algae inside and outside of south coast MPAs using methods previously developed by PISCO, b) organizing and synthesizing historical data gathered since 1999 by PISCO, and c) combining all PISCO data (historical and recent) with VRG data to create long-term datasets for synthesis of south coast conditions over time.

Field program: In 2012 we completed the second year of kelp forest surveys at 70 sites inside and outside of all proposed MPAs in the northern part of the Southern California Bight. All sites surveyed in 2011 were resurveyed in 2012. Many of these sites have been continuously surveyd since 1999. With additional funding from the Gordon and Betty Moore Foundation and BOEM we exceeded the number of sites proposed as part of the South Coast Baseline project. Our field season kicked off in June 2012 when we conducted our annual 2-week training program which includes intensive classroom and field training, ensuring consistent and high quality field data collection. Training is a critical part of this program. In addition to the standard PISCO-style surveys of kelp forest organisms, we gathered a second year of targeted size frequency surveys on a variety of invertebrate species identified as potentially important to south coast MPAs.

Data entry and quality control: All data gathered in 2012 were entered throughout the dive season. Data entry was completed three weeks following the last surveys (Dec. 2012). As part of the PISCO program, we have developed thorough QA/QC procedures to ensure data quality. SAS code for these procedures is available by request from the PI. All QA/QC was completed by February 2013. Datasets are documented in eml (ecological markup language) and will be made available to the public on the PISCO web-based datserver (http://osu.piscoweb.org/DataCatalogAccess/DataCatalogAccess.html). Due to major structural overhauls to the PISCO data server as well as the transition to the DATAONE system as part of NCEAS, 2011-12 data are not yet accessible on the site. We anticipate these data being made public on the PISCO/NCEAS data server by winter 2014. All baseline data from 2011-2012 will be made public through Ocean Spaces.

Historical Data Integration: Historical data (dating back to 1999) from PISCO are available and ready to analyze. During 2012, we continued to work with Co-PIs Pondella and Claisse to create a single dataset combining data from the CRANE 2004 program, the BIGHT08 program and our own 2011-12 MLPA South Coast baseline data into a single 'historical' dataset. We have also written a detailed outline and are continuing analyses for a paper utilizing this dataset as a means to characterize baseline conditions in Southern California rocky reefs. We have also completed a Master taxonomic lookup table that contains taxonomic code information for the following surveys and survey programs: PISCO, Santa Barbara Coastal LTER, Vantuna Research group, CRANE, and Reef Check. This lookup table will greatly facilitate joint analysis by providing logical groupings of species and species groups across programs.

Kelp Forest Indicators of Ecosystem Health: Over the past year, PIs Caselle and Pondella worked with Ken Schiff of SCCWRP to develop a proposal and outline for a workshop to develop a series of data-driven, quantitative indicators of rocky reef health. We have support of SCWRRP and had planned on holding the workshop in the Fall of 2012 but postponed it due to overlap in both timing, topic and potential invitees with the Marine Protected Area Monitoring Enterprise Expert Judgement workshops. SCCWRP has assigned a staff member to assisting and we are assembling the list of invitees and will have information out in the Fall of 2013.

Highlights from project progress so far, such as successes achieved or interesting stories from the past year

2012 was characterized by realtively calm weather. Storms were infrequent and our surveys were conducted without problems. This alone serves as a highlight when conducitng subtidal research over such a large and variable region.

In 2012, the water temperature was "average to warm" likely due to ENSO (El Nino Southern Oscillation)-neutral conditions. As such, we have no out of the ordinary observations in kelp forests to report.

One important success is that we now have a complete, two-year dataset on the size distributions of many large invertebrate species in our kelp forests. This is the first dataset to our knowledge on these important species, many of which are subject to emerging fisheries in California. This dataset will provide a very solid baseline form which to measure changes in MPAs and changes in fished areas. Size structure is a critical variable for many of the new data-poor stock assessment methods being developed here in California.

Description of any unforeseen events and substantial challenges, and resulting effect on data collection

There were no substantial challenges in 2012. Work was completed on time and all data collection was performed.

Data status (i.e., paper/raw format or digitized; if digitized, what format?)

All of our data from 2012 are entered, quality checked and available for analysis. The metadata is in EML format and is publically accessible on the PISCO web based server while the raw data have not yet been made available at that location due to major upgrades to our data servers over the past year. We anticipate all data being made publically available by winter 2014 on Ocean Spaces as well as the PISCO data server.

Additionally, data from the multiple proposed existing long-term datasets has been processed and integrated into the single long-term database which is now ready for analysis.

Finally, we made great progress on collecting oceanographic data to contextualize the baseline characterization of the south coast. Specifically, we have created R code for pulling satellite data compiled by the California Current Coastal LTER project (http://spg.ucsd.edu/Satellite_data/California_Current/). This code allows the user to specify their own geographic coordinates as well as the time frame of interest to download both chlrophyll and sea surface temperature data. Currently, we have created 15-day averages fro both variables at all of the Rocky Reef subtidal sites in Southern California. We have also obtained the Santa Barbara coastal LTER data on kelp biomass from SPOT stellite imagery. All of these datasets (and code creating custom datasets) are available to SCSR PIs for use in the synthetic products and analyses

Activities Planned for following Project Year _2_ (if applicable) – *Please describe remaining work and approximate timelines for completing that work, including any anticipated budget variances necessary to complete the project.*

While data collection and data QA/QC has proceeded on schedule, a 1 year no-cost extension is requested due to delays in complementary data availability from other SCSR synergistic projects (data from multiple projects data will not be available due to their sampling and processing timetables until early 2014, and the particularly valuable EcoTrust socio-economic fisheries data is not likely going to be available until July 2014). We were informed of the delay at the Synergistic Projects PI Meeting this past spring and after discussions with the MPA Monitoring Enterprise, we think that moving forward it makes the most sense from an efficiency standpoint to delay proceeding with data analysis until we have access to all explanatory variables and complementary datasets.

Therefore, we are requesting a 1 yr extension from the originally proposed timeline to complete the analyses and report generation for our project. The SCSR Synergistic Projects conference calls and workshops have been an extremely valuable process and discussions which have occurred to date have helped to improve the scope of the planned analyses that should be beneficial to all projects involved.

Therefore the revised timeline for our project now is:
Data synthesis and analysis relating to specific objectives 1-5 will be completed by December of 2014.
Development of monitoring recommendations (specific objective 4) will occur from October 2014 through January of 2015.
Final report writing will occur from October 2014 through March of 2015.
A formal No-Cost Extension request is also being submitted to Dr. James Eckman concurrent with this Annual Progress Report.

Project Personnel – *Please indicate additional project personnel involved in your MPA baseline project, including students and volunteers, or additional PI contact information if necessary.*

	Students Supported	*Student Volunteers*
K-12		
Undergraduate	*3*	*5*
Masters	*1*	
PhD		

Number of other Volunteers not counted above:

Additional PI contact info not listed on first page:

Cooperating Organizations and Individuals - *Please list organizations or individuals (e.g., federal or state agencies, fishermen, etc.) that provided financial, technical or other assistance to your project since its inception, including a description of the nature of their assistance.*

Name of Organization or Individual	*Sector (City, County, Fed, private, etc.)*	*Nature of cooperation (If financial, provide dollar amount.)*
PISCO funded by the Gordon and Betty Moore Foundation	private	Significant funding for fieldwork and personnel in 2012. See match report for exact amounts.
Bureau of Ocean Energy and Management (BOEM)	Federal	Funding for complementary surveys and analysis

Additional Information – *Please provide any other project-relevant information, such as descriptions of attached materials, media coverage your project has received, etc.*

The PISCO team was highlighted in the Ocean to Ocean campaign of Nautica company. This is an ocean awareness campaign that features the stories of people and places that inspire and highlights those who share the company's deep passion and commitment to the water.

The short piece can be found here:
http://nauticaocean2ocean.com/story/the-marine-science-institute-students/

Appendix 1. Figures and Tables for annual report.

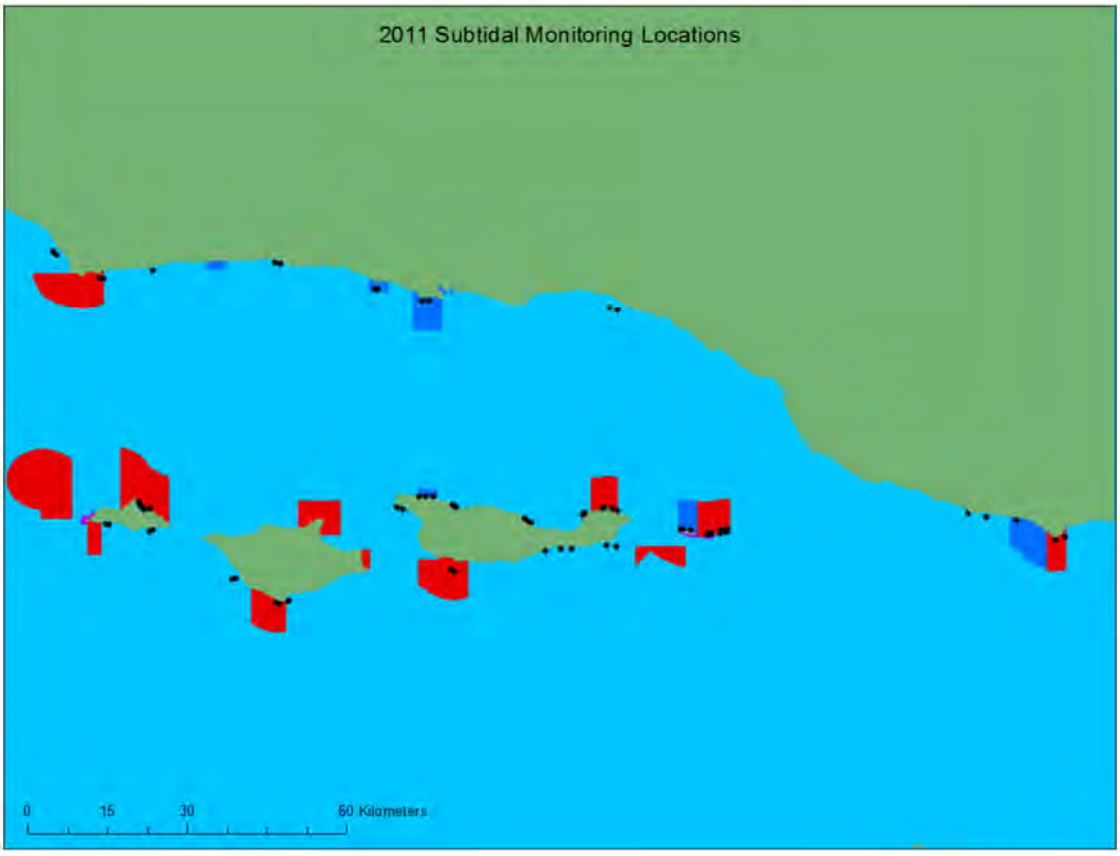

Figure 1. Map showing locations of survey sites (black dots) inside and outside of State Marine Reserves (red) and State Marine Conservation Areas (Blue). In total, 70 sites were sampled in 2011.

Table 1. List of sites surveyed in the northern part of the Southern California bight for the MLPA south coast baseline rocky reef survey in 2011.

SITE NAME	SIDE	LAT	LON	CURRENT RESERVE STATUS
ANACAPA-BLACK SEABASS REEF (FISH SURVEY ONLY)	CENTRAL	34.0127	-119.3889	INSIDE ANACAPA SMR, NO TAKE SINCE 2003
ANACAPA-EAST ISLE	CENTRAL	34.0179	-119.3634	INSIDE ANACAPA SMR, NO TAKE SINCE 1978
ANACAPA-EAST ISLE	EAST	34.0177	-119.3619	INSIDE ANACAPA SMR, NO TAKE SINCE 1978
ANACAPA-EAST ISLE	WEST	34.0161	-119.3712	INSIDE ANACAPA SMR, NO TAKE SINCE 1978
ANACAPA-LIGHTHOUSE REEF	CENTRAL	34.0125	-119.3632	OPEN TO FISHING
ANACAPA-LIGHTHOUSE REEF	EAST	34.0136	-119.3601	OPEN TO FISHING

ANACAPA-LIGHTHOUSE REEF	WEST	34.0106	-119.3722	OPEN TO FISHING
ANACAPA-MIDDLE ISLE	CENTRAL	34.0094	-119.3883	INSIDE ANACAPA SMR, NO TAKE SINCE 2003
ANACAPA-MIDDLE ISLE	EAST	34.0087	-119.3882	INSIDE ANACAPA SMR, NO TAKE SINCE 2003
ANACAPA-MIDDLE ISLE	WEST	34.0078	-119.3947	INSIDE ANACAPA SMR, NO TAKE SINCE 2003
ANACAPA-WEST ISLE	CENTRAL	34.0171	-119.4340	INSIDE ANACAPA SMCA, ALL TAKE PROHIBITED EXCEPT RECREATIONAL AND COMMERCIAL LOBSTER AND PELAGIC FINFISH SINCE 2003
ANACAPA-WEST ISLE	EAST	34.0166	-119.4229	INSIDE ANACAPA SMCA, ALL TAKE PROHIBITED EXCEPT RECREATIONAL AND COMMERCIAL LOBSTER AND PELAGIC FINFISH SINCE 2004
ANACAPA-WEST ISLE	WEST	34.0171	-119.4380	INSIDE ANACAPA SMCA, ALL TAKE PROHIBITED EXCEPT RECREATIONAL AND COMMERCIAL LOBSTER AND PELAGIC FINFISH SINCE 2005
ARROYO QUEMADO	EAST	34.4665	-120.1170	OPEN TO FISHING
ARROYO QUEMADO	WEST	34.4685	-120.1251	OPEN TO FISHING
BULLITO	CENTRAL	34.4554	-120.3317	OPEN TO FISHING
COJO	EAST	34.4414	-120.4157	INSIDE POINT CONCEPTION SMR, NO TAKE SINCE 2012
COJO	WEST	34.4433	-120.4220	INSIDE POINT CONCEPTION SMR, NO TAKE SINCE 2012
COUNTY LINE	CENTRAL	34.0436	-118.9524	OPEN TO FISHING
EL MATADOR	CENTRAL	34.0334	-118.8699	INSIDE POINT DUME SMCA, NO TAKE EXCEPT RECREATIONAL TAKE OF PELAGIC FINFISH BY SPEAR, AND COMMERCIAL TAKE OF COASTAL PELAGIC BY ROUND HAUL NET AND SWORDFISH BY HARPOON SINCE 2012
HORSESHOE REEF	EAST	34.3893	-119.5451	OPEN TO FISHING
HORSESHOE REEF	WEST	34.3920	-119.5578	OPEN TO FISHING
IV REEF	EAST	34.4030	-119.8645	INSIDE CAMPUS POINT SMCA, NO TAKE SINCE 2012
IV REEF	WEST	34.4036	-119.8768	INSIDE CAMPUS POINT SMCA, NO TAKE SINCE 2012
JALAMA	NORTH	34.4872	-120.4998	OPEN TO FISHING
JALAMA	SOUTH	34.4818	-120.4947	OPEN TO FISHING
LEO CARRILLO	CENTRAL	34.0374	-118.9219	OPEN TO FISHING
LITTLE DUME	CENTRAL	34.0049	-118.7892	INSIDE POINT DUME SMR, NO TAKE SINCE 2012
NAPLES	CENTRAL	34.4220	-119.9517	INSIDE NAPLES SMCA, NO TAKE EXCEPT RECREATIONAL TAKE OF PELAGIC FINFISH BY SPEAR AND COMMERCIAL TAKE OF GIANT KELP

				SINCE 2012
NAPLES	EAST	34.4233	-119.9511	INSIDE NAPLES SMCA, NO TAKE EXCEPT RECREATIONAL TAKE OF PELAGIC FINFISH BY SPEAR AND COMMERCIAL TAKE OF GIANT KELP SINCE 2012
NAPLES	WEST	34.4246	-119.9555	INSIDE NAPLES SMCA, NO TAKE EXCEPT RECREATIONAL TAKE OF PELAGIC FINFISH BY SPEAR AND COMMERCIAL TAKE OF GIANT KELP SINCE 2012
POINT DUME	CENTRAL	33.9988	-118.8060	INSIDE POINT DUME SMR, NO TAKE SINCE 2012
SCI-CAVERN POINT	EAST	34.0547	-119.5680	INSIDE SCORPION SMR, NO TAKE SINCE 2003
SCI-CAVERN POINT	WEST	34.0530	-119.5710	INSIDE SCORPION SMR, NO TAKE SINCE 2003
SCI-COCHE POINT	EAST	34.0454	-119.6017	OPEN TO FISHING
SCI-COCHE POINT	WEST	34.0424	-119.6041	OPEN TO FISHING
SCI-FORNEY	EAST	34.0515	-119.9093	OPEN TO FISHING
SCI-FORNEY	WEST	34.0543	-119.9189	OPEN TO FISHING
SCI-GULL ISLE	EAST	33.9465	-119.8232	INSIDE GULL ISLAND SMR, NO TAKE SINCE 2003
SCI-GULL ISLE	WEST	33.9497	-119.8274	INSIDE GULL ISLAND SMR, NO TAKE SINCE 2003
SCI-HAZARDS	CENTRAL	34.0566	-119.8212	OPEN TO FISHING
SCI-HAZARDS	EAST	34.0549	-119.8192	OPEN TO FISHING
SCI-HAZARDS	WEST	34.0578	-119.8248	OPEN TO FISHING
SCI-PAINTED CAVE	CENTRAL	34.0729	-119.8710	INSIDE PAINTED CAVE SMCA, NO TAKE EXCEPT RECREATIONAL TAKE OF LOBSTERS AND PELAGIC FINFISH SINCE 2003
SCI-PAINTED CAVE	EAST	34.0723	-119.8578	INSIDE PAINTED CAVE SMCA, NO TAKE EXCEPT RECREATIONAL TAKE OF LOBSTERS AND PELAGIC FINFISH SINCE 2003
SCI-PAINTED CAVE	WEST	34.0738	-119.8815	INSIDE PAINTED CAVE SMCA, NO TAKE EXCEPT RECREATIONAL TAKE OF LOBSTERS AND PELAGIC FINFISH SINCE 2003
SCI-PELICAN	CENTRAL	34.0307	-119.6969	OPEN TO FISHING
SCI-PELICAN	EAST	34.0285	-119.6910	OPEN TO FISHING
SCI-PELICAN	WEST	34.0355	-119.7024	OPEN TO FISHING
SCI-SCORPION	EAST	34.0483	-119.5462	INSIDE SCORPION SMR, NO TAKE SINCE 2003
SCI-SCORPION	WEST	34.0525	-119.5550	INSIDE SCORPION SMR, NO TAKE SINCE 2003

SCI-VALLEY	CENTRAL	33.9843	-119.6413	OPEN TO FISHING
SCI-VALLEY	EAST	33.9849	-119.6226	OPEN TO FISHING
SCI-VALLEY	WEST	33.9806	-119.6673	OPEN TO FISHING
SCI-YELLOWBANKS	CENTRAL	33.9885	-119.5470	OPEN TO FISHING
SCI-YELLOWBANKS	WEST	33.9894	-119.5646	OPEN TO FISHING
SMI-CROOK POINT	EAST	34.0151	-120.3314	OPEN TO FISHING
SMI-CROOK POINT	WEST	34.0147	-120.3378	OPEN TO FISHING
SMI-CUYLER	EAST	34.0518	-120.3465	OPEN TO FISHING
SMI-CUYLER	WEST	34.0572	-120.3519	OPEN TO FISHING
SMI-HARRIS POINT RESERVE	EAST	34.0523	-120.3385	INSIDE HARRIS POINT SMR, NO TAKE SINCE 2003
SMI-HARRIS POINT RESERVE	WEST	34.0639	-120.3566	INSIDE HARRIS POINT SMR, NO TAKE SINCE 2003
SMI-TYLER BIGHT	EAST	34.0258	-120.4063	OPEN TO FISHING
SMI-TYLER BIGHT	WEST	34.0270	-120.4118	OPEN TO FISHING
SRI-CLUSTER POINT	NORTH	33.9328	-120.1978	OPEN TO FISHING
SRI-CLUSTER POINT	SOUTH	33.9338	-120.1913	OPEN TO FISHING
SRI-JOHNSONS LEE SOUTH	EAST	33.8973	-120.1009	OPEN TO FISHING
SRI-JOHNSONS LEE SOUTH	WEST	33.8951	-120.1041	OPEN TO FISHING
SRI-SOUTH POINT	EAST	33.8918	-120.1187	INSIDE SOUTH POINT SMR, NO TAKE SINCE 2003
SRI-SOUTH POINT	WEST	33.8947	-120.1249	INSIDE SOUTH POINT SMR, NO TAKE SINCE 2003

2011 PISCO Mapbook

includes MLPA South Coast Baseline monitoring sites

Contact Dr. Jennifer Caselle
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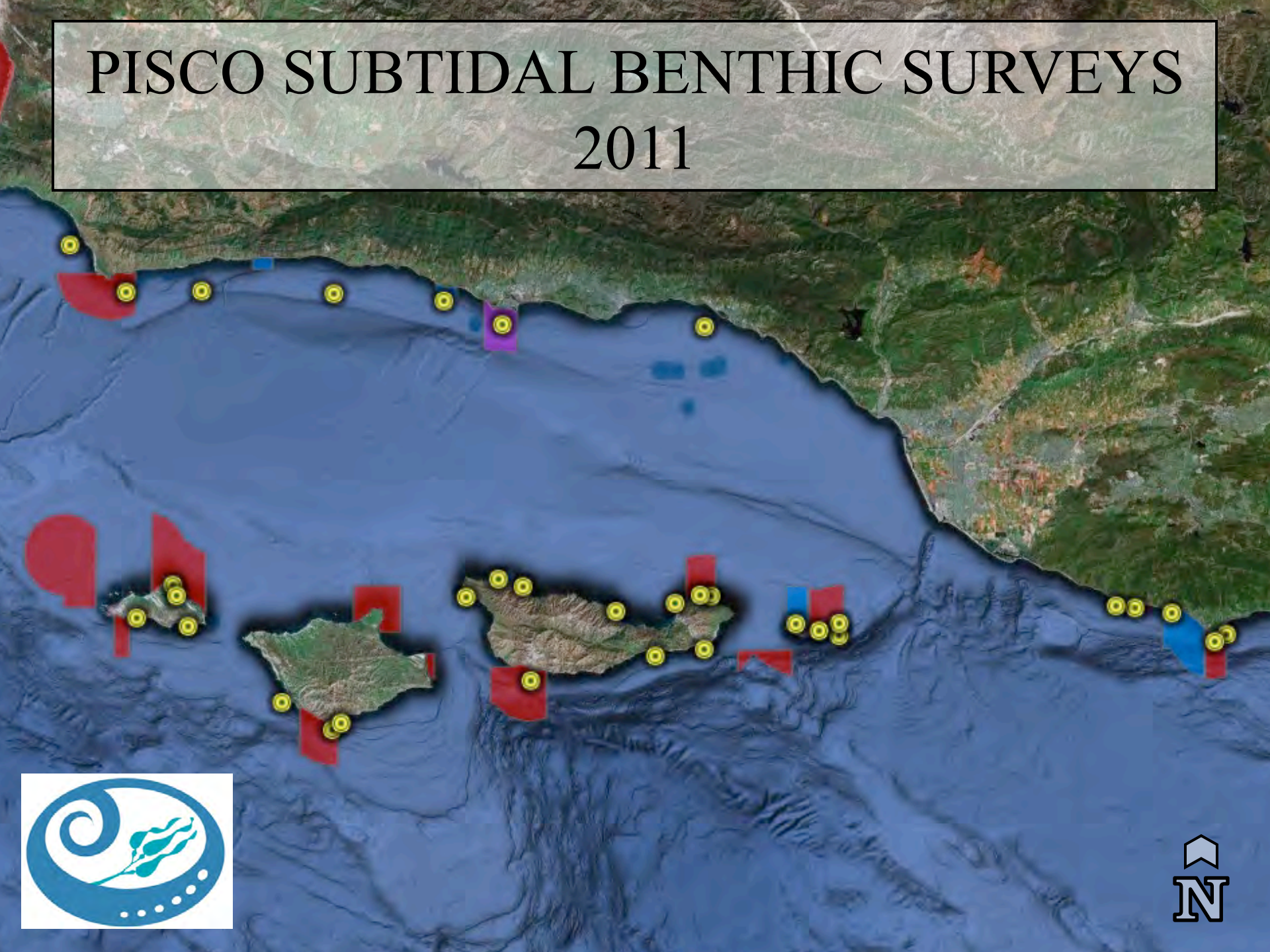
Santa Barbara, CA 93117
caselle@msi.ucsb.edu

PISCO SUBTIDAL BENTHIC SURVEYS 2011




MAINLAND
N
NAPLES
JALAMA
IV REEF
HORSESHOE REEF
COJO
ARROYO QUEMADO
BULLITO
COUNTY LINE
LITTLE DUME
LEO CARRILLO
POINT DUME
EL MATADOR

JALAMA

N OUTER	34° 29.217' N	120° 29.970' W
N INNER/MID	34° 29.350' N	120° 29.742' W
S OUTER	34° 28.896' N	120° 29.670' W
S INNER/MID	34° 28.982' N	120° 29.447' W

Urchins

DO NOT SAMPLE

(Not enough present)

N OUTER	60-70 FT	120
N MID	25-35 FT	120
N INNER	20-30 FT	120
S OUTER	60-70 FT	120
S MID	25-35 FT	120
S INNER	20-25 FT	120

NOTES: Non-Reserve

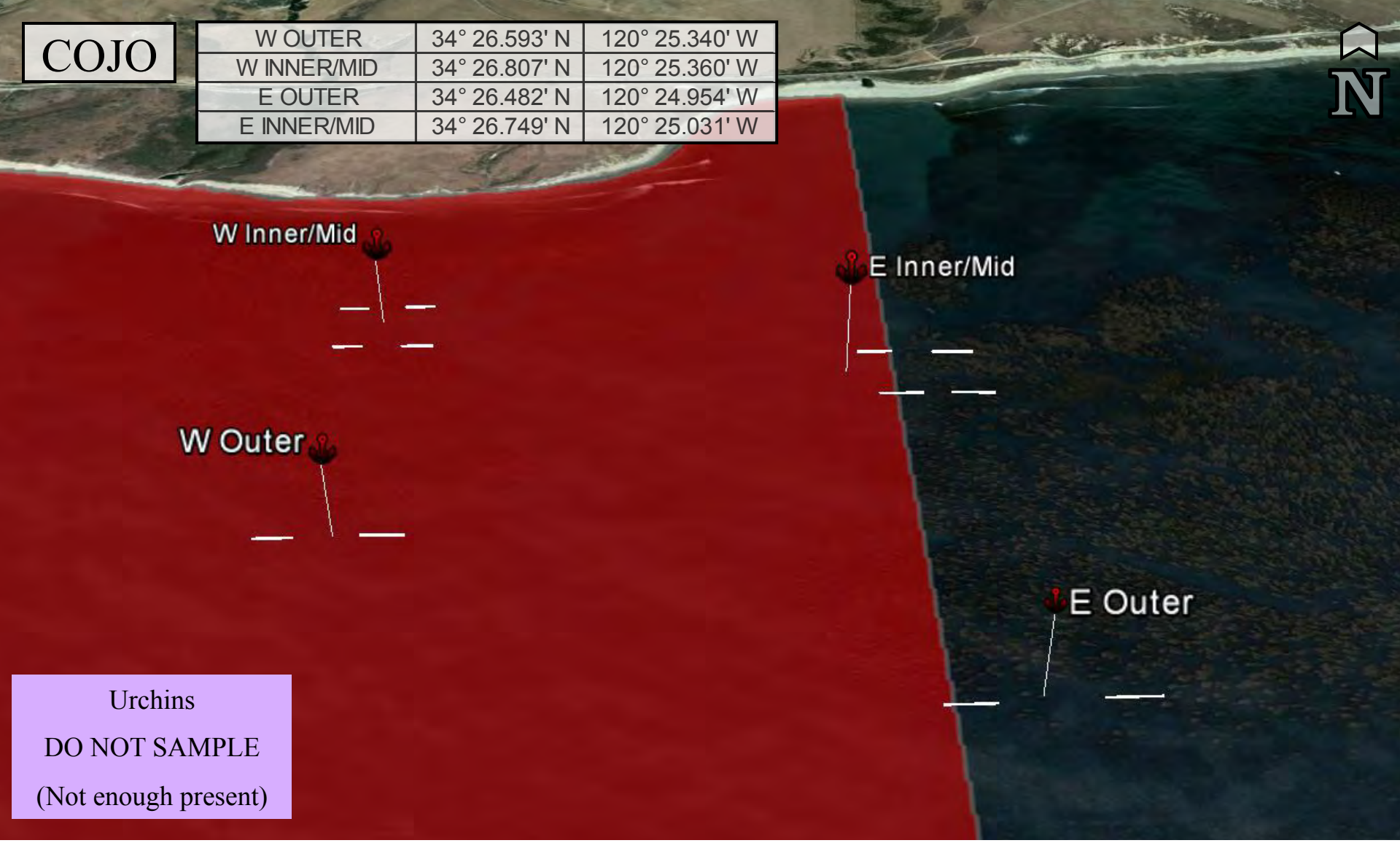
Low relief. Plenty of reef – contiguous. Sand channel between two sides. When there is a lot of kelp, may have to anchor in sand channel and run transects all in one direction. Must survey at anchor points, which means a surface swim if there is a lot of kelp. Inners can be patchy and stirred up. May need to anchor inside of kelp bed for inners/mids. Some years very little kelp present.

S: Inners run along thin reef strip about 50m inshore of kelp bed. Mid run along inshore edge of kelp bed.

N: Inners and inmids have more reef to the north than to the south of the numbers.

COJO

W OUTER	34° 26.593' N	120° 25.340' W
W INNER/MID	34° 26.807' N	120° 25.360' W
E OUTER	34° 26.482' N	120° 24.954' W
E INNER/MID	34° 26.749' N	120° 25.031' W



W OUTER	60-70 FT	90
W MID	25-35 FT	90
W INNER	20-25 FT	90
E OUTER	50-60 FT	90
E MID	25-35 FT	90
E INNER	20-25 FT	90

NOTES: Site straddles Point Conception SMR boundary. No take within reserve.

Large sand channel between the two sides. May need to anchor on one end of side and run transects in one direction due to large kelp bed. Low relief bedrock, easily stirred up.

E: Inner/Mid run transects to the east from anchor. Anchorpoint should be edge of reef

BULLITO

CEN OUTER	34° 27.326' N	120° 19.923' W
CEN MID/INNER	34° 27.490' N	120° 19.894' W

Urchins

DO NOT SAMPLE

(Not enough present)

OUTER	40-42 FT	240
MID	25-30 FT	240
INNER	15-20 FT	240

NOTES: Non-Reserve

This is a half site (side CEN). Also an LTER site.

Run transects to the west from the anchor points. Outside edge of reef is super flat shale transitioning to sand

ARROYO QUEMADO

W	34° 28.101' N	120° 07.511' W
E OUTER	34° 27.977' N	120° 07.018' W
E MID/INNER	34° 28.050' N	120° 07.030' W

Urchins

East (Outers/Mids)

W OUTER	45-50 FT	70
W MID	25-30 FT	70
W INNER	20-25 FT	70
E OUTER	40-50 FT	70
E MID	25-30 FT	70
E INNER	15-20 FT	70

NOTES: Non-Reserve

All zones have good, low relief reef except inners which are patchy. Flat bedrock with some low ledges.

W: Can swim to all zones from one anchor point. Run all transects toward the west from anchor points. Mid transects start ~20m west of anchor.

E: Sandy channel to the west of transects, make sure to start far enough to the east. Anchor point is center of site.

NAPLES

W	34° 25.478' N	119° 57.319' W
CEN	34° 25.311' N	119° 57.090' W
E	34° 25.400' N	119° 57.061' W

Reef Check Site
"Naples Reef"

Urchins
CEN (Inners & Outers)

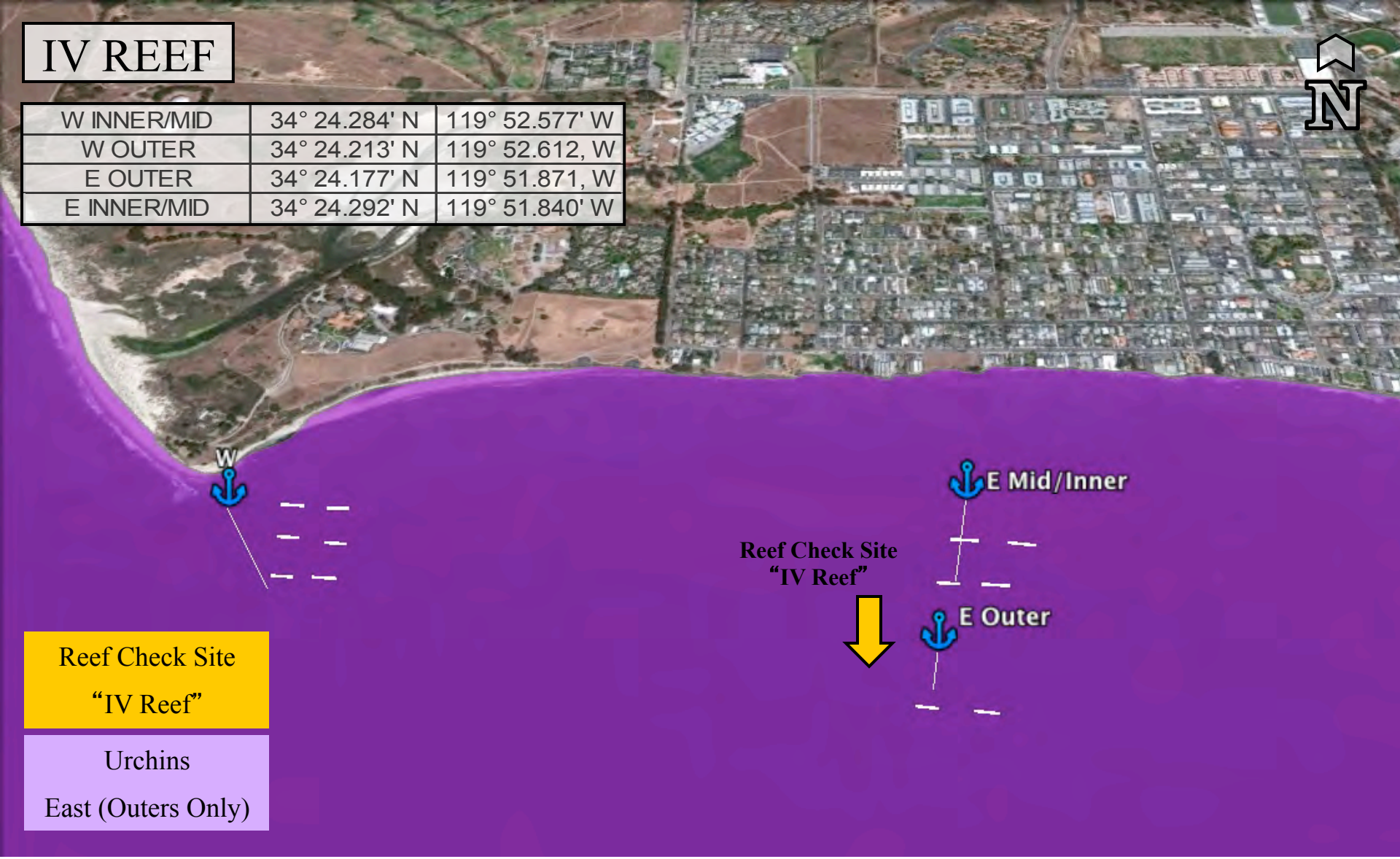
E OUTER	35-45 FT	90
E INNER	35-40 FT	90
CEN OUTER	45-50 FT	90
CEN INNER	25-30 FT	90
W OUTER	40-45 FT	90
W INNER	25-30 FT	90

NOTES: *Inside Naples SMCA, all take prohibited except pelagic finfish by spear and commercial kelp harvest.*

It is possible to anchor between E and CEN in a large boat and swim to the spots.
CEN: Is "Three Fingers" - Run inners along the top of the ridge and outers along the offshore down-slope.
E: Is "Main Naples" - Inners and outers are run at similar depths. Reef has some ridges.
W: Is "Little Naples." More reef to the east of the anchor point. Reef is flat, shaley, with low ridges. There is a higher ridge that comes up to ~30'. Run inners along that and outers to the North (deeper). Run all transects to the east.
Reef Check Site "Naples Reef" 34°25.311' N, 119°57.090' W (Same as our side CEN numbers.)

IV REEF

W INNER/MID	34° 24.284' N	119° 52.577' W
W OUTER	34° 24.213' N	119° 52.612, W
E OUTER	34° 24.177' N	119° 51.871, W
E INNER/MID	34° 24.292' N	119° 51.840' W



W OUTER	30-40 FT	90
W MID	25-30 FT	90
W INNER	20 FT	90
E OUTER	35-40 FT	90
E MID	25-30 FT	90
E INNER	15-20 FT	90

NOTES: Inside Campus Point SMCA, no take.
E: Run transects to west from anchor. Reef varies from medium to no relief. Flattens out toward the east so run all transects to the west.
W: Transects run East from the point. All zones shallow towards the point and get deeper towards the East. No reef less than ~20' depth.
Reef Check Site "IV Reef" 34°24.183' N, 119°51.965' W

HORSESHOE REEF

W OUTER	34° 23.504' N	119° 33.462' W
W MID/INNER	34° 23.652' N	119° 33.612' W
E OUTER	34° 23.367' N	119° 32.686' W
E MID/INNER	34° 23.452' N	119° 32.473' W

Urchins

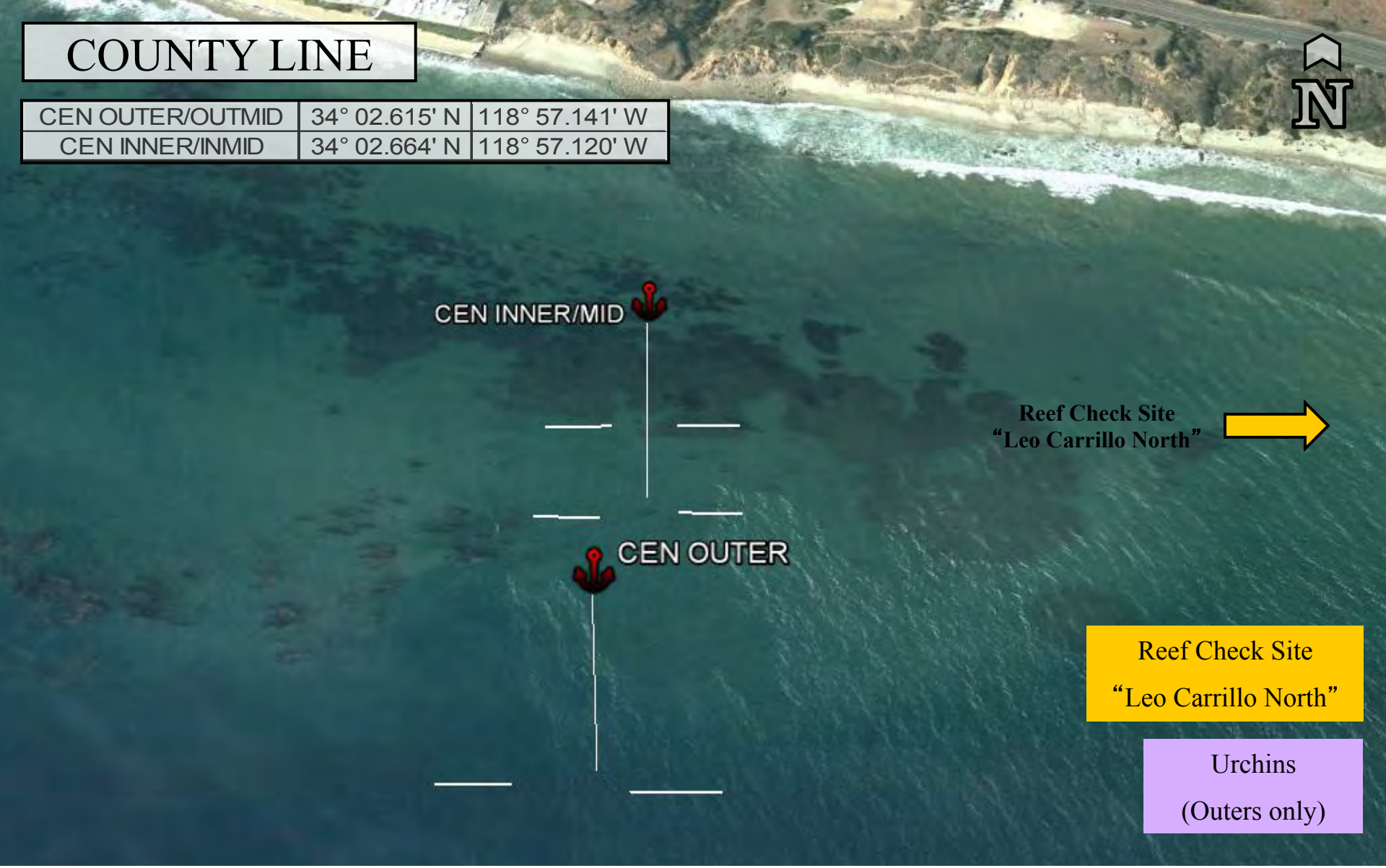
West (Inners only)

W OUTER	40-45 FT	60
W MID	30 FT	60
W INNER	25-30 FT	60
E OUTER	30-35 FT	90
E MID	25 FT	90
E INNER	15-20 FT	90

NOTES: Non-Reserve
E: Mid/Inner anchor point is over the mids, swim in for the inners. Anchor points are center of site.
W: Numbers are center points.

COUNTY LINE

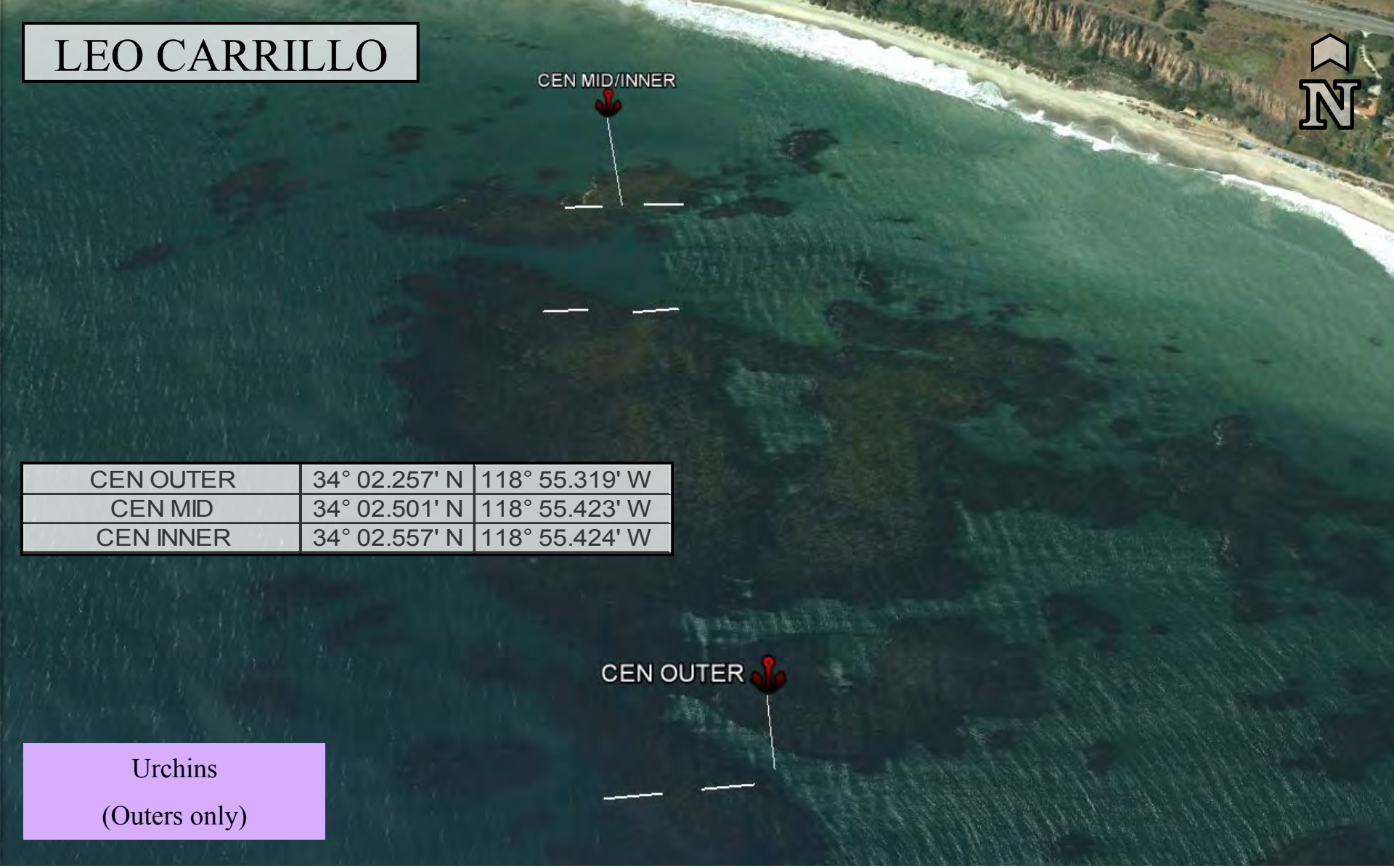
CEN OUTER/OUTMID	34° 02.615' N	118° 57.141' W
CEN INNER/INMID	34° 02.664' N	118° 57.120' W



OUTER	38-40 FT	90
MID	20-25 FT	90
INNER	15-20 FT	90

NOTES: Non-Reserve
OUTER: There are a few sand channels to navigate around. Run one transect in each direction.
MID: anchor spot for INNER/MID is perfect depth for MID transects
Reef Check Site "Leo Carillo North" 34°2.612' N, 118°56.697' W (0.25 nm due East of OUTER)

LEO CARRILLO



CEN OUTER	34° 02.257' N	118° 55.319' W
CEN MID	34° 02.501' N	118° 55.423' W
CEN INNER	34° 02.557' N	118° 55.424' W

Urchins

(Outers only)

OUTER	38-40 FT	90
MID	25-35 FT	90
INNER	15-20 FT	90

NOTES: Non-Reserve
OUTER: Run transects to West. Large oval shaped reef comes up to ~40’ in center.
MID: Swim offshore of inner anchor point to another section of reef.
INNER: Anchor point is midpoint.

EL MATADOR

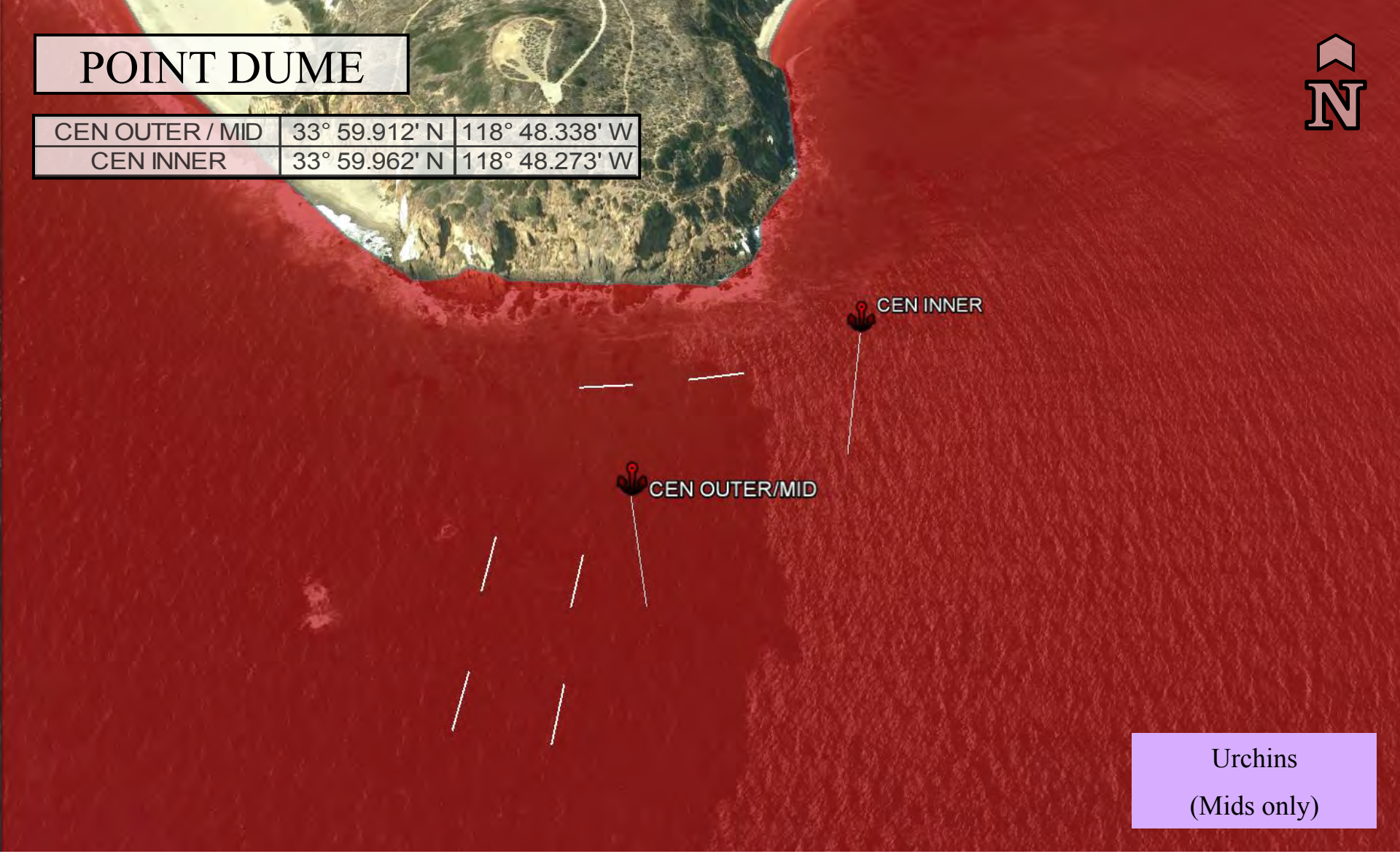
CEN OUTER	34° 01.997' N	118° 52.210' W
CEN INNER/MID	34° 02.113' N	118° 52.286' W

OUTER	45-50 ft	90
MID	25-30 ft	90
INNER	15-20 ft	90

NOTES: Inside Point Dume SMCA, all take prohibited except recreational take of pelagic finfish by spear and commercial take of coastal pelagic species by round haul net and swordfish by harpoon.
OUTER: Run transects to East. Run along middle of large oval shaped reef.
INNER/MID: Run transects to East.
Reef Check Site "Lechuza" 34°2.042' N, 118°52.279' W

POINT DUME

CEN OUTER / MID	33° 59.912' N	118° 48.338' W
CEN INNER	33° 59.962' N	118° 48.273' W

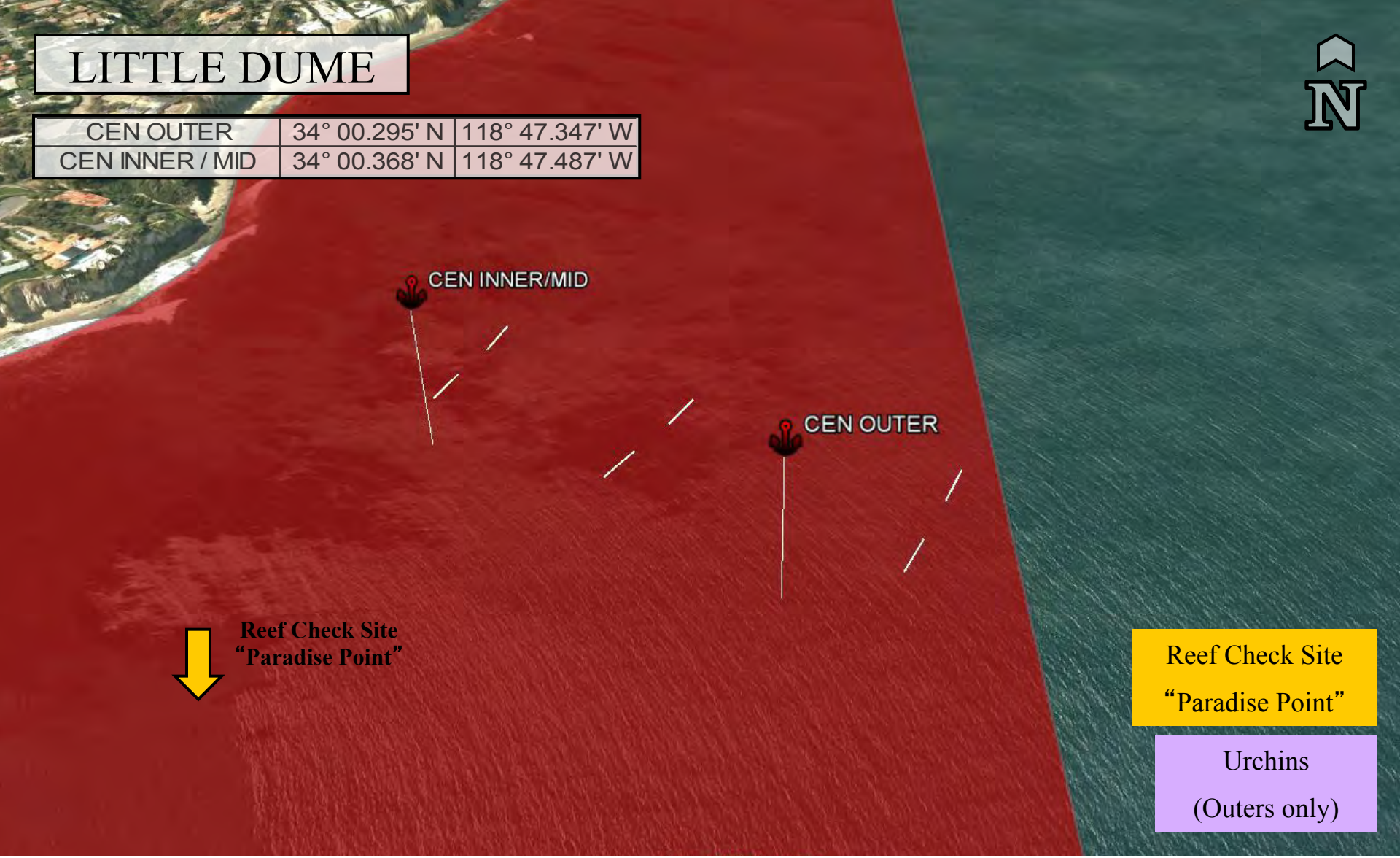


CEN OUTER	35 ft	20
CEN MID	25 ft	20
CEN INNER	16 ft	60

NOTES: Inside Point Dume SMR, no take.
CEN: INNERS are to the North against the point. OUTER/MIDS are out off of the point in front of the wash rocks.

LITTLE DUME

CEN OUTER	34° 00.295' N	118° 47.347' W
CEN INNER / MID	34° 00.368' N	118° 47.487' W



CEN OUTER	38-43 ft	40
CEN MID	25-30 ft	40
CEN INNER	15-20 ft	40

NOTES: Inside Point Dume SMR, no take.
Run transects to East of anchor points.
OUTER anchor point is in ~40ft. Reef gets deeper to the East.
INNER/MID anchor point is correct depth for Inners.
For Mids, swim offshore to 25-30 feet from INNER/MID anchor point.
Reef Check Site "Paradise Point" 34°0.248' N, 118°47.574' W


SANTA CRUZ ISLAND
N
CAVERN POINT
PAINTED CAVE
SCORPION
HAZARDS
COCHE
FORNEY
PELICAN
YELLOWBANKS
VALLEY
GULL ISLE

VALLEY

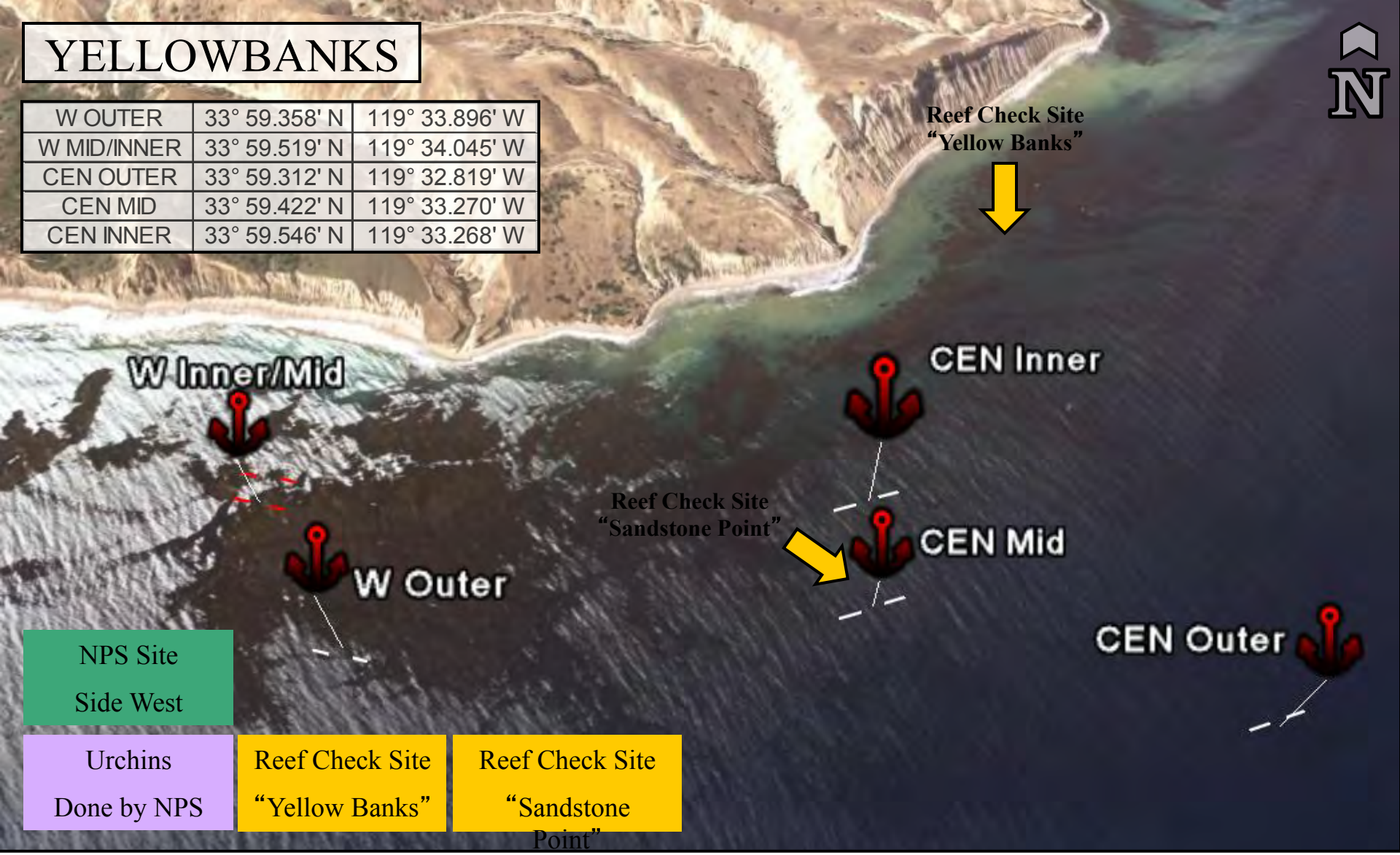
E	33° 59.033' N	119° 37.358' W
CEN	33° 59.060' N	119° 38.489' W
W	33° 58.853' N	119° 40.028' W

E OUTER	35-40 FT	90
E INNER	20-25 FT	90
CEN OUTER	30-35 FT	90
CEN INNER	15-25 FT	90
W OUTER	25-30 FT	90
W INNER	20-25 FT	90

NOTES: Non-Reserve
Anchor points are good for outers. Swim inshore for inners.
CEN: Reef is patchy. Will silt out on south swell.

YELLOWBANKS

W OUTER	33° 59.358' N	119° 33.896' W
W MID/INNER	33° 59.519' N	119° 34.045' W
CEN OUTER	33° 59.312' N	119° 32.819' W
CEN MID	33° 59.422' N	119° 33.270' W
CEN INNER	33° 59.546' N	119° 33.268' W



CEN OUTER	50-60 FT	100
CEN MID	30-35 FT	100
CEN INNER	20-30 FT	100
W OUTER	55-65 FT	90
W MID	40-45 FT	90
W INNER	30-35 FT	90

NOTES: Non-Reserve

W and CEN are the two sides of this site. There is no E. Varied substrate over site. Each zone can be very different.

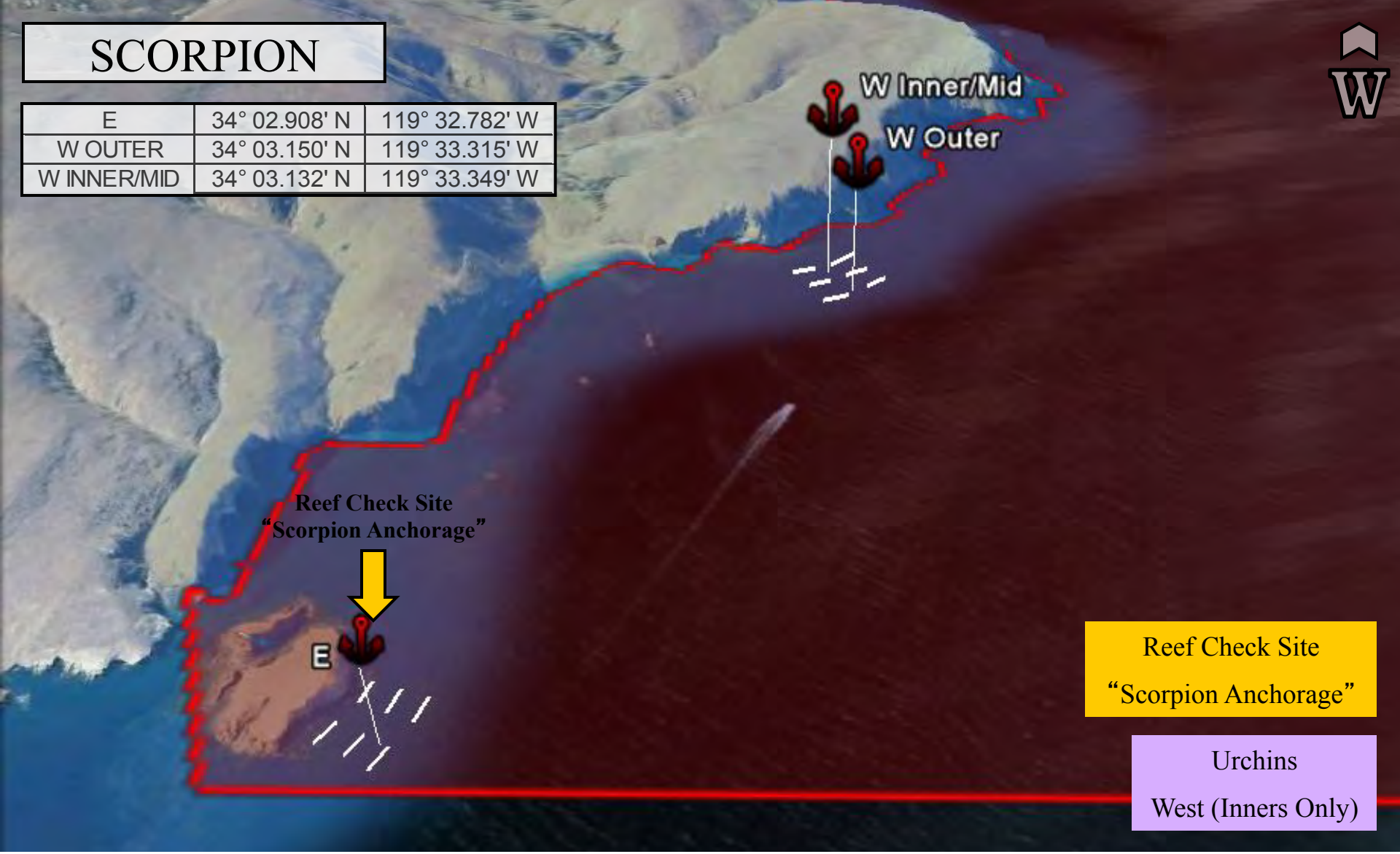
W: Inner/mid anchor point is good for mids. Swim in for inners.

Reef Check Site "Yellow Banks" 33°59.928' N, 119°33.030' W

Reef Check Site "Sandstone Point" 33°59.442' N, 119°33.264' W

SCORPION

E	34° 02.908' N	119° 32.782' W
W OUTER	34° 03.150' N	119° 33.315' W
W INNER/MID	34° 03.132' N	119° 33.349' W



E OUTER	60-65 FT	120
E MID	35-40 FT	120
E INNER	15-25 FT	120
W OUTER	38-40 FT	120
W MID	25-30 FT	120
W INNER	15-20 FT	120

NOTES: Inside Scorpion SMR, no take.
W: Outers patchy, hard to find reef. Reef is under anchor point. Run west
E: Inners are up on the wall. Mids are slightly offshore of rock on raised section of reef. Outers are deep.

Reef Check Site "Scorpion Anchorage" 34°02.908' N, 119°32.880' W

CAVERN POINT

E	34° 03.257' N	119° 34.012' W
W	34° 03.165' N	119° 34.278' W

E OUTER	45-55 FT	30
E MID	30-35 FT	30
E INNER	15-25 FT	30
W OUTER	40 FT	110
W MID	25-30 FT	110
W INNER	15-20 FT	110

NOTES: Inside Scorpion SMR, no take.
Whole site is very exposed to W swell.
W: Reef does not extend very far offshore. Midpoint is small point jutting out.
E: Has extensive high relief reef. Big washrock to the north of anchor point. Run transects to the south of the point on coastline that bends inward. Has permanent KFM transect.

COCHE POINT

E	34° 02.696' N	119° 36.084' W
W	34° 02.559' N	119° 36.240' W

E OUTER	50-60 FT	30
E MID	30-40 FT	30
E INNER	15-25 FT	30
W OUTER	50-60 FT	30
W MID	30-40 FT	30
W INNER	15-25 FT	30

NOTES: Non-reserve.
E: Midpoint is the part of the cliff that juts out. Has permanent KFM transects.
W: Outers are mostly to the east of the anchor point. Otherwise has extensive reef.

PELICAN

E	34° 01.683' N	119° 41.455' W
CEN	34° 01.839' N	119° 41.799' W
W	34° 02.152' N	119° 42.138' W

E OUTER	35-45 FT	140
E INNER	15-25 FT	140
CEN OUTER	40-45 FT	120
CEN INNER	15-20 FT	120
W OUTER	35-40 FT	30
W INNER	15-25 FT	30

NOTES: Non-reserve.
W: Midpoint is where rock face changes from white to black.
CEN: Midpoint is large crack in cliff face. This site has a large cobble channel running perpendicular to the coastline. Avoid laying transects on it.
E: Midpoint is largest rock at base of rockslide.
Reef Check Site "Pelican Anchorage" 34°2.142' N, 119°42.150' W

HAZARDS

E	34° 03.263' N	119° 49.161' W
CEN	34° 03.395' N	119° 49.270' W
W	34° 03.486' N	119° 49.490' W

TX1/TX2

E OUTER	35-45 FT	120
E INNER	15-20 FT	120
CEN OUTER	35-45 FT	120
CEN INNER	15-20 FT	120
W OUTER	40-45 FT	80/30
W INNER	15-20 FT	80/30

NOTES: Non-reserve.
W: Transects 1 outers at base of wall, inners on top of shelf above wall. These are run on the east side of the large cave- Do not run into cave. Transects 2 are run on the opposite side.
CEN: Midpoint is the washrock that juts the farthest out from the island.
E: Midpoint is large phallic rock. Reef doesn't extend very far offshore. Transects angle slightly around contours of reef to maintain a constant depth.

PAINTED CAVE

E	34° 04.314' N	119° 51.453' W
CEN	34° 04.372' N	119° 52.259' W
W	34° 04.469' N	119° 52.928' W

TX1/TX2

E OUTER	40-45 FT	90/30
E INNER	15-20 FT	90/30
CEN OUTER	40-45 FT	90
CEN INNER	15-25 FT	90
W OUTER	40-50 FT	160
W INNER	20-25 FT	160

NOTES: Inside Painted Cave SMCA, Take of all living marine resources is prohibited except for the recreational take of lobster and pelagic finfish.
E: Has plenty of reef that drops steeply and extends deeper than deepest transects. Midpoint is a rocky protuberance that is to the east of a cave. Transect 1 runs along main wall, transect 2 runs in toward the cave.
CEN: Midpoint is crack in cliff-face.
W: Midpoint is a bend in the shoreline.
Reef Check Site "Cueva Valdez" 34°3.300' N, 119°48.600' W (0.5 nm East of side East)

FORNEYS

W OUTER	34° 03.233' N	119° 55.092' W
W INNER/MID	34° 03.273' N	119° 55.155' W
E OUTER	34° 03.089' N	119° 54.580' W
E INNER/MID	34° 03.188' N	119° 54.480' W

Urchins

East (Inner & Outer)

E OUTER	45-50 FT	120
E MID	25-30 FT	120
E INNER	15-25 FT	120
W OUTER	35-40 FT	120
W MID	30-35 FT	120
W INNER	10-20 FT	120

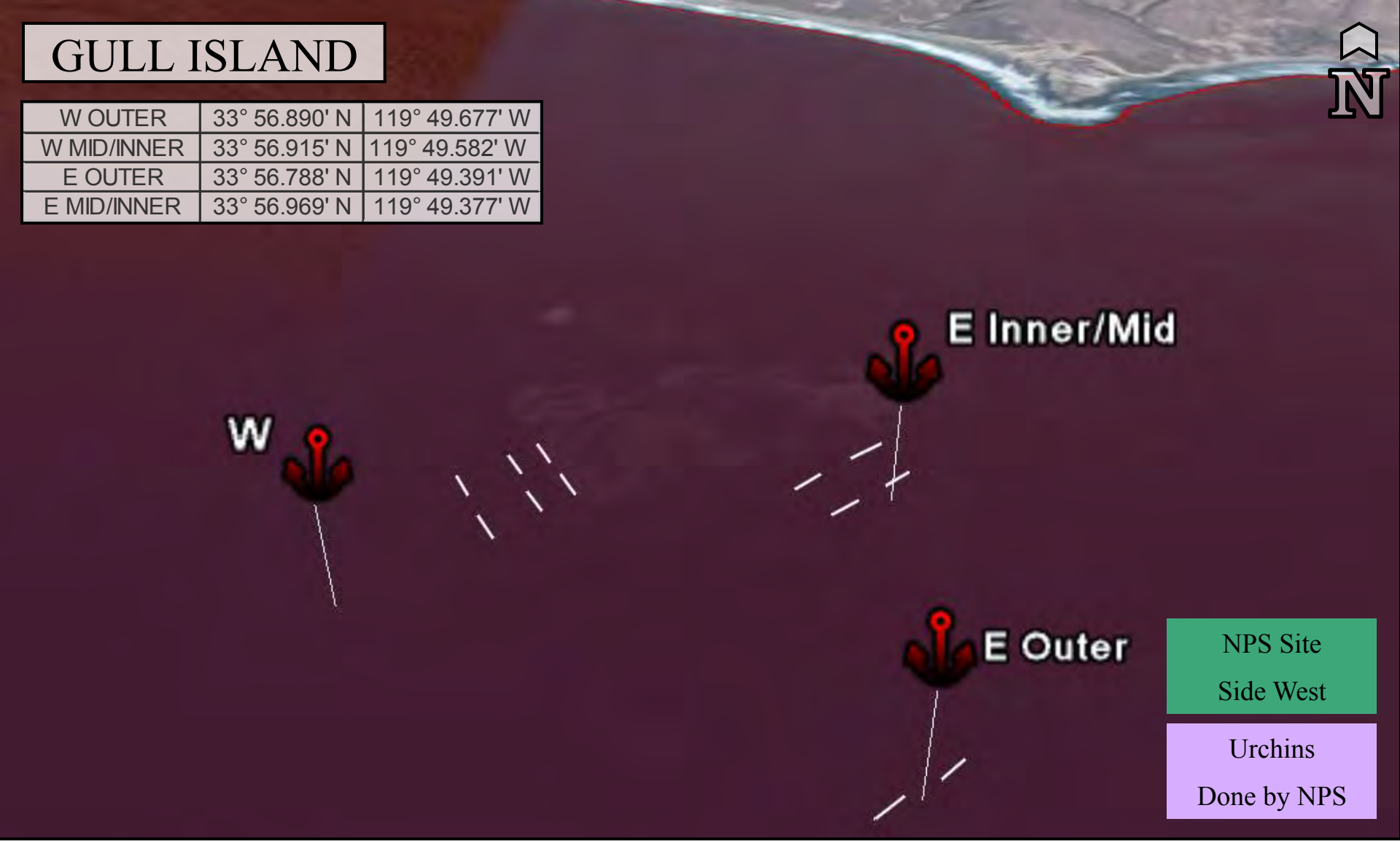
NOTES: Non-reserve.

W: Inners along rocky finger that runs out at the south of the cove. Mids are offshore to the north of the inners. Outers are off of the point

E: Outers/mids have more reef to west of anchor point. Outer reef is fairly low relief. Use kelp to indicate where inner reef is. Usually anchor to the west of the kelp bed and run transects toward the east. There is sand between the Outers and Mids.

GULL ISLAND

W OUTER	33° 56.890' N	119° 49.677' W
W MID/INNER	33° 56.915' N	119° 49.582' W
E OUTER	33° 56.788' N	119° 49.391' W
E MID/INNER	33° 56.969' N	119° 49.377' W



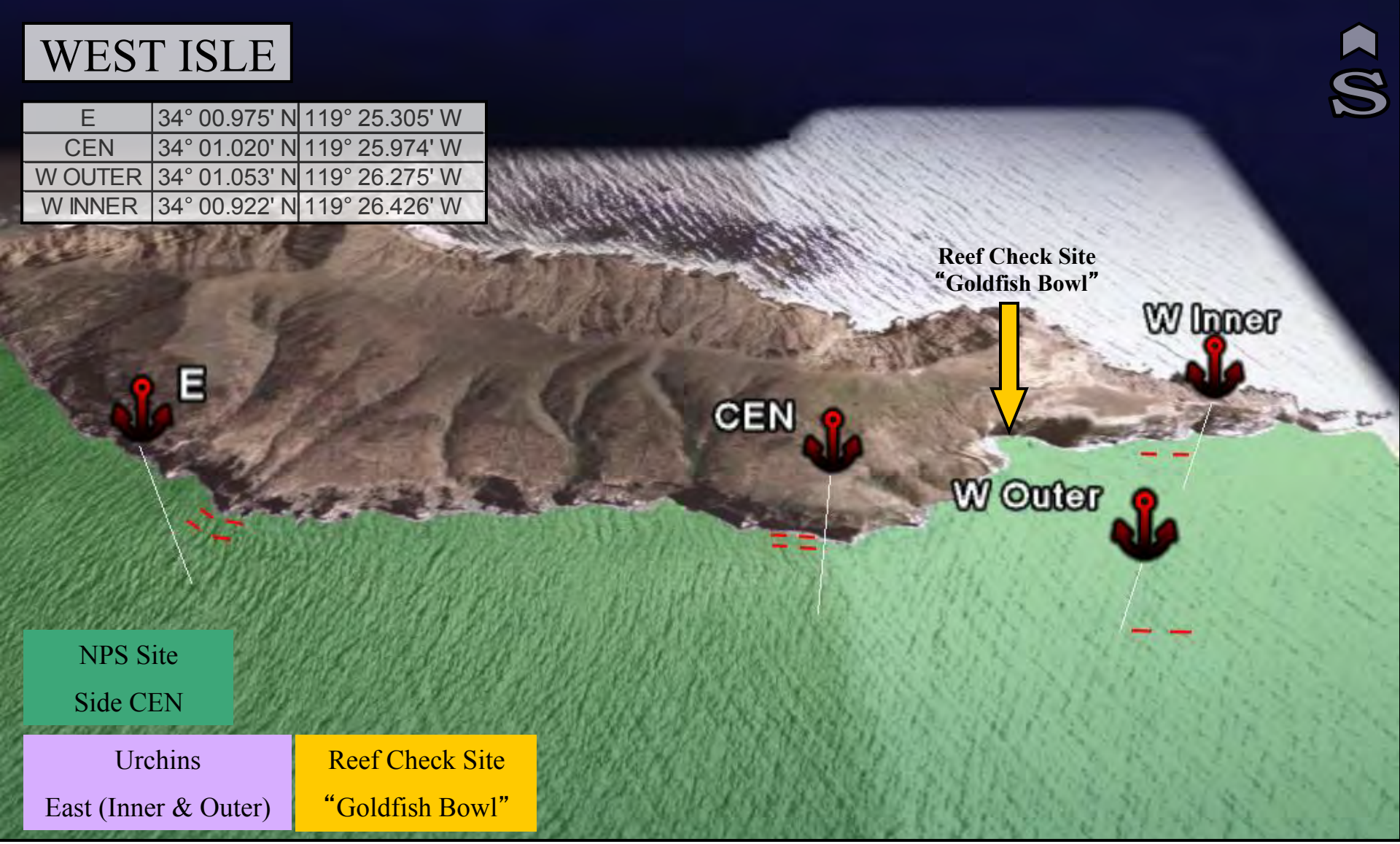
E OUTER	60-70 FT	30
E MID	30-35 FT	30
E INNER	15-20 FT	30
W OUTER	55-70 FT	120
W MID	30-35 FT	120
W INNER	20-30 FT	120

NOTES: Inside Gull Island SMR, no take.
Lots of current. Always.
E: Outers are along a steep drop off near to anchor point. Inners/mids has a shallow spot that will break with S swell.
W: Has high relief, follow depth contour.


ANACAPA ISLAND
N
WEST ISLE
EAST ISLE
MIDDLE ISLE
LIGHTHOUSE REEF

WEST ISLE

E	34° 00.975' N	119° 25.305' W
CEN	34° 01.020' N	119° 25.974' W
W OUTER	34° 01.053' N	119° 26.275' W
W INNER	34° 00.922' N	119° 26.426' W



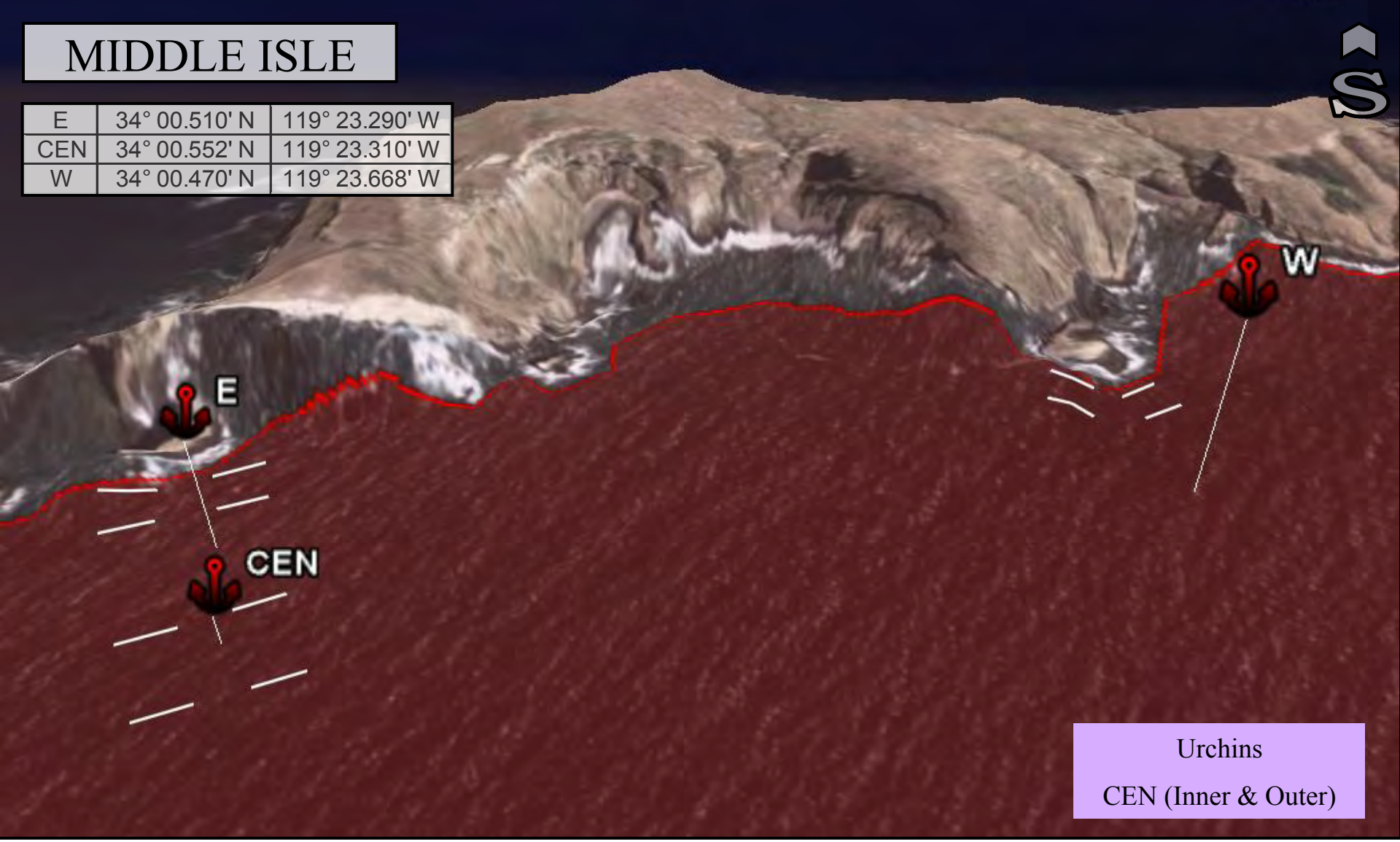
E OUTER	30-35 FT	120
E INNER	15-20 FT	120
CEN OUTER	35-45 FT	90
CEN INNER	15-20 FT	90
W OUTER	80-90 FT	90
W INNER	18-23 FT	90

NOTES: Inside Anacapa Island SMCA, take of all living marine resources is prohibited except for the recreational take of lobster and pelagic finfish and the commercial take of spiny lobster.
W: Outers are very deep right below anchor point. Small section of reef. Midpoint of inners is a large cave.
E: Midpoint is large, tall rock.
CEN: Transects run on wall, midpoint is protuberance.

Reef Check Site "Goldfish Bowl" 34°0.882' N, 119°26.250' W

MIDDLE ISLE

E	34° 00.510' N	119° 23.290' W
CEN	34° 00.552' N	119° 23.310' W
W	34° 00.470' N	119° 23.668' W

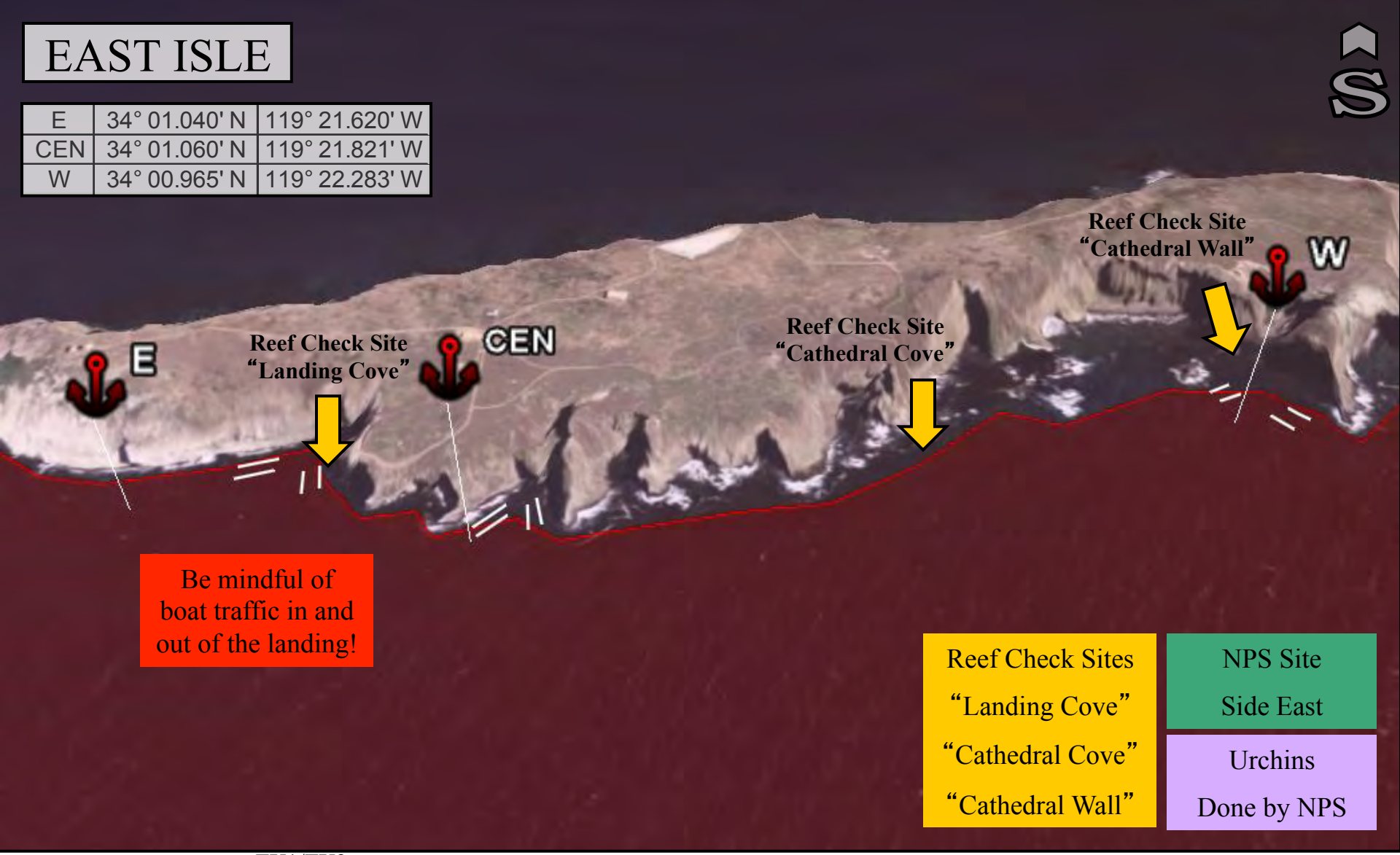


		TX1/TX2
E OUTER	25-30 FT	60
E INNER	15-20 FT	60
CEN OUTER	35-40 FT	60
CEN INNER	30-35 FT	60
W OUTER	25-30 FT	120/240
W INNER	15-20 FT	120/240

NOTES: Inside Anacapa Island SMR, no take.
W: Transects hug the contours around both sides of the washrock.
CEN: Has more habitat to the east. Possible to for E and CEN to share an anchor point. Anchor point is in sand- you have to swim in to the reef.

EAST ISLE

E	34° 01.040' N	119° 21.620' W
CEN	34° 01.060' N	119° 21.821' W
W	34° 00.965' N	119° 22.283' W



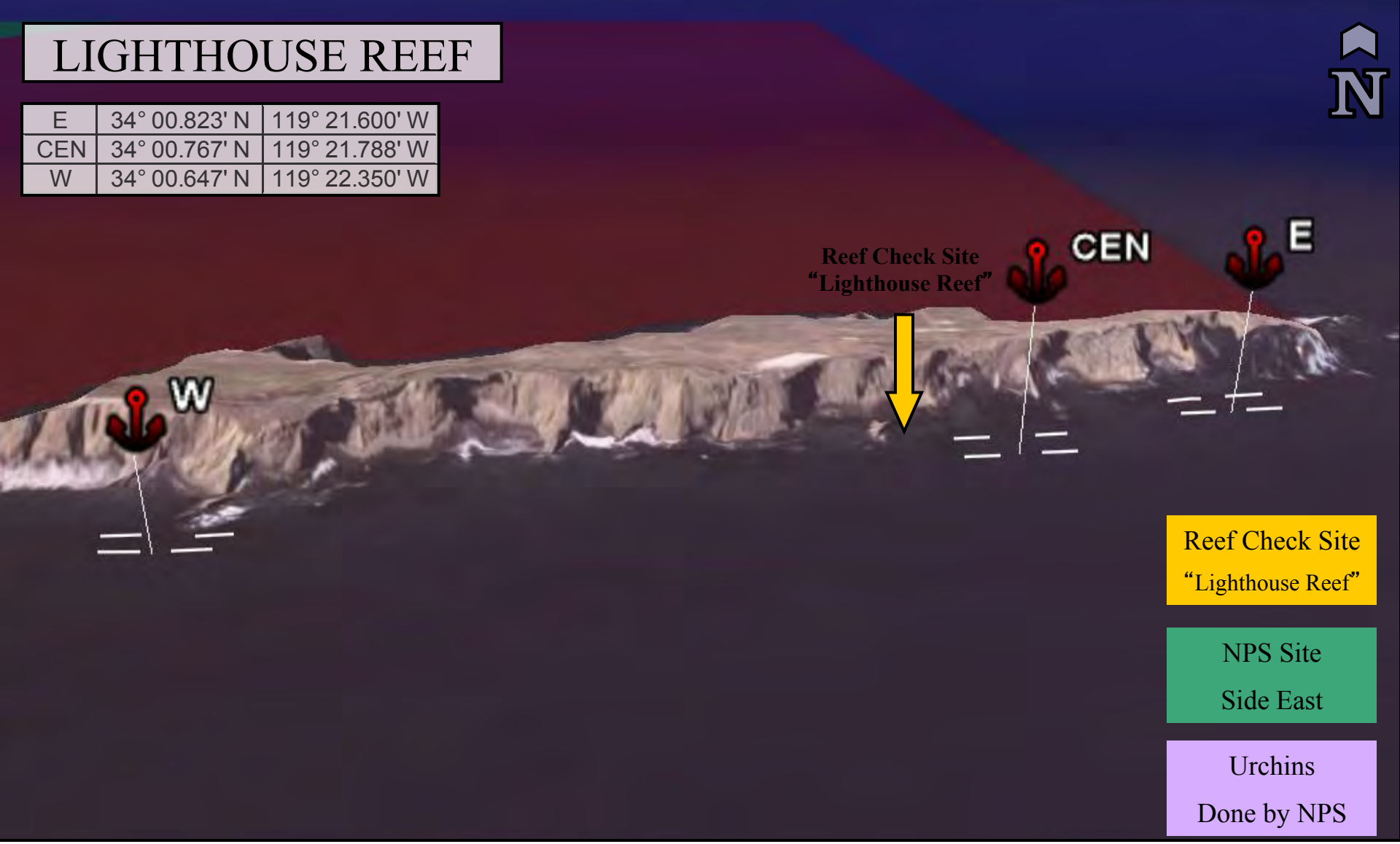
TX1/TX2

E OUTER	35-40 FT	30/120
E INNER	15-20 FT	30/120
CEN OUTER	35-40 FT	30/120
CEN INNER	20-25 FT	30/120
W OUTER	20-30 FT	60/140
W INNER	15-20 FT	60/140

NOTES: Inside Anacapa Island SMR, no take.
E: Transects run on opposite sides of the landing. Inner transect 1 on wall, outer 1 at base of wall by underwater arch.
CEN: Transects are run on either side of cove.
W: Is "Cathedral Cove." Transect 1's run offshore of rock, transect 2's on wall to the west.
Reef Check Site "Landing Cove" 34°1.050' N, 119°21.744' W
Reef Check Site "Cathedral Cove" 34°0.990' N, 119°22.104' W
Reef Check Site "Cathedral Wall" 34°0.948' N, 119°22.290' W

LIGHTHOUSE REEF

E	34° 00.823' N	119° 21.600' W
CEN	34° 00.767' N	119° 21.788' W
W	34° 00.647' N	119° 22.350' W



Reef Check Site
"Lighthouse Reef"

NPS Site
Side East

Urchins
Done by NPS

E OUTER	25-30 FT	90
E INNER	15-20 FT	90
CEN OUTER	15-20 FT	90
CEN INNER	10-15 FT	90
W OUTER	25-30 FT	90
W INNER	15-20 FT	90

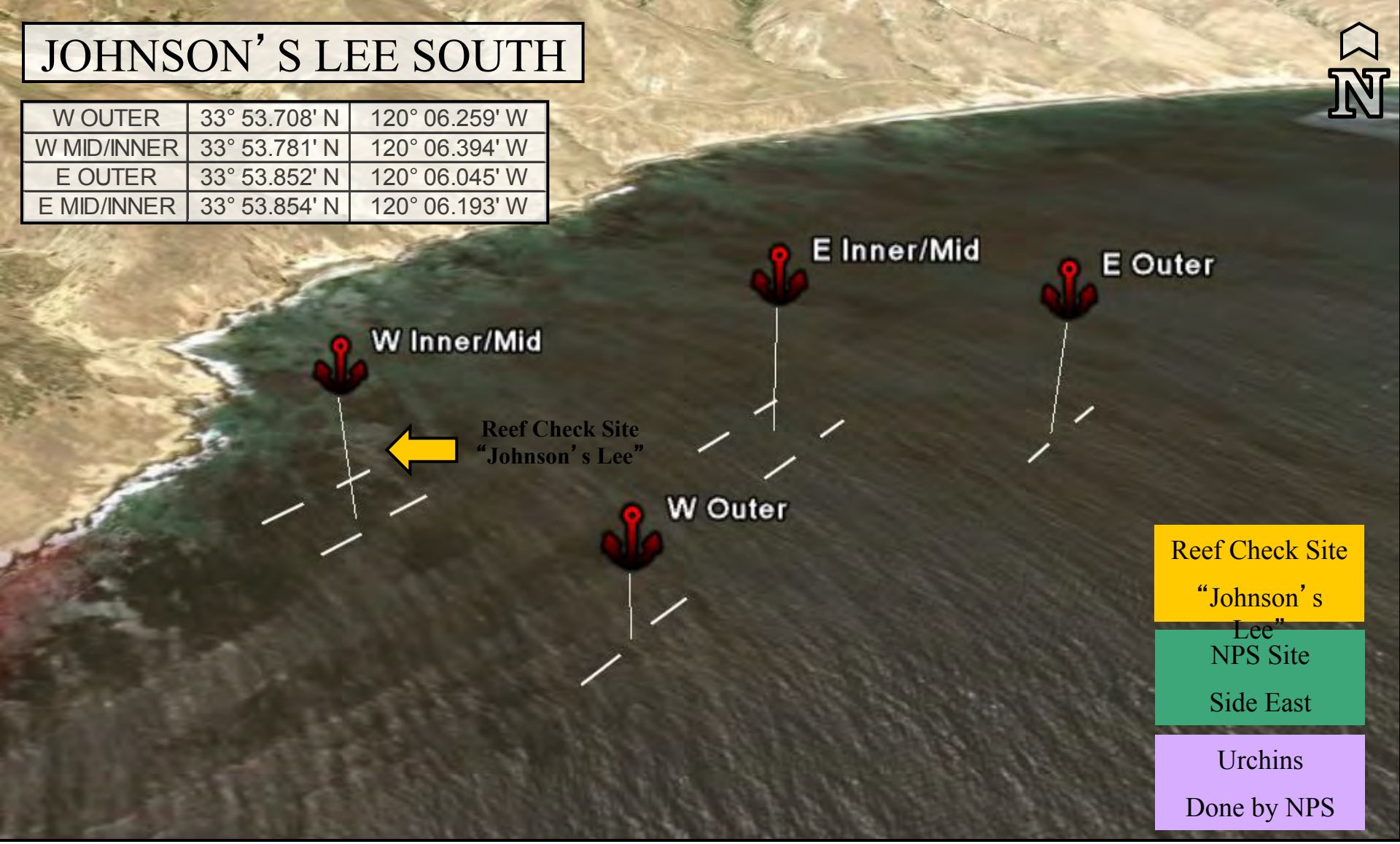
NOTES: Non-reserve.
W: Transect 2 located south of rock, transect 1 run to west of transect 2.
CEN: Transects located to the east of large rock. Outers are on offshore reef past large sand channel. Anchor point is on part of inner reef which juts out from island.

Reef Check Site "Lighthouse Reef" 34°0.756' N, 119°21.852' W


SANTA ROSA ISLAND
N
CLUSTER POINT
JOHNSONS LEE SOUTH
SOUTH POINT

JOHNSON'S LEE SOUTH

W OUTER	33° 53.708' N	120° 06.259' W
W MID/INNER	33° 53.781' N	120° 06.394' W
E OUTER	33° 53.852' N	120° 06.045' W
E MID/INNER	33° 53.854' N	120° 06.193' W



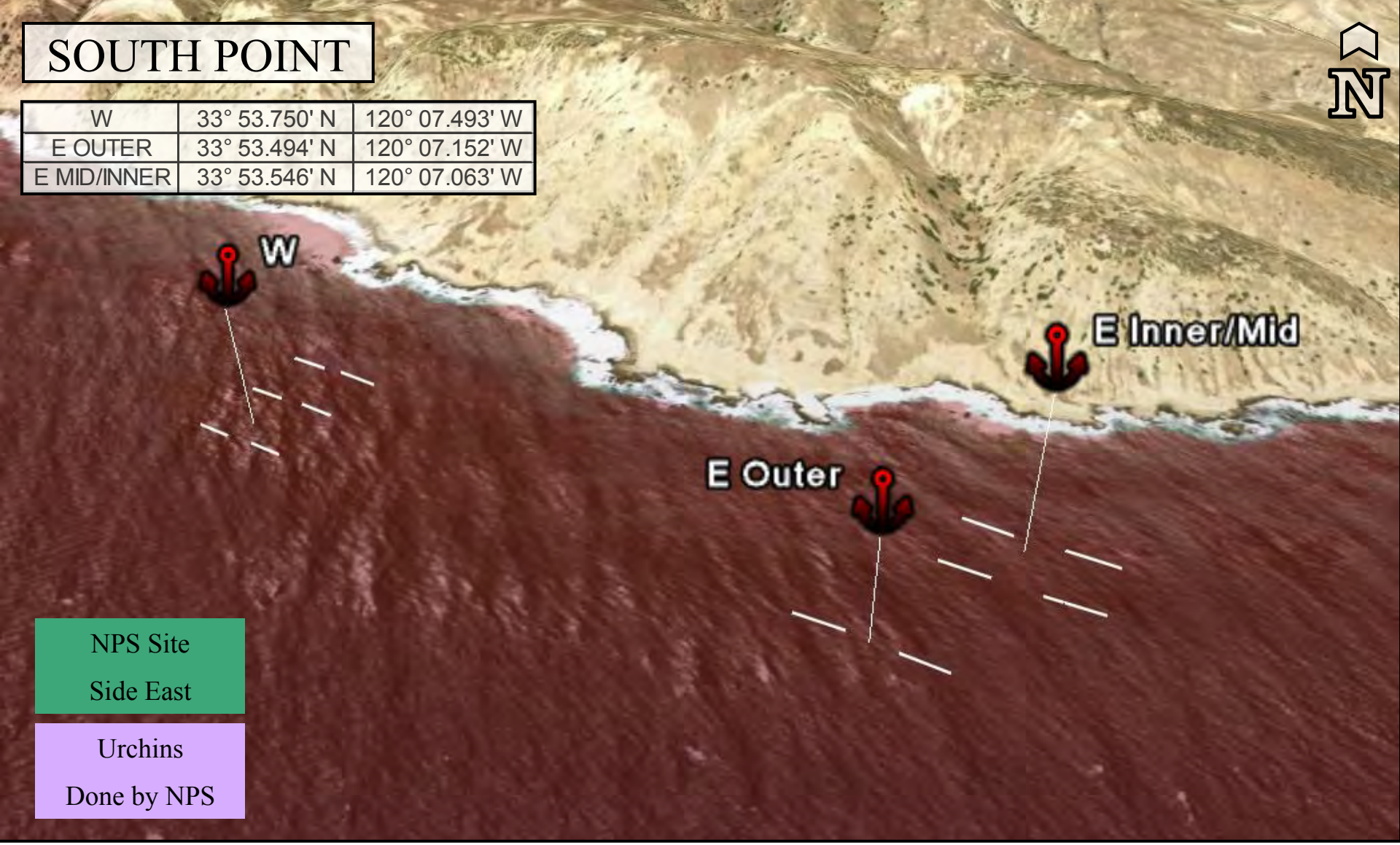
E OUTER	40-50 FT	30
E MID	35-45 FT	30
E INNER	35-45 FT	30
W OUTER	50-55 FT	30
W MID	35-45 FT	30
W INNER	30-35 FT	30

NOTES: Non-reserve.
W: Outer is boulder field with sand channels. Inner/Mid follow depth contour
E: Outer is KFM site. Inner is often deeper than Mid and sits on edge of sand channel. Mids are on high relief reef offshore of anchor point.

Reef Check Site "Johnson's Lee" 33°53.824' N, 120°6.407' W

SOUTH POINT

W	33° 53.750' N	120° 07.493' W
E OUTER	33° 53.494' N	120° 07.152' W
E MID/INNER	33° 53.546' N	120° 07.063' W



E OUTER	50-55 FT	120
E MID	25-35 FT	120
E INNER	25-30 FT	120
W OUTER	40-50 FT	120
W MID	35-40 FT	120
W INNER	20-30 FT	120

NOTES: Inside South Point SMR, no take.
W: Outer is boulders with sand channels. Inner/Mid swim inshore, plenty of reef.
E: Outer is high relief and patchy. Outer is offshore of a sand channel. Inner/Mid is more rock habitat to west, some thin strips of reef.

CLUSTER POINT

N OUTER	33° 55.900' N	120° 11.845' W
N MID/INNER	33° 56.030' N	120° 11.317' W
S OUTER	33° 55.430' N	120° 11.520' W
S MID/INNER	33° 55.607' N	120° 11.129' W

N OUTER	60-70 FT	150
N MID	35-45 FT	150
N INNER	20-30 FT	150
S OUTER	50-60 FT	150
S MID	30-40 FT	150
S INNER	25-35 FT	150

NOTES: Non-reserve.
N: Outer is high relief and deep. Anchor in sand inshore of reef. Inners are on inside edge of reef, mids offshore of that.
S: Outer is high relief and deep. Anchor in sand inshore of reef. Inners are on inside edge of reef, mids offshore of that.


SAN MIGUEL ISLAND
N
HARRIS PT. RESERVE
CUYLER
TYLER BIGHT
CROOK POINT

CUYLER

E OUTER	34° 03.103' N	120° 20.771' W
E MID	34° 03.016' N	120° 20.752' W
E INNER	34° 02.961' N	120° 20.659' W
W OUTER	34° 03.423' N	120° 21.156' W
W MID	34° 03.445' N	120° 21.249' W
W INNER	34° 03.453' N	120° 21.304' W

Urchins

West (Inner & Mid)

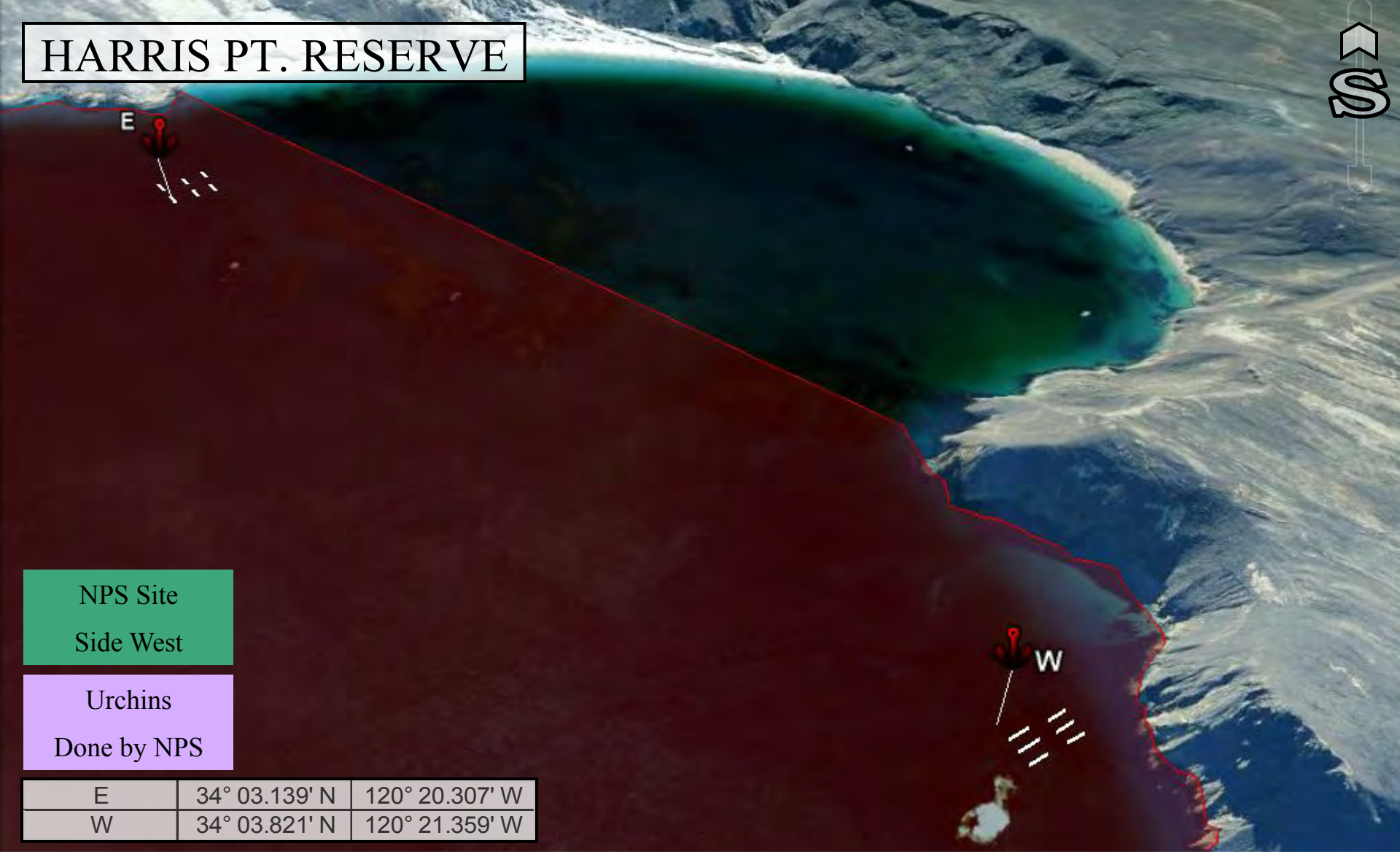
E OUTER	40-45 FT	90
E MID	30-35 FT	90
E INNER	20-25 FT	90
W OUTER	40-45 FT	60
W MID	20-25 FT	60
W INNER	20-25 FT	60

NOTES: Non-reserve.

W: Transects go more east-west. They sit up on a big reef/plateau. Anchor point is located to south of transects/kelp bed.

E: Outer has some high relief, but most is low. Try to find high relief section. Inner/Mid are in separate kelp beds. E Mid swim from eastern edge of kelp bed to the west. Inner, swim from western edge of kelp bed to the east. Inner/Mid are low relief reef

HARRIS PT. RESERVE



NPS Site

Side West

Urchins

Done by NPS

E	34° 03.139' N	120° 20.307' W
W	34° 03.821' N	120° 21.359' W

E OUTER	40-45 FT	140
E MID	30-35 FT	140
E INNER	25-35 FT	140
W OUTER	40-45 FT	60
W MID	25-30 FT	60
W INNER	15-25 FT	60

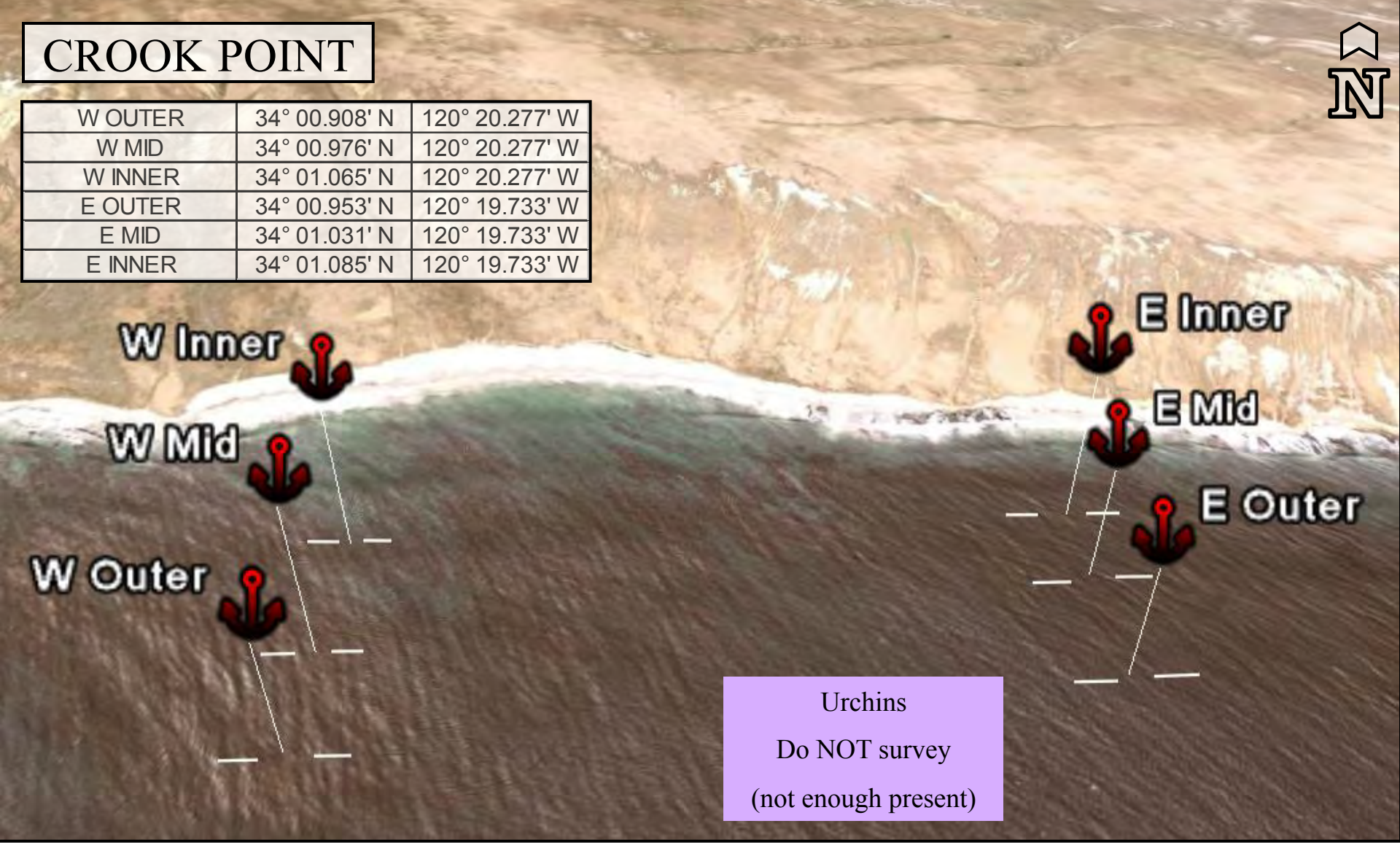
NOTES: Inside Harris Point SMR, no take.

W: Between island and Hare rock. Outers are at base of reef, along edge of kelp. Mid and inners are up on rocky plateau, inners are usually deep in kelp bed.

E: Outer is at base of high relief reef (new numbers are right on the reef), kelp is usually thick and swim from Outer anchor point to Mid/Inner. Inner/Mid in high relief reef. Mid often on top of ridge, with Inners down a little deeper.

CROOK POINT

W OUTER	34° 00.908' N	120° 20.277' W
W MID	34° 00.976' N	120° 20.277' W
W INNER	34° 01.065' N	120° 20.277' W
E OUTER	34° 00.953' N	120° 19.733' W
E MID	34° 01.031' N	120° 19.733' W
E INNER	34° 01.085' N	120° 19.733' W

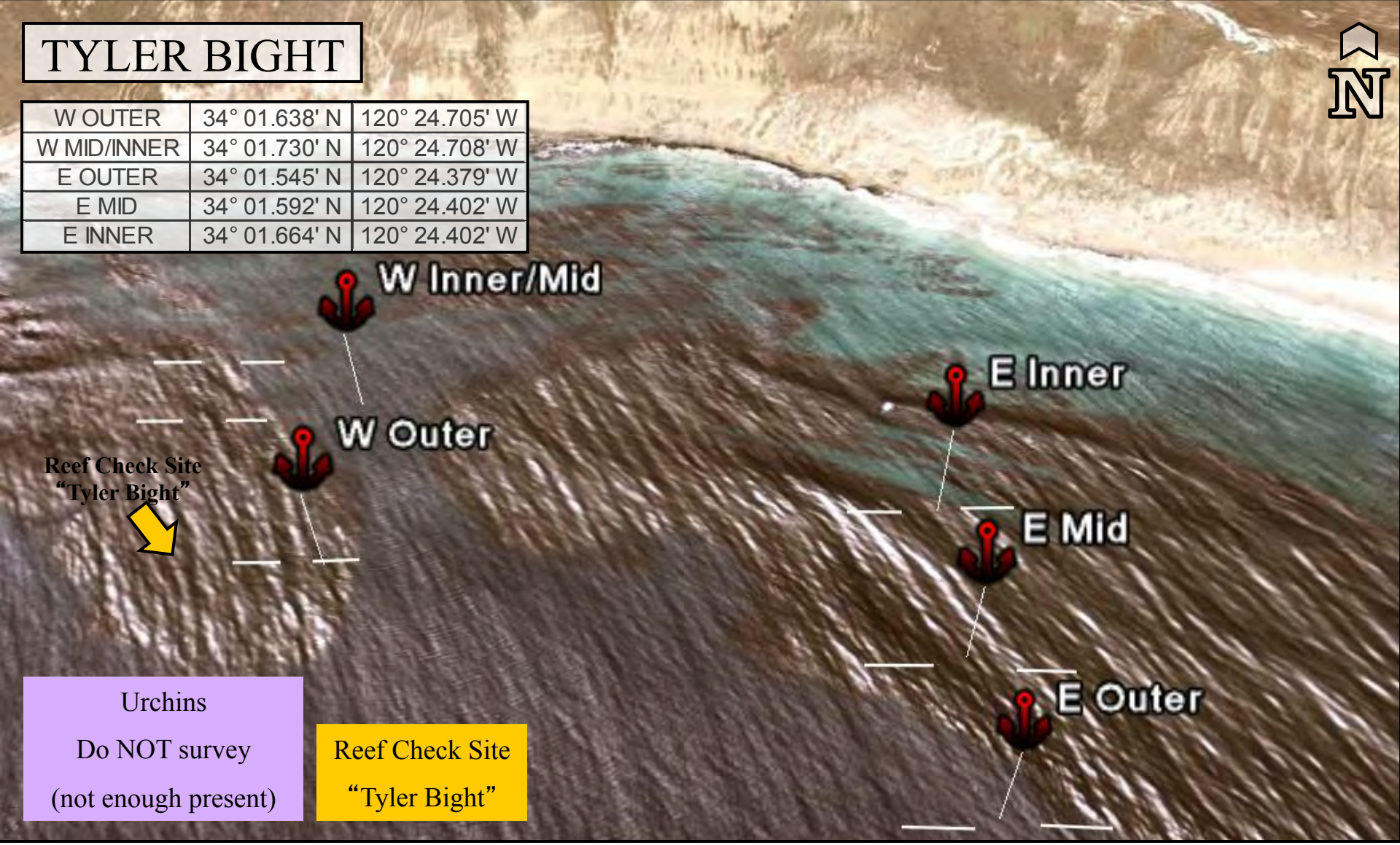


E OUTER	45-50 FT	90
E MID	30-40 FT	90
E INNER	25-30 FT	90
W OUTER	45-55 FT	90
W MID	30-35 FT	90
W INNER	25-30 FT	90

NOTES: Non-reserve.
W: Outer has high relief ledges and big overhangs, find those! W Inner/Mid are patchy low relief reef. Easily stirred up.
E: Outer is flat, low relief Laminaria graveyard. Inner/Mid are also low relief, with some low ledges/ cracks.

TYLER BIGHT

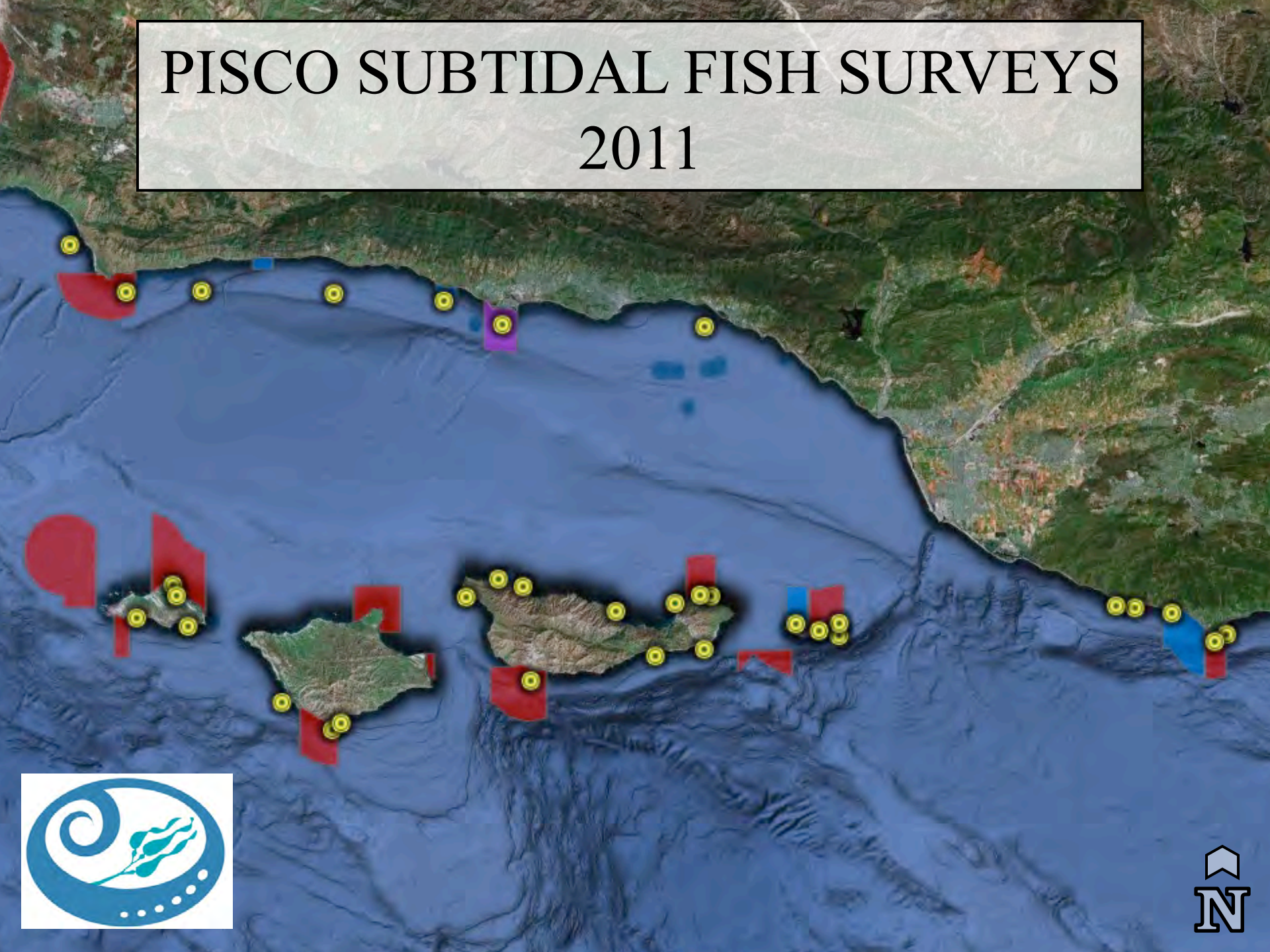
W OUTER	34° 01.638' N	120° 24.705' W
W MID/INNER	34° 01.730' N	120° 24.708' W
E OUTER	34° 01.545' N	120° 24.379' W
E MID	34° 01.592' N	120° 24.402' W
E INNER	34° 01.664' N	120° 24.402' W



E OUTER	45-55 FT	90
E MID	35-45 FT	90
E INNER	15-20 FT	90
W OUTER	45-55 FT	90
W MID	35-40 FT	90
W INNER	25-35 FT	90

NOTES: Non-reserve.
W: Outer crazy high relief, stay west of sand channel on eastern edge of kelp bed. Inner/Mid have plenty of reef, more low relief with some boulder, swim to west from anchor into kelp bed.
E: Outers are mostly continuous rock with sand offshore. Kelp is usually very thick, swim inshore to appropriate depth. Inner/Mid have high relief, some big ledges. All anchor points are center points, run one tx. each way.
Reef Check Site "Tyler Bight" 34°1.644' N, 120°24.840' W

PISCO SUBTIDAL FISH SURVEYS 2011




MAINLAND
N
NAPLES
JALAMA
IV REEF
HORSESHOE REEF
COJO
ARROYO QUEMADO
BULLITO
COUNTY LINE
LITTLE DUME
LEO CARRILLO
POINT DUME
EL MATADOR

JALAMA

N OUTER/OUTMID	34° 29.217' N	120° 29.970' W
N INNER/INMID	34° 29.350' N	120° 29.742' W
S OUTER/OUTMID	34° 28.896' N	120° 29.670' W
S INNER/INMID	34° 28.982' N	120° 29.447' W

N OUTER	55-65 FT	120	S OUTER	60-70 FT	120
N OUTMID	40-45 FT	120	S OUTMID	55-60 FT	120
N INMID	35-45 FT	120	S INMID	40-45 FT	120
N INNER	25-35 FT	120	S INNER	25-35 FT	120

NOTES: Non-Reserve

Low relief. Plenty of reef – contiguous. Sand channel between two sides. When there is a lot of kelp, may have to anchor in sand channel and run transects all in one direction. Must survey at anchor points, which means a surface swim if there is a lot of kelp. Inners can be patchy and stirred up. May need to anchor inside of kelp bed for inners/inmids.

N: Inners and inmids have more reef to the north than to the south of the numbers.

S: Inners run along thin reef strip about 50m inshore of kelp bed.

COJO

W OUTER/OUTMID	34° 26.593' N	120° 25.340' W
W INNER/INMID	34° 26.807' N	120.25.360' W
E OUTER/OUTMID	34° 26.482' N	120° 24.954' W
E INNER/INMID	34° 26.749' N	120° 25.031' W

W OUTER	45-55 FT	90	E OUTER	50-55 FT	90
W OUTMID	40-50 FT	90	E OUTMID	40-50 FT	90
W INMID	25-35 FT	90	E INMID	25-35 FT	90
W INNER	20-25 FT	90	E INNER	20-30 FT	90

NOTES: Site straddles Pt. Conception SMR boundary. No-take within SMR.

Large sand channel between the two sides. May need to anchor on one end of side and run transects in one direction due to large kelp bed. Low relief bedrock, easily stirred up.

BULLITO

CEN OUTER/OUTMID	34° 27.326' N	120° 19.923' W
CEN INNER/INMID	34° 27.490' N	120° 19.894' W

CEN OUTER	40-42 FT	240
CEN OUTMID	35-40 FT	240
CEN INMID	25-30 FT	240
CEN INNER	15-20 FT	240

NOTES: Non-Reserve

This is a half site (side CEN). Also an LTER site.

Run transects to the west from the anchor points. Outside edge of reef is super flat shale transitioning to sand

ARROYO QUEMADO

W OUTER/OUTMID	34° 28.101' N	120° 07.511' W
W INNER/INMID	34° 28.186' N	120° 07.513' W
E OUTER/OUTMID	34° 27.977' N	120° 07.018' W
E INNER/INMID	34° 28.050' N	120° 07.030' W

W OUTER	45-50 FT	70	E OUTER	40-50 FT	70
W OUTMID	35-40 FT	70	E OUTMID	35-40 FT	70
W INMID	25-30 FT	70	E INMID	25-30 FT	70
W INNER	20-25 FT	70	E INNER	15-20 FT	70

NOTES: Non-Reserve

All zones have good, low relief reef except inners which are patchy. Flat bedrock with some low ledges.

W: Added anchor point for inner/inmid for use with small boats, but can swim to all zones from outer anchor spot if need be. Run transects to the west from anchor point. Outmid/Inmid transects start ~20m west of anchor.

E: Sandy channel to the west of transects, make sure to start far enough to the east. Anchor points are the center of the site.

NAPLES

W OUTER/INNER	34° 25.478' N	119° 57.319' W
CEN OUTER/INNER	34° 25.311' N	119° 57.090' W
E OUTER/INNER	34° 25.400' N	119° 57.061' W

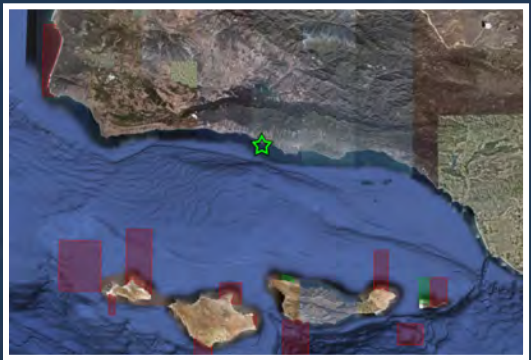
West Inner/Outer

East Outer/Inner

Central Outer/Inner

Reef Check Site
"Naples Reef"

Reef Check Site
"Naples Reef"



E OUTER	40-45 FT	90
E INNER	40-50 FT	90
CEN OUTER	45-55 FT	90
CEN INNER	30-40 FT	90
W OUTER	40-45 FT	90
W INNER	30-40 FT	90

NOTES: *Inside Naples SMCA, all take prohibited except pelagic finfish by spear and commercial kelp harvest.*

It is possible to anchor between E and CEN in a large boat and swim to the spots.
CEN: Is "Three Fingers" - Run inners along the top of the ridge and outers along the offshore down-slope.
E: Is "Main Naples" - Inners and outers are run at similar depths. Reef has some ridges.
W: Is "Little Naples." More reef to the east of the anchor point. Reef is flat, shaley, with low ridges. There is a higher ridge that comes up to ~30'. Run inners along that and outers to the North (deeper). Run all transects to the east.
Reef Check Site "Naples Reef" 34°25.311' N, 119°57.090' W (Same as our side CEN numbers.)

IV REEF

W INNER/INMID	34° 24.284' N	119° 52.577' W
W OUTER/OUTMID	34° 24.213' N	119° 52.612, W
E OUTER/OUTMID	34° 24.177' N	119° 51.871, W
E INNER/INMID	34° 24.292' N	119° 51.840' W

W OUTER	30-40 FT	60
W OUTMID	25-35 FT	60
W INMID	25-30 FT	60
W INNER	20 FT	60

E OUTER	35-40 FT	90
E OUTMID	35-40 FT	90
E INMID	25-30 FT	90
E INNER	15-20 FT	90

NOTES: Inside Campus Point SMCA, No-Take

E: Reef varies from medium to no relief. Flattens out toward the east so run transects to the west.

W: Transects run East from the point. All zones shallow towards the point and get deeper towards the East. Outer anchor point for outers, swim in for outmids. No reef less than ~20' depth.

HORSESHOE REEF

W OUTER/OUTMID	34° 23.504' N	119° 33.462' W
W INNER/INMID	34° 23.652' N	119° 33.612' W
E OUTER/OUTMID	34° 23.367' N	119° 32.686' W
E INNER/INMID	34° 23.452' N	119° 32.473' W

W OUTER	40-45 FT	60
W OUTMID	35-40 FT	60
W INMID	30-35 FT	60
W INNER	25-30 FT	60

E OUTER	30-35 FT	90
E OUTMID	25-30 FT	90
E INMID	20-25 FT	90
E INNER	15-20 FT	90

NOTES: Non-Reserve

E: Run all transects to the East from anchor. Mid/Inner anchor point is over the mids, swim in for the inners.

W: Numbers are center points.

COUNTY LINE

CEN OUTER/OUTMID	34° 02.615' N	118° 57.141' W
CEN INNER/INMID	34° 02.664' N	118° 57.120' W

OUTER	38-40 FT	90
OUTMID	34-36 FT	90
INMID	20-25 FT	90
W INNER	15-20 FT	90

NOTES: Non-Reserve
Outer/Outmids: There are a few sand channels to navigate around. Run all transects to the west from the anchor.
Inmids: anchor spot for Inner/Inmid is perfect depth for inmid transects

LEO CARRILLO

CEN OUTER/OUTMID	34° 02.257' N	118° 55.319' W
CEN INNER/INMID	34° 02.557' N	118° 55.424' W

OUTER	45-50 ft	90
OUTMID	40-45 ft	90
INMID	25-35 ft	90
INNER	15-20 ft	90

NOTES: Non-Reserve
OUTER/OUTMID: Run transects to West. Large oval shaped reef comes up to ~40’ in center.
INNER/INMID: Inners and inmids are separated by sand. Swim offshore of anchor point to inmids and inshore for inners.

EL MATADOR

CEN OUTER/OUTMID	34° 01.997' N	118° 52.210' W
CEN INNER/INMID	34° 02.113' N	118° 52.286' W

OUTER	35-40 ft	90
OUTMID	30-40 ft	90
INMID	20-25 ft	90
INNER	15-20 ft	90

NOTES: Inside Point Dume SMCA, all take prohibited excep recreational take of pelagic finfish by spear and commercial take of coastal pelagic species by round haul net and swordfish by harpoon.
OUTER/OUTMID: Run transects to East. Run outers on offshore edge of reef, move across to inshore side of reef for outmids
INNER/INMID: Run transects to East.

POINT DUME

CEN OUTER/OUTMID	33° 59.912' N	118° 48.338' W
CEN INNER/INMID	33° 59.962' N	118° 48.273' W

CEN OUTER	35 ft	20
CEN OUTMID	25 ft	20
CEN INMID	20 ft	60
CEN INNER	15-18 ft	60

NOTES: Inside new Point Dume SMR, No take
CEN: INNERs are to the North against the point in the surfgrass. OUTER/OUTMID/INMID are out off of the point in front of the wash rocks.

LITTLE DUME

CEN OUTER/OUTMID	34° 00.295' N	118° 47.347' W
CEN INNER/INMID	34° 00.368' N	118° 47.487' W

CEN OUTER	38-43 ft	40
CEN OUTMID	38-43 ft	40
CEN INMID	25-30 ft	40
CEN INNER	15-20 ft	40

NOTES: Inside new Point Dume SMR, No take
Run transects to East of anchor points.
OUTER/OUTMID anchor point is in ~40ft. Reef gets slightly deeper to the East.
Outers are slightly offshore, and Inmids slightly inshore from OUTER/OUTMID anchor point.
Inners are slightly inshore and Inmids are slightly offshore of INNER/INMID anchor point.

SANTA CRUZ ISLAND

VALLEY

E	33° 59.013' N	119° 37.219' W
CEN	33° 59.017' N	119° 38.304' W
W	33° 58.853' N	119° 40.028' W

E OUTER	30-35 FT	90
E INNER	25-30 FT	90
CEN OUTER	40-45 FT	90
CEN INNER	20-25 FT	90
W OUTER	35-40 FT	90
W INNER	15-20 FT	90

NOTES:

W: Run transects to the east. Inners are close to wash rock and can be very surgy. Can swim in for inners.

CEN: Run Transects to the West. Reef is patchy, but some large parts. Can move slightly in/off shore to find more strips. Will silt out on south swell. Cannot swim in for inners

E: Run transects to the west. Rather cobbly flat and patchy reef. Usually kelp on inners. Cannot swim in for inners.

YELLOWBANKS

W OUTER/OUTMID	33° 59.358' N	119° 33.896' W
W INNER/INMID	33° 59.519' N	119° 34.045' W
CEN OUTER/OUTMID	33° 59.312' N	119° 32.819' W
CEN INNER/INMID	33° 59.546' N	119° 33.268' W

W OUTER	60-65 FT	90
W OUTMID	45-50 FT	90
W INMID	35-40 FT	90
W INNER	25-30 FT	90

CEN OUTER	50-60 FT	100
CEN OUTMID	45-50 FT	100
CEN INMID	30-35 FT	100
CEN INNER	25-30 FT	100

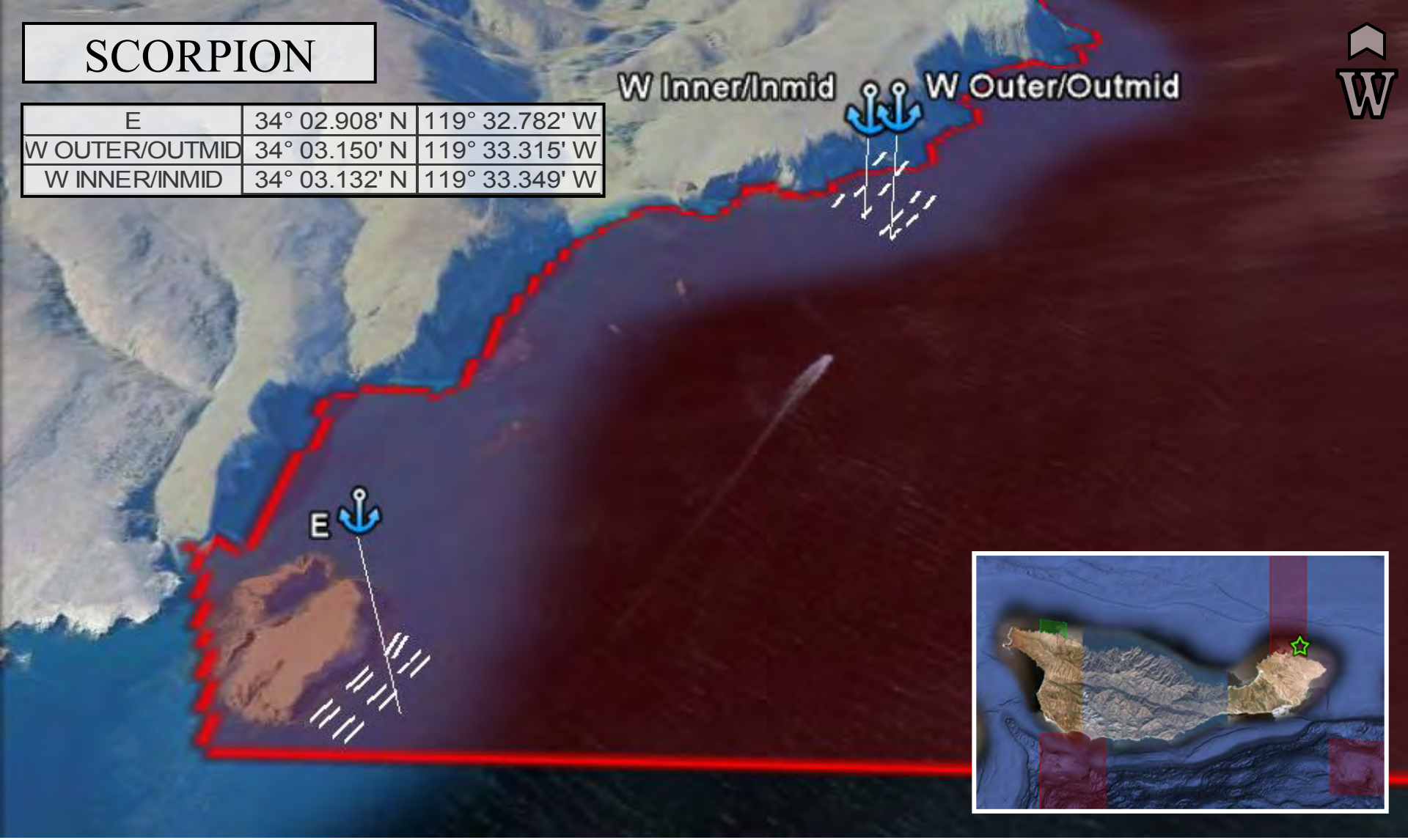
NOTES:

W and CEN are the two sides of this site. There is no E. Varied substrate over site. Each zone can be very different.

W: Inner/mid anchor point is good for Inmids. Swim in for inners.

SCORPION

E	34° 02.908' N	119° 32.782' W
W OUTER/OUTMID	34° 03.150' N	119° 33.315' W
W INNER/INMID	34° 03.132' N	119° 33.349' W



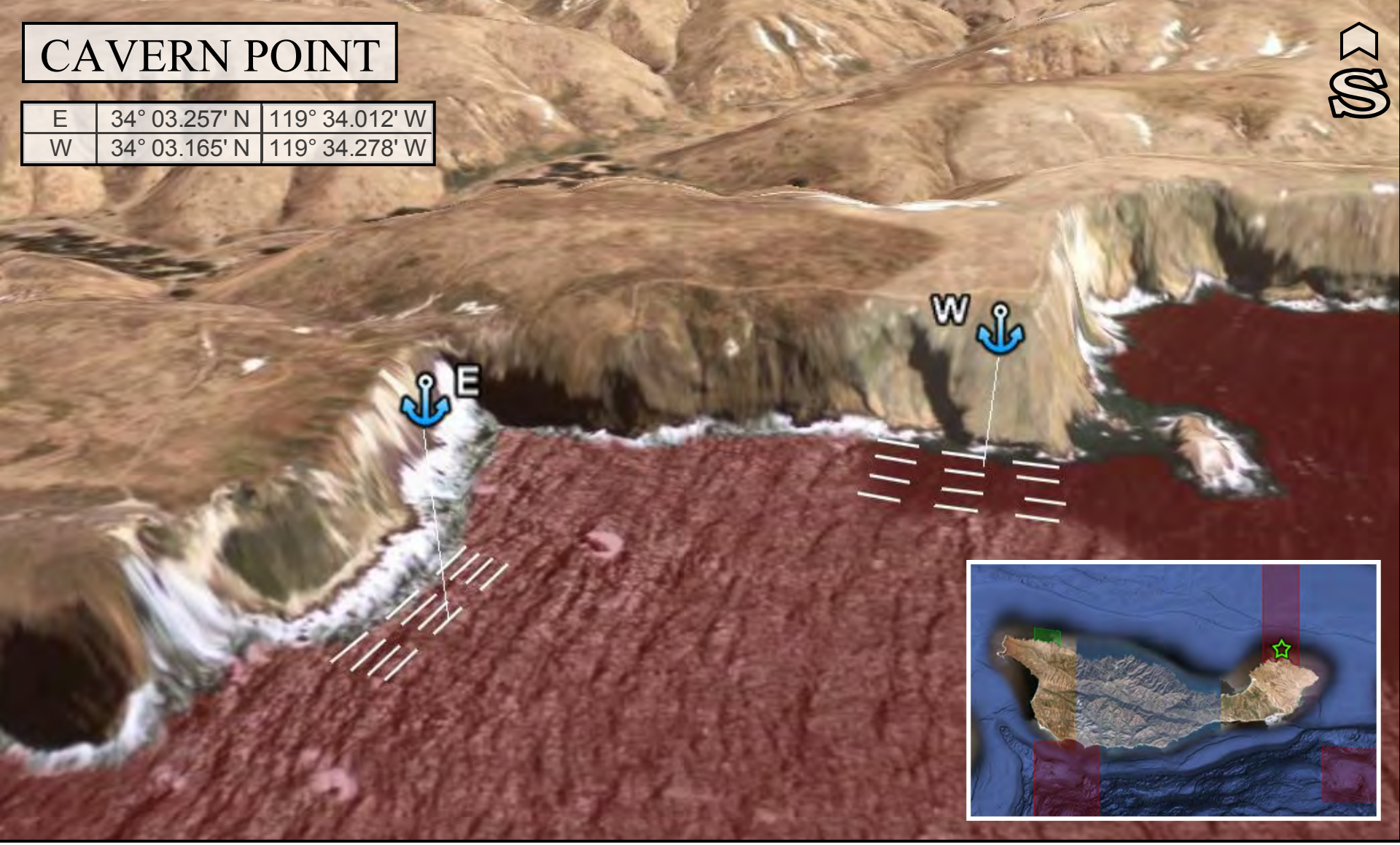
E OUTER	55-65 FT	120
E OUTMID	45-55 FT	120
E INMID	30-35 FT	120
E INNER	15-20 FT	120

W OUTER	38-40 FT	120
W OUTMID	35 FT	120
W INMID	30-35 FT	120
W INNER	15-20 FT	120

NOTES: **Inside Reserve*
W: Outers patchy, hard to find reef. Reef is under anchor point.
E: Inners are up on the wall. Inmids are slightly offshore of rock on raised section of reef. Outers/Outmids are deep.

CAVERN POINT

E	34° 03.257' N	119° 34.012' W
W	34° 03.165' N	119° 34.278' W



E OUTER	50-60 FT	30	W OUTER	40 FT	120
E OUTMID	40-45 FT	30	W OUTMID	30-35 FT	120
E INMID	25-30 FT	30	W INMID	20-30 FT	120
E INNER	15-20 FT	30	W INNER	15-20 FT	120

NOTES: **Inside Reserve*

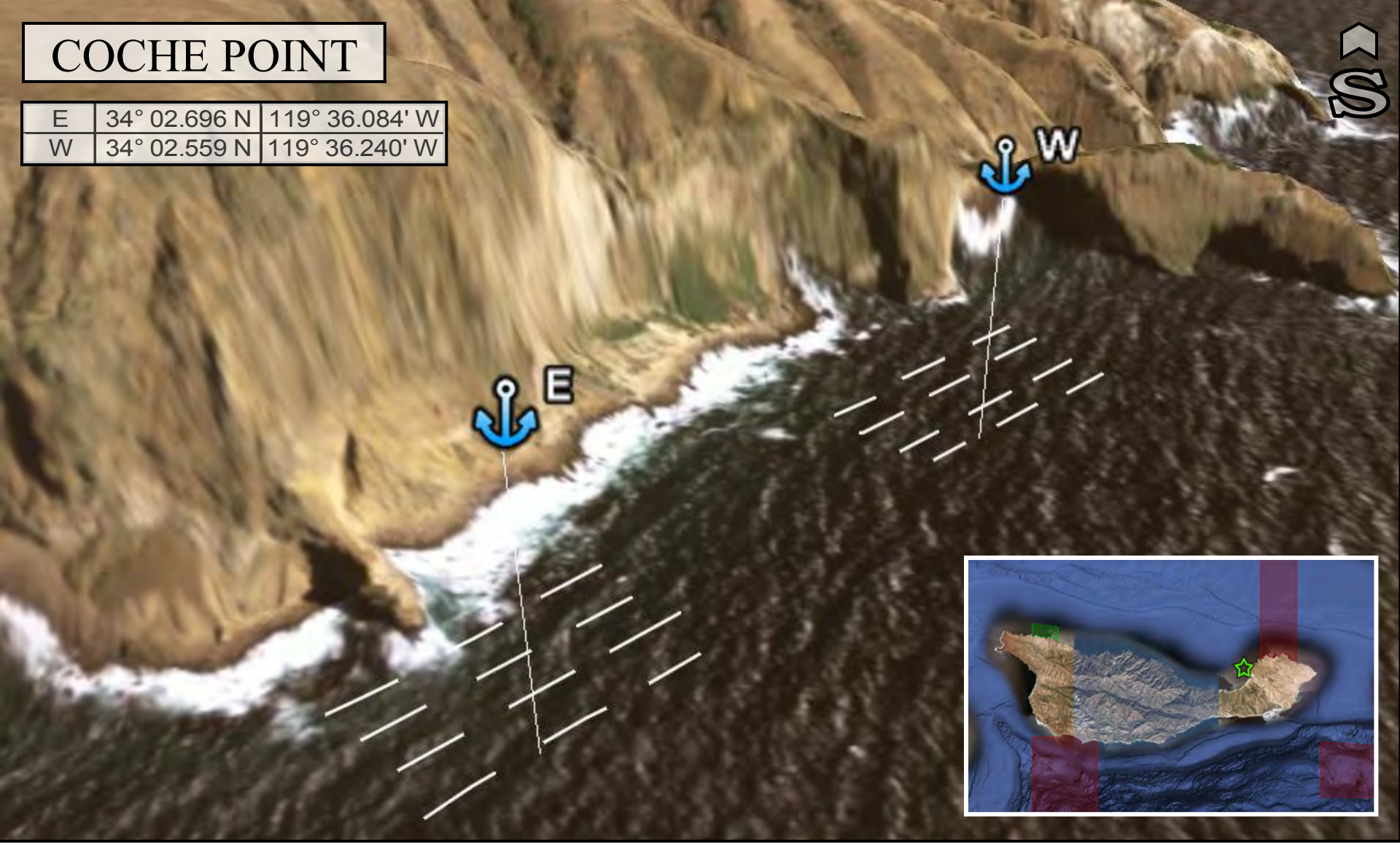
Whole site is very exposed to W swell.

W: Reef does not extend very far offshore. Midpoint is small point jutting out.

E: Has extensive high relief reef. Big washrock to the north of anchor point. Run transects to the south of the point on coastline that bends inward. Has permanent KFM transect.

COCHE POINT

E	34° 02.696 N	119° 36.084' W
W	34° 02.559 N	119° 36.240' W



E OUTER	50-60 FT	30	W OUTER	50-60 FT	30
E OUTMID	40-45 FT	30	W OUTMID	40-45 FT	30
E INMID	30-35 FT	30	W INMID	30-35 FT	30
E INNER	15-25 FT	30	W INNER	15-25 FT	30

NOTES:

E: Midpoint is the part of the cliff that juts out. Has permanent KFM transects.

W: Outers are mostly to the east of the anchor point. Otherwise has extensive reef.

PELICAN

E	34° 01.683' N	119° 41.455' W
CEN	34° 01.839' N	119° 41.799' W
W	34° 02.152' N	119° 42.138' W

E OUTER	30-40 FT	140
E INNER	20-25 FT	140
CEN OUTER	30-45 FT	120
CEN INNER	15-25 FT	120
W OUTER	35-40 FT	30
W INNER	15-25 FT	30

NOTES:

W: Midpoint is where rock face changes from white to black.

CEN: Midpoint is large crack in cliff face. This site has a large cobble channel running perpendicular to the coastline. Avoid laying transects on it.

E: Midpoint is largest rock at base of rockslide.

HAZARDS

E	34° 03.263' N	119° 49.161' W
CEN	34° 03.395' N	119° 49.270' W
W	34° 03.486' N	119° 49.490' W

E OUTER	30-45 FT	120
E INNER	20-25 FT	120
CEN OUTER	45-55 FT	120
CEN INNER	15-25 FT	120
W OUTER	35-50 FT	80/0
W INNER	15-25 FT	80/0

NOTES:

W: Transect 1 and 2 outers at base of wall, inners on top of shelf above wall. Run transects from cave to the east, do not run into cave. Edge of reef gets shallower in the interior of the cove so those outers (2&3) will be shallower than the others.

CEN: Midpoint is the washrock that juts the farthest out from the island.

E: Midpoint is large phallic rock. Reef doesn't extend very far offshore. Transects angle slightly around contours of reef to maintain a constant depth. Edge of the reef is shallower on the east side of the midpoint.

PAINTED CAVE

E	34° 04.314' N	119° 51.453' W
CEN	34° 04.372' N	119° 52.259' W
W	34° 04.469' N	119° 52.928' W

E OUTER	40-50 FT	90/30
E INNER	20-25 FT	90/30
CEN OUTER	40-55 FT	120
CEN INNER	20-25 FT	120
W OUTER	40-50 FT	160
W INNER	20-25 FT	160

NOTES: **Inside Reserve (State Marine Conservation Area)*

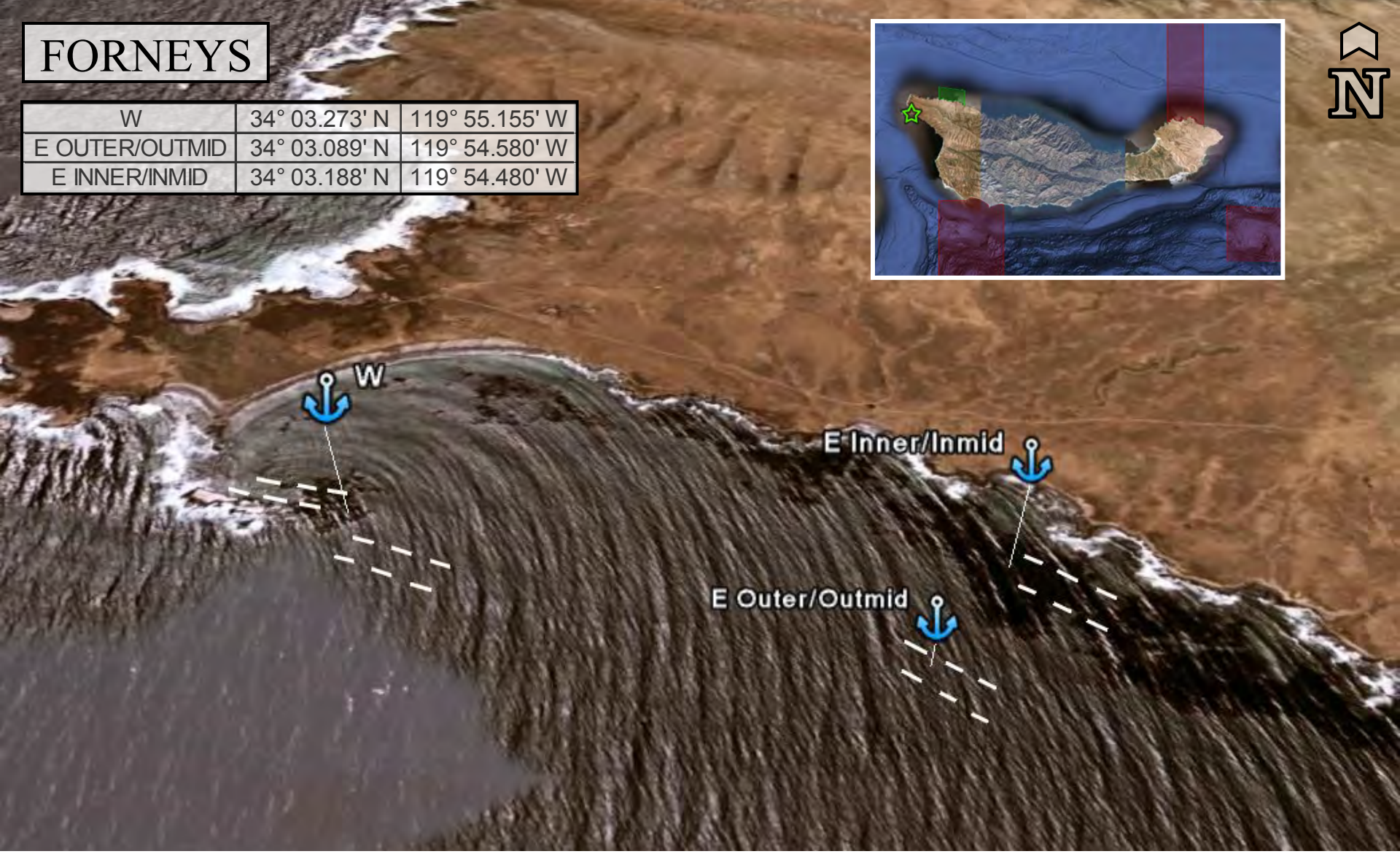
E: Has plenty of reef that drops steeply and extends deeper than deepest transects. Midpoint of E side is a rocky protuberance that is to the east of a cave. Transect 1 runs along main wall, transect 2 runs in toward the cave.

CEN: Midpoint is crack in cliff-face.

W: Midpoint is a bend in the shoreline.

FORNEYS

W	34° 03.273' N	119° 55.155' W
E OUTER/OUTMID	34° 03.089' N	119° 54.580' W
E INNER/INMID	34° 03.188' N	119° 54.480' W



W OUTER	35-40 FT	120	E OUTER	45-55 FT	120
W OUTMID	30-35 FT	120	E OUTMID	35-45 FT	120
W INMID	25-35 FT	120	E INMID	25-30 FT	120
W INNER	15-20 FT	120	E INNER	15-20 FT	120

NOTES:

W: Inners/Inmids swim toward the point and run all transects to the west along the rocky point. Outers/Outmids swim out from anchor point and run transects as shown. Outers along reef edge, outmids slightly shallower (to SW)

E: Anchor on the numbers at the edge of kelp and run transects to the east. There are rocky outcropping along the shore which you should be parallel to.

GULL ISLAND

W OUTER/OUTMID	33° 56.890' N	119° 49.677' W
W INNER/INMID	33° 56.915' N	119° 49.582' W
E OUTER/OUTMID	33° 56.788' N	119° 49.391' W
E INNER/INMID	33° 56.969' N	119° 49.377' W

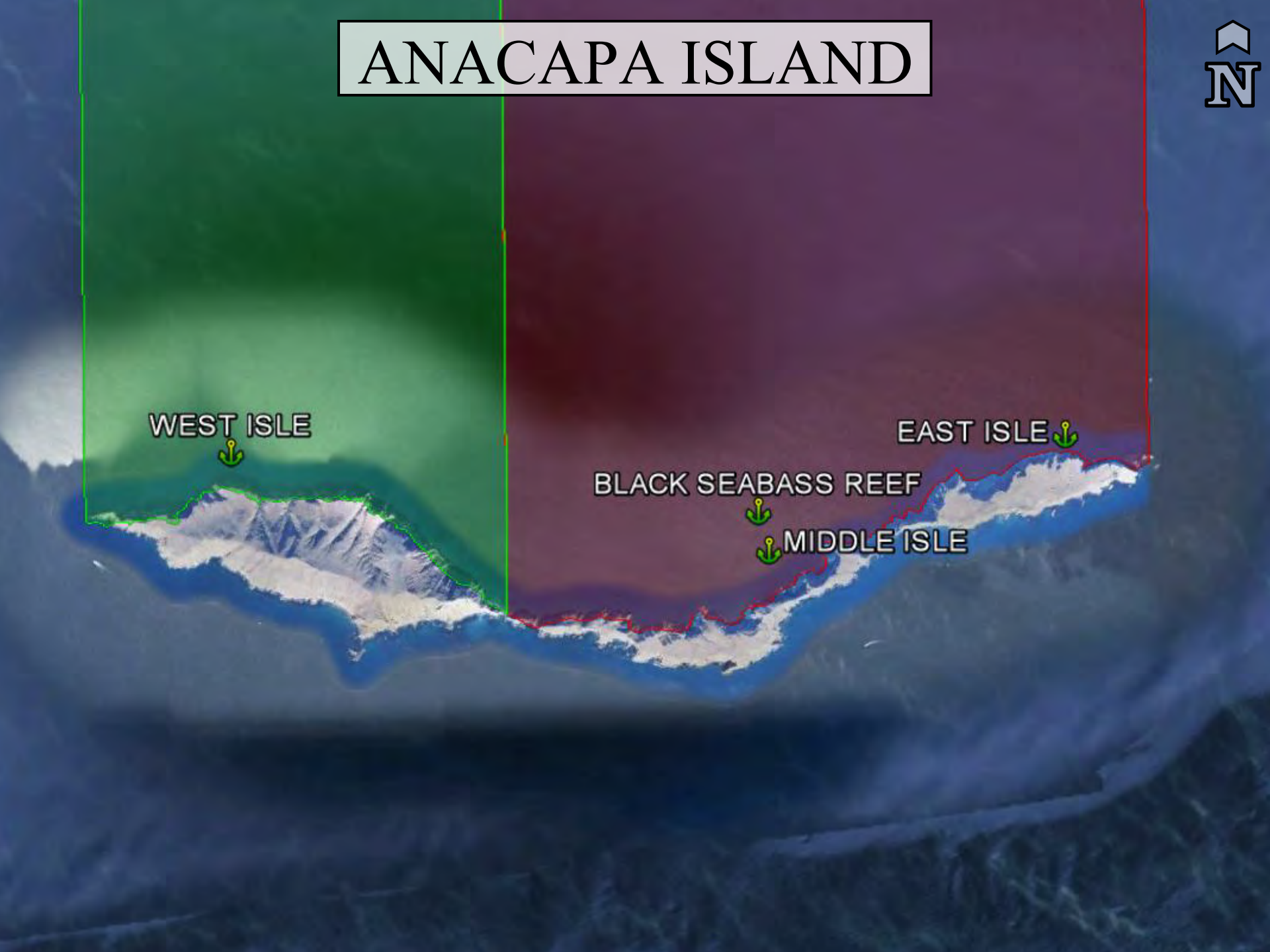
E OUTER	55-65 FT	40	W OUTER	60-65 FT	120
E OUTMID	40-50 FT	40	W OUTMID	40-45 FT	120
E INMID	25-35 FT	40	W INMID	30-35 FT	120
E INNER	20-30 FT	40	W INNER	15-25 FT	120

NOTES:

Lots of current. Always.

E: Outers are along a steep drop off near to anchor point. Hard to keep a constant depth contour and heading simultaneously because reef rises and falls. Use a general heading but alter between/within transects. Inners/inmids has a shallow spot that will break with S swell.

W: Has high relief, follow depth contour.


ANACAPA ISLAND
N
WEST ISLE
EAST ISLE
BLACK SEABASS REEF
MIDDLE ISLE

WEST ISLE

E OUTER/INNER	34° 00.975' N	119° 25.305' W
CEN OUTER/INNER	34° 01.020' N	119° 25.974' W
W OUTER	34° 01.053' N	119° 26.275' W
W INNER	34° 00.922' N	119° 26.426' W

E OUTER	30-40 FT	90
E INNER	20-25 FT	90
CEN OUTER	35-45 FT	90
CEN INNER	15-20 FT	90
W OUTER	80-90 FT	90
W INNER	25-35 FT	90

NOTES: *Inside Conservation Area*

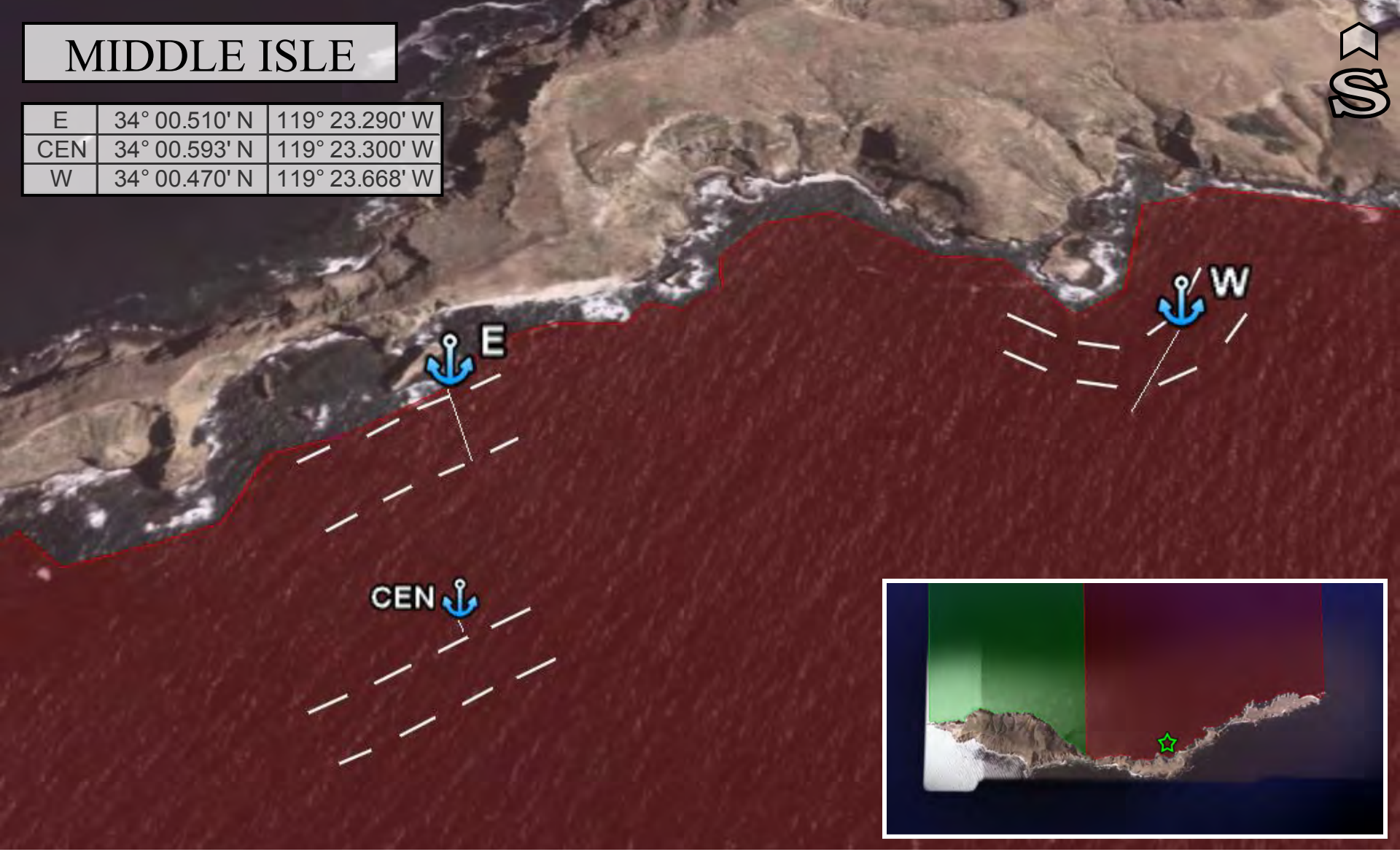
W: Outers are very deep right below anchor point. Small section of reef. May need to put run transects parallel to each other to fit on reef. More reef to the west of the point. Midpoint of inners is a large cave.

E: Midpoint is large, tall rock.

CEN: Transects run on wall, midpoint is protuberance.

MIDDLE ISLE

E	34° 00.510' N	119° 23.290' W
CEN	34° 00.593' N	119° 23.300' W
W	34° 00.470' N	119° 23.668' W



E OUTER	25-35 FT	60
E INNER	15-20 FT	60
CEN OUTER	35-40 FT	60
CEN INNER	30-35 FT	60
W OUTER	25-35 FT	90
W INNER	15-20 FT	90

NOTES: *Inside Reserve*

W: Transects hug the contours around both sides of the washrock.

CEN: Has more habitat to the east. Possible to for E and CEN to share an anchor point. Anchor point is in sand- you have to swim in to the reef.

EAST ISLE

E OUTER/INNER	34° 01.022' N	119° 21.668' W
CEN OUTER/INNER	34° 01.060' N	119° 21.821' W
W OUTER/INNER	34° 00.952' N	119° 22.304' W

E OUTER	45-50 FT	90/0
E INNER	20-25 FT	90/0
CEN OUTER	40-50 FT	50/340
CEN INNER	20-30 FT	50/340
W OUTER	25-35 FT	90/120
W INNER	15-20 FT	90/120

NOTES:

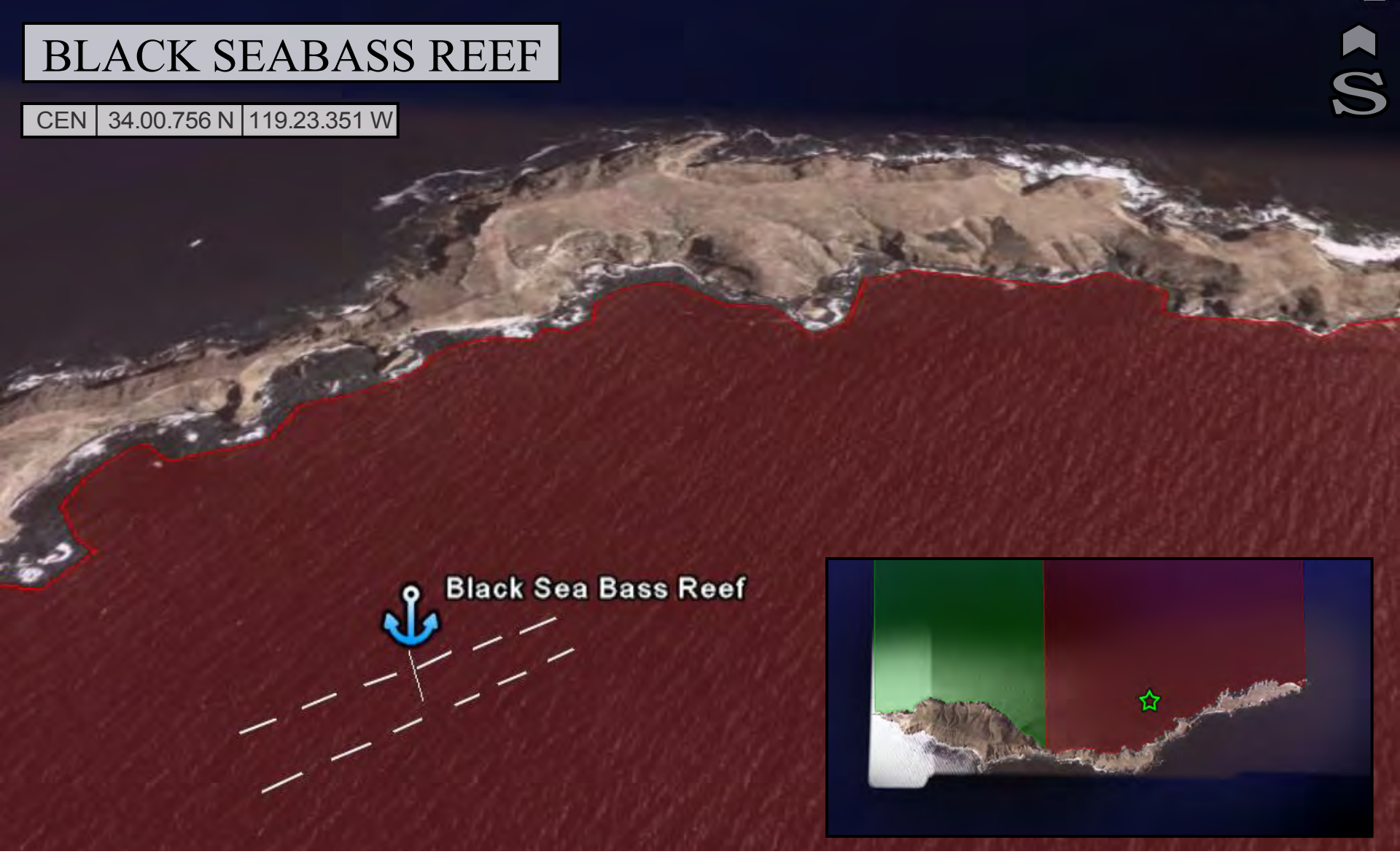
E: Transects run on opposite sides of "Landing Cove" stairs. Inner transect 1 and 2 on wall. Has KFM permanent transect.

CEN: Transects are run on either side of cove. Start transects way out on edges of the cove so that you don't run into eachother at the center.

W: Is "Cathedral Cove." Transect 1 and 2 run offshore of rock, transects 3 and 4 on wall to the west.

BLACK SEABASS REEF

CEN	34.00.756 N	119.23.351 W



CEN OUTER	55-60 FT	60
CEN INNER	60-65 FT	60

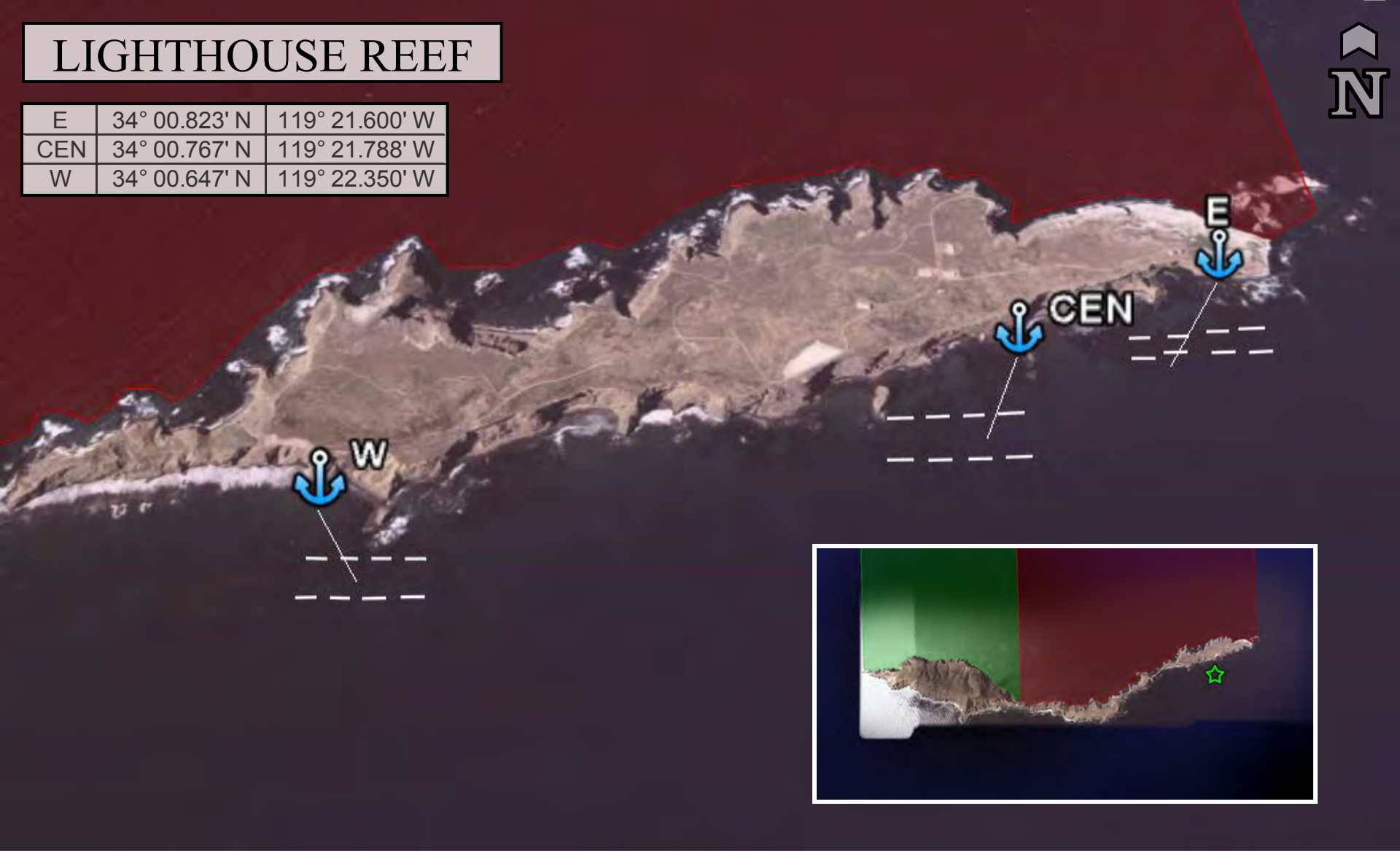
NOTES:

One sided site. Reef perfectly fits transects so start on one edge and work the opposite direction putting only small spaces between transects.

This is a fish survey only site.

LIGHTHOUSE REEF

E	34° 00.823' N	119° 21.600' W
CEN	34° 00.767' N	119° 21.788' W
W	34° 00.647' N	119° 22.350' W



E OUTER	30-35 FT	90
E INNER	15-20 FT	90
CEN OUTER	20-30 FT	90
CEN INNER	15-20 FT	90
W OUTER	35-40 FT	90
W INNER	20-25 FT	90

NOTES:

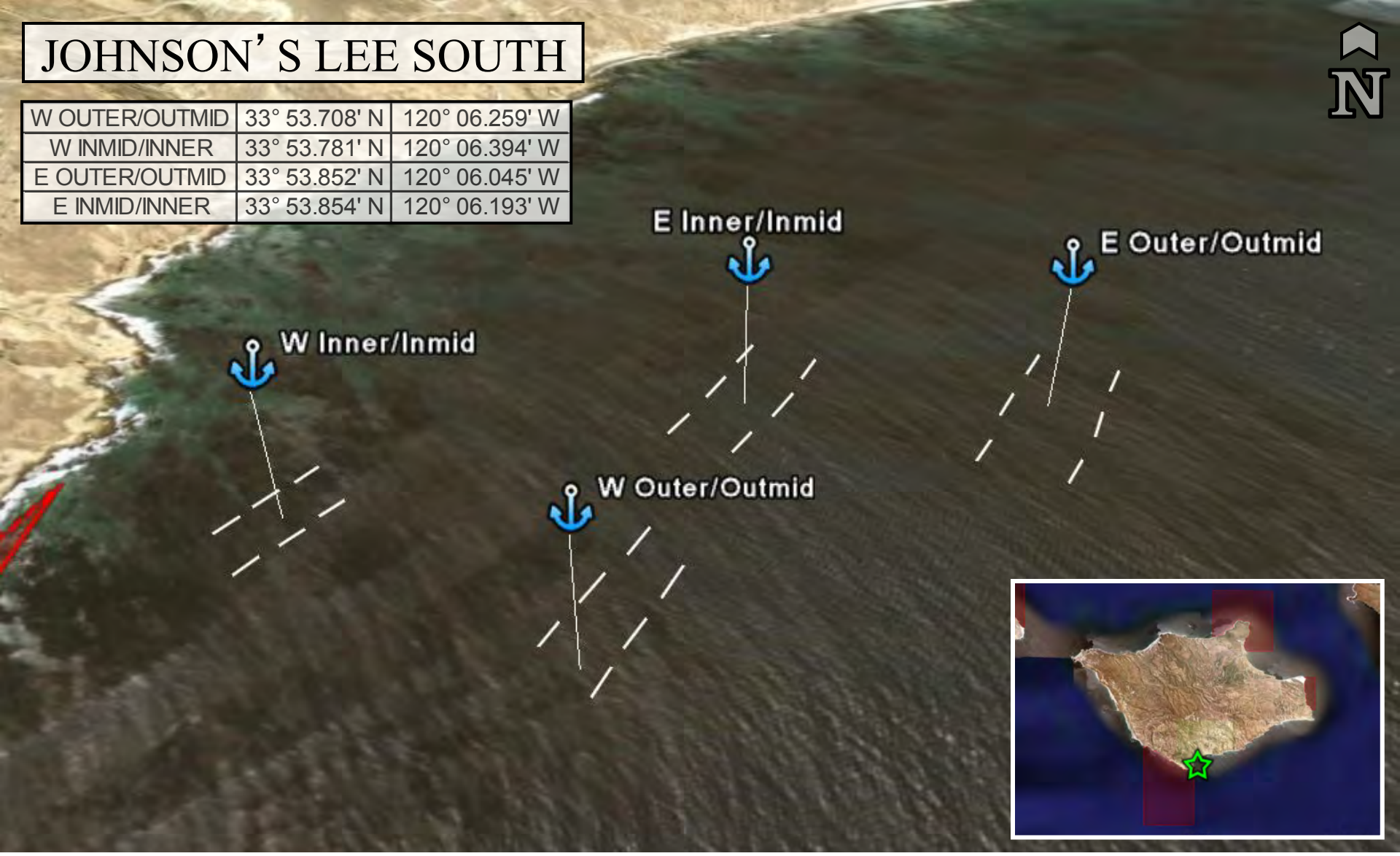
W: Transects 3 and 4 located east of rocky point, transects 1 and 2 run to west.

CEN: Transects located to the east of large rock. Outers are on offshore reef past large sand channel. Anchor point is on part of inner reef which juts out from island.


SANTA ROSA ISLAND
N
CLUSTER POINT
JOHNSONS LEE SOUTH
SOUTH POINT

JOHNSON'S LEE SOUTH

W OUTER/OUTMID	33° 53.708' N	120° 06.259' W
W INMID/INNER	33° 53.781' N	120° 06.394' W
E OUTER/OUTMID	33° 53.852' N	120° 06.045' W
E INMID/INNER	33° 53.854' N	120° 06.193' W



W OUTER	55-60 FT	30
W OUTMID	50-55 FT	30
W INMID	30-40 FT	30
W INNER	25-35 FT	30

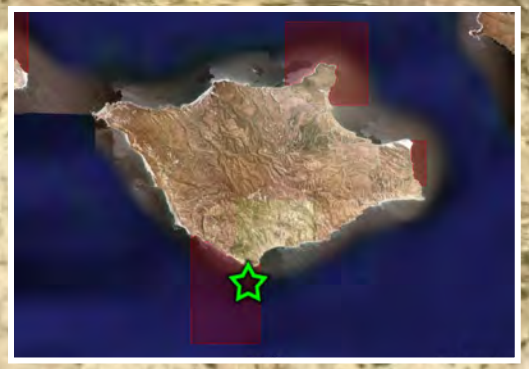
E OUTER	50-55 FT	30
E OUTMID	45-55 FT	30
E INMID	40-50 FT	30
E INNER	45-50 FT	30

NOTES:

W: Outer is boulder field with sand channels. Inner/Inmid follow depth contour.

E: Outer is KFM site. Inner is often deeper than Inmid and sits on edge of sand channel. Inmids are on high relief reef offshore of the anchor point.

SOUTH POINT



W Outer/Outmid

W Inner/Inmid

E Inner/Inmid

E Outer/Outmid

W INNER/INMID	33° 53.724' N	120° 07.495' W
W OUTER/OUTMID	33° 53.665' N	120° 07.512' W
E OUTER/OUTMID	33° 53.494' N	120° 07.152' W
E INMID/INNER	33° 53.546' N	120° 07.063' W

W OUTER	55-65 FT	120
W OUTMID	40-50 FT	120
W INMID	30-40 FT	120
W INNER	25-30 FT	120

E OUTER	50-55 FT	100
E OUTMID	40-50 FT	100
E INMID	30-35 FT	100
E INNER	20-30 FT	100

NOTES: *Inside Reserve*

W: Outer is boulders with sand channels. Inner/Inmid swim inshore, plenty of reef.

E: Outer is high relief and patchy. Outer is offshore of a sand channel. Inner/Inmid more rock habitat to west, some thin strips of reef.

CLUSTER POINT

N OUTER/OUTMID	33° 55.900' N	120° 11.845' W
N INMID/INNER	33° 56.030' N	120° 11.317' W
S OUTER/OUTMID	33° 55.430' N	120° 11.520' W
S INMID/INNER	33° 55.607' N	120° 11.129' W

N OUTER	70-75 FT	120
N OUTMID	60-65 FT	120
N INMID	30-35 FT	120
N INNER	25-30 FT	120

S OUTER	60-65 FT	120
S OUTMID	50-55 FT	120
S INMID	30-35 FT	120
S INNER	25-30 FT	120

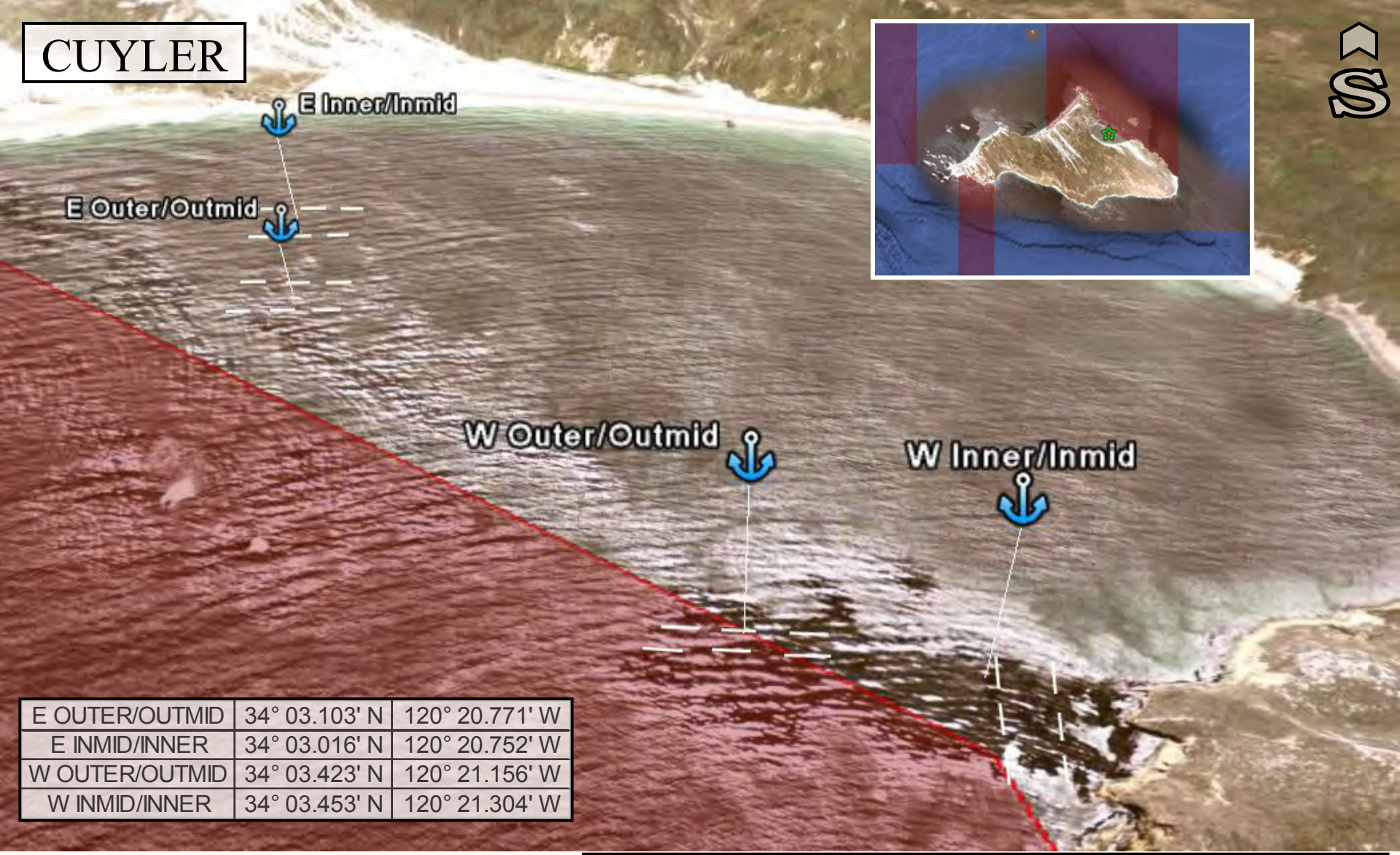
NOTES:

N: Outer is high relief and deep. Anchor in sand inshore of reef. Inners are on inside edge of reef, inmids offshore of that.

S: Outer is high relief and deep. Anchor in sand inshore of reef. High relief reef is to the southwest of anchor point. Inners are on inside edge of reef, inmids offshore of that.


SAN MIGUEL ISLAND
N
HARRIS PT. RESERVE
CUYLER
TYLER BIGHT
CROOK POINT

CUYLER



E OUTER/OUTMID	34° 03.103' N	120° 20.771' W
E INMID/INNER	34° 03.016' N	120° 20.752' W
W OUTER/OUTMID	34° 03.423' N	120° 21.156' W
W INMID/INNER	34° 03.453' N	120° 21.304' W

E OUTER	40-50 FT	90
E OUTMID	35-45 FT	90
E INMID	25-35 FT	90
E INNER	15-25 FT	90

W OUTER	40-50 FT	90
W OUTMID	35-45 FT	90
W INMID	25-35 FT	0
W INNER	15-25 FT	0

NOTES:

W: Outers/outmids go more east-west. They sit up on a big reef/plateau. Anchor point is located to south of transects/kelp bed.

E: Outer has some high relief, but most is low. Try to find high relief section. Inners/inmids are on one large football shaped reef chunk. Run inmids along north edge of the reef and inners along the south edge.

HARRIS PT. RESERVE

E

W

Needs new screenshot with updated numbers

E OUTER/OUTMID	34° 03.153' N	120° 20.319' W
E INMID/INNER	34° 03.113' N	120° 20.331' W
W	34° 03.821' N	120° 21.359' W

E OUTER	45-55 FT	140
E OUTMID	35-40 FT	140
E INMID	35-40 FT	140
E INNER	30-35 FT	140

W OUTER	30-35 FT	60
W OUTMID	25-30 FT	60
W INMID	20-25 FT	60
W INNER	15-20 FT	60

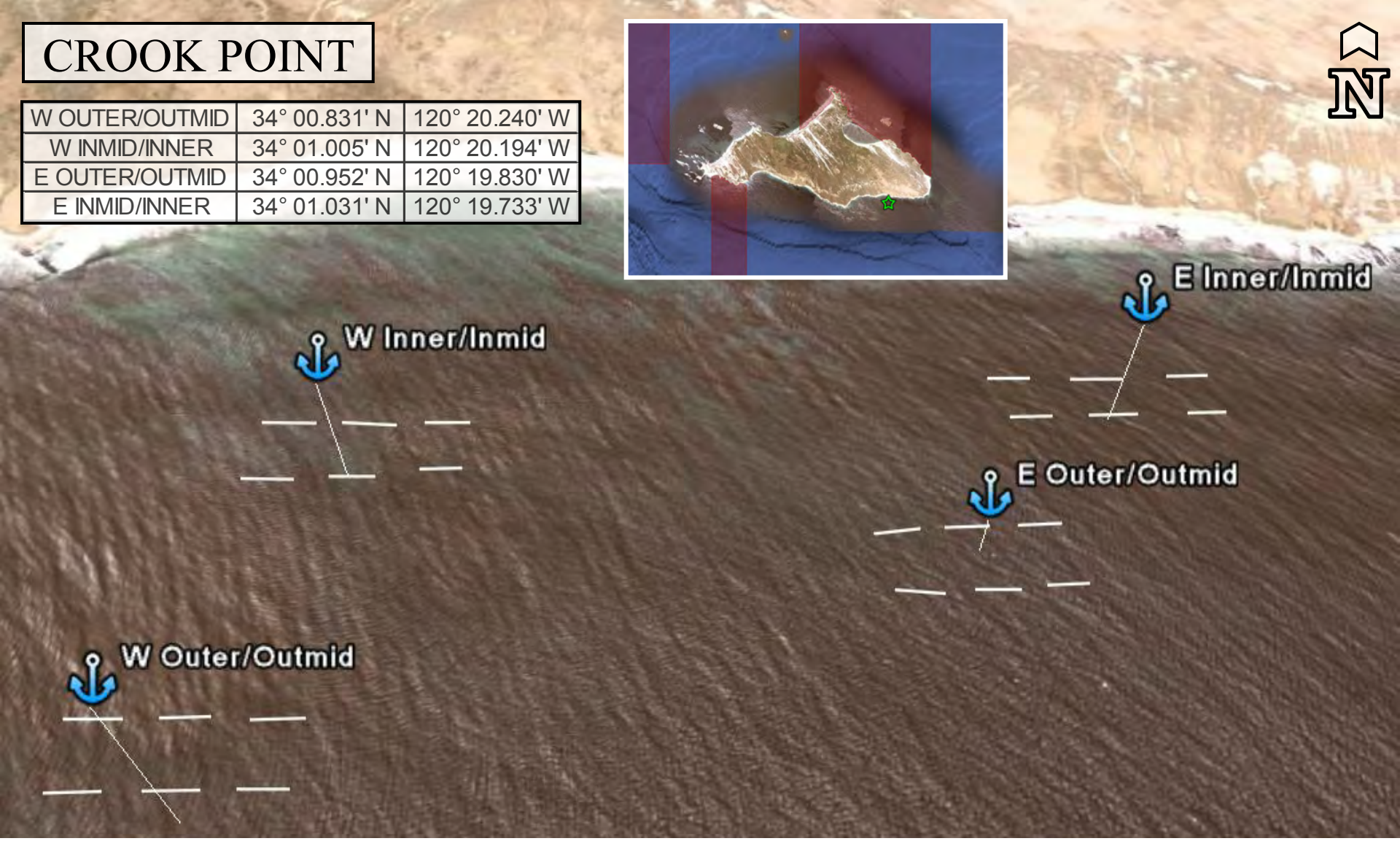
NOTES:

W: Between island and Hare rock. Outers are at base of reef, along edge of kelp. Mid and inners are up on rocky plateau, inners are usually deep in kelp bed.

E: Outer is at base of high relief reef, kelp is sometimes thick. Swim from Outer anchor point to Inmid/Inner. Inmid/Inner in high relief reef. Inners often on top of ridge, with Inmids down a little deeper.

CROOK POINT

W OUTER/OUTMID	34° 00.831' N	120° 20.240' W
W INMID/INNER	34° 01.005' N	120° 20.194' W
E OUTER/OUTMID	34° 00.952' N	120° 19.830' W
E INMID/INNER	34° 01.031' N	120° 19.733' W



W OUTER	50-55 FT	90
W OUTMID	40-50 FT	90
W INMID	30-35 FT	90
W INNER	20-25 FT	90

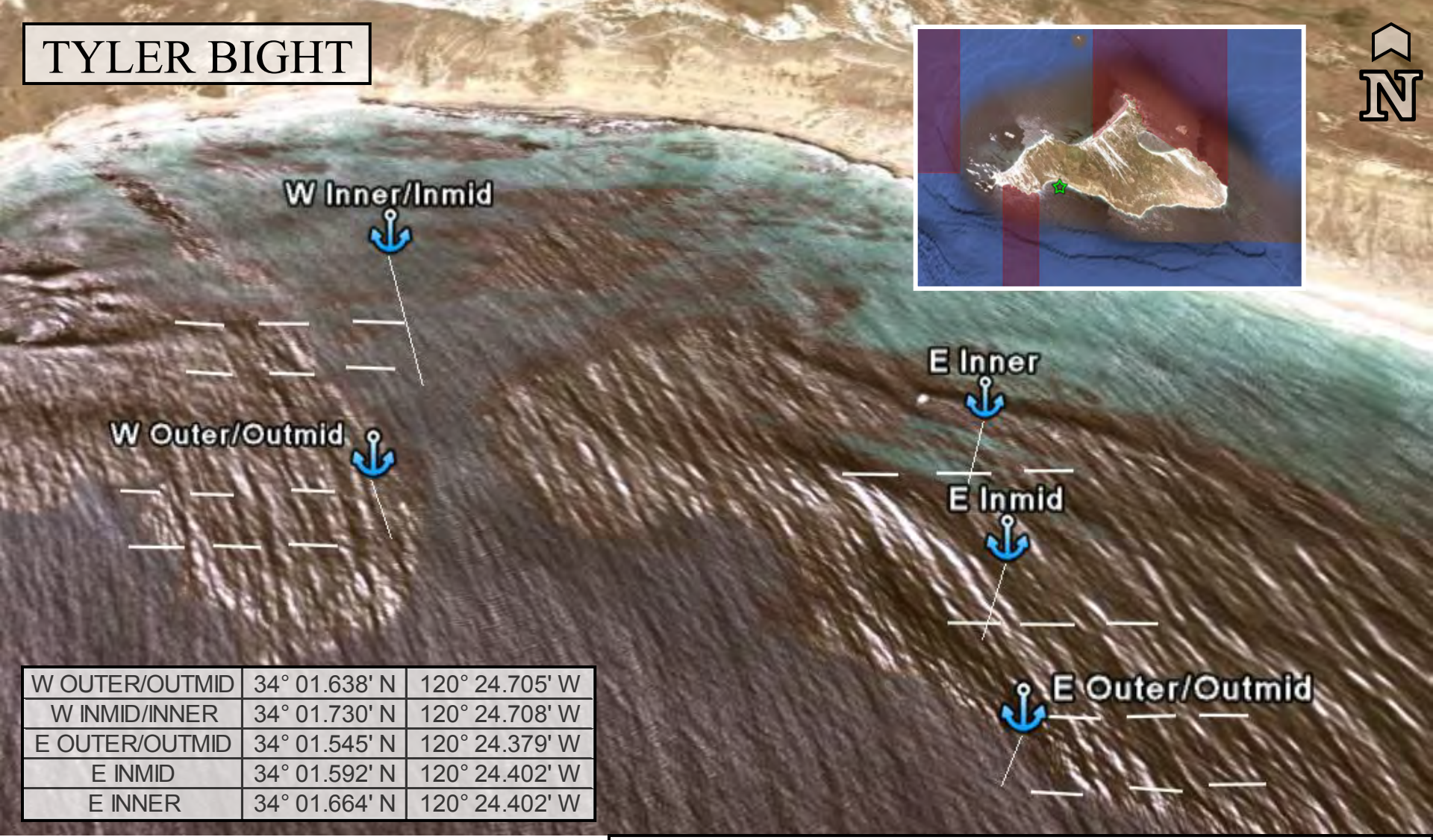
E OUTER	50-60 FT	90
E OUTMID	40-50 FT	90
E INMID	30-35 FT	90
E INNER	20-25 FT	90

NOTES:

W: Outer has high relief ledges and big overhangs, find those! W Inner/Inmid are patchy low relief reef. Easily stirred up.

E: Outer is flat, low relief Laminaria graveyard. Inner/Inmid are also low relief, with some low ledges/cracks.

TYLER BIGHT



W OUTER/OUTMID	34° 01.638' N	120° 24.705' W
W INMID/INNER	34° 01.730' N	120° 24.708' W
E OUTER/OUTMID	34° 01.545' N	120° 24.379' W
E INMID	34° 01.592' N	120° 24.402' W
E INNER	34° 01.664' N	120° 24.402' W

W OUTER	45-55 FT	90
W OUTMID	30-35 FT	90
W INMID	30-40 FT	90
W INNER	20-25 FT	90

E OUTER	45-50 FT	90
E OUTMID	35-40 FT	90
E INMID	25-30 FT	90
E INNER	15-20 FT	90

NOTES:

W: Outer crazy high relief, stay west of sand channel on eastern edge of kelp bed. Inner/Inmid have plenty of reef, more low relief with some boulder, swim to west from anchor into kelp bed.

E: Outer could be big boulders with sand or fairly continuous reef. Double check. Kelp is always very thick, swim inshore to appropriate depth. Inner/Inmid tend to have high relief, some big ledges.

Run one TX to the west and two to the east for all zones of side E.