Exhibit 2: 2003 National Marine Sanctuary Seafloor Habitat Desktop Study

Final report for the 'desktop habitat study' of GFNMS and CBNMS.

The study is an inventory of all the known habitat and bathymetric data in the two sanctuaries.

The work was performed by Lee Murai who is a Moss Landing Graduate Student under the supervision of Gary Greene.

The project was delivered on Dec. 23, 2003.

User notes for Cordell Bank and Gulf of the Farallones Desktop Study

USGS Seabed data

The USGS seabed data include the sample name, location (decimal degrees), and the original data source. If available the following may also be included:

- sample top/bottom
- sampler type
- gravel/sand/mud(clay) percent
- mean/median grain size
- sorting
- rock membership
- weed membership
- carbonate percent
- real color (Munsell)
- organic carbon
- shear strength (or estimate)
- porosity (or estimate)
- p-wave velocity (or estimate)
- roughness (or estimate)
- critical shear stress (or estimate)
- component/facies (i.e., shells, terrigenous, bioturbated, plants, coral, volcanic, etc. etc.)

USGS Activities

The USGS surveys listed represent any USGS activity that contains data falling within the desktop study area. Information regarding the surveys was obtained from the USGS Coastal and Marine Geology InfoBank website: http://walrus.wr.usgs.gov/infobank/. In addition to the information provided in the included table, the website provides a location map of the survey and links to metadata and data when available. Data quality and resolution of USGS data were not included due to the variety of data represented and lack of available information.

Side-scan sonar data were collected in the vicinity of Fanny Shoal Bank in July 2003. However, this data has not been processed and so it was not included within the desktop study.

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Chase, T.E., Young, J.D., Degnan, C.H., Maple, E.J., 1991. Marine Topography of the Gulf of the Farallones between 37° 46’ 00” to 37° 50’ 00” north and 122° 28’ 30” to 122° 39’ 00” west including the Potato Patch and the Golden Gate, U.S. Geological Survey map.

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Murai, L.Y., Greene, H.G., 2003. Critical analysis of NOAA *Davidson* multibeam data, Center for Habitat Studies, Moss Landing Marine Laboratories, Prepared for Cordell Bank National Marine Sanctuary.

National Geophysical Data Center (NGDC) Marine Geophysics On-line System.
http://www.ngdc.noaa.gov/mgg/gdas/

USGS Coastal and Marine Geology InfoBank.
http://walrus.wr.usgs.gov/infobank/

Wong, F.L., Eittreim, S.L., 2003. Continental Shelf GIS for the Monterey Bay National Marine Sanctuary, U.S. Geological Survey Open-file Report 01-179.
http://geopubs.wr.usgs.gov/open-file/of01-179/.

Exhibit 2: 2003 National Marine Sanctuary Seafloor Habitat Desktop Study

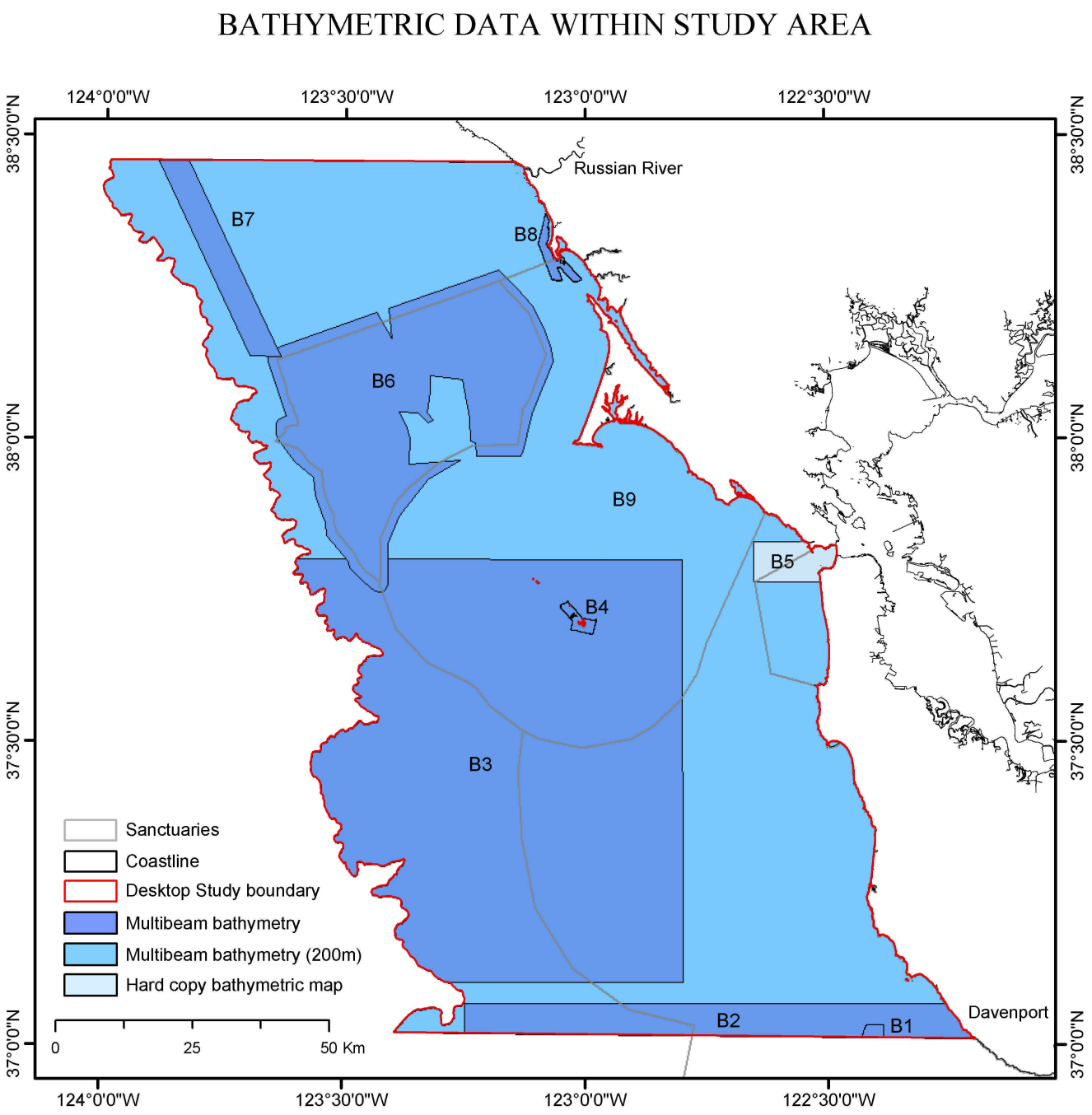


Exhibit 2: 2003 National Marine Sanctuary Seafloor Habitat Desktop Study

HABITAT MAPS WITHIN STUDY AREA

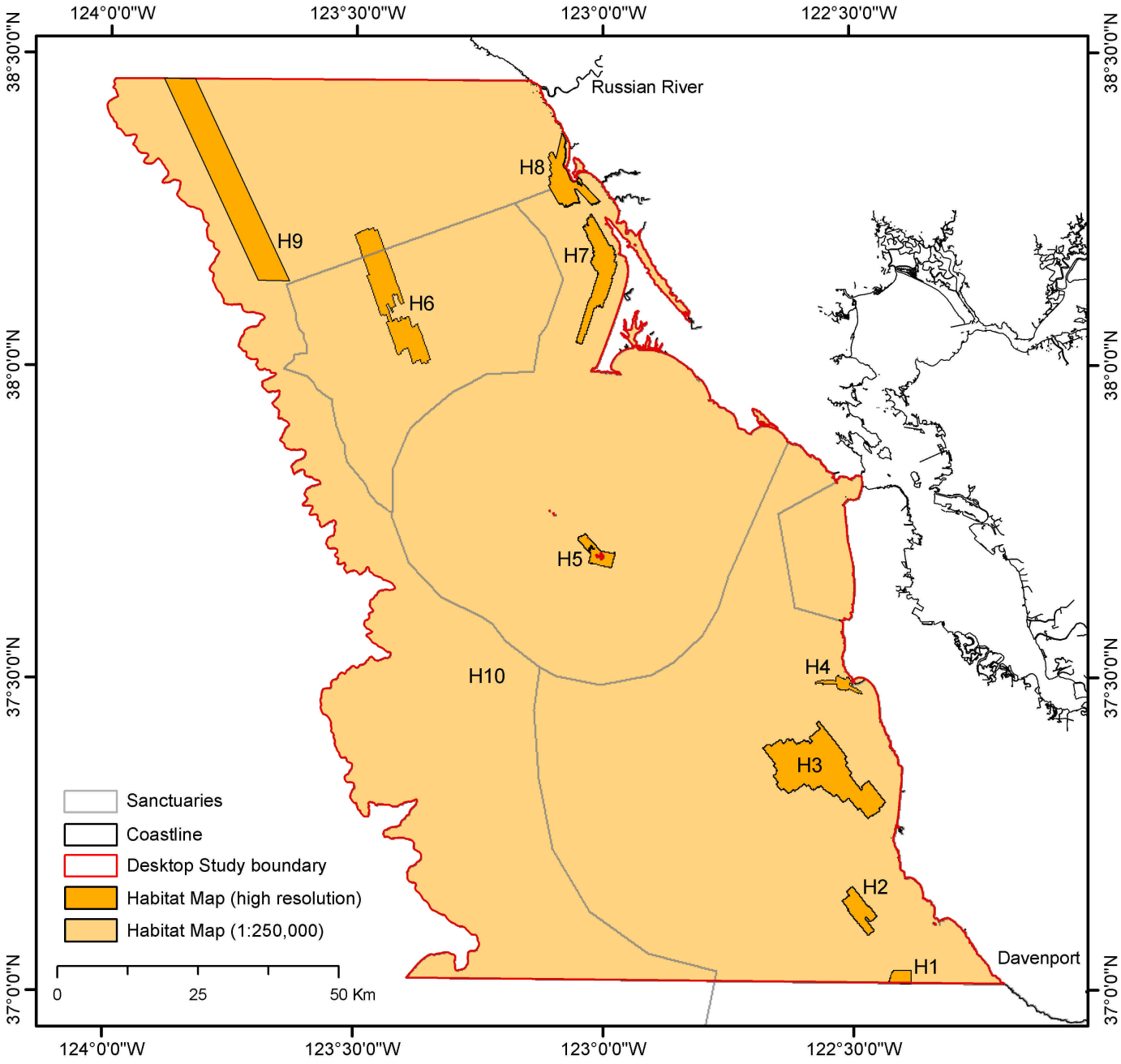


Exhibit 2: 2003 National Marine Sanctuary Seafloor Habitat Desktop Study

GEOLOGIC DATA WITHIN STUDY AREA

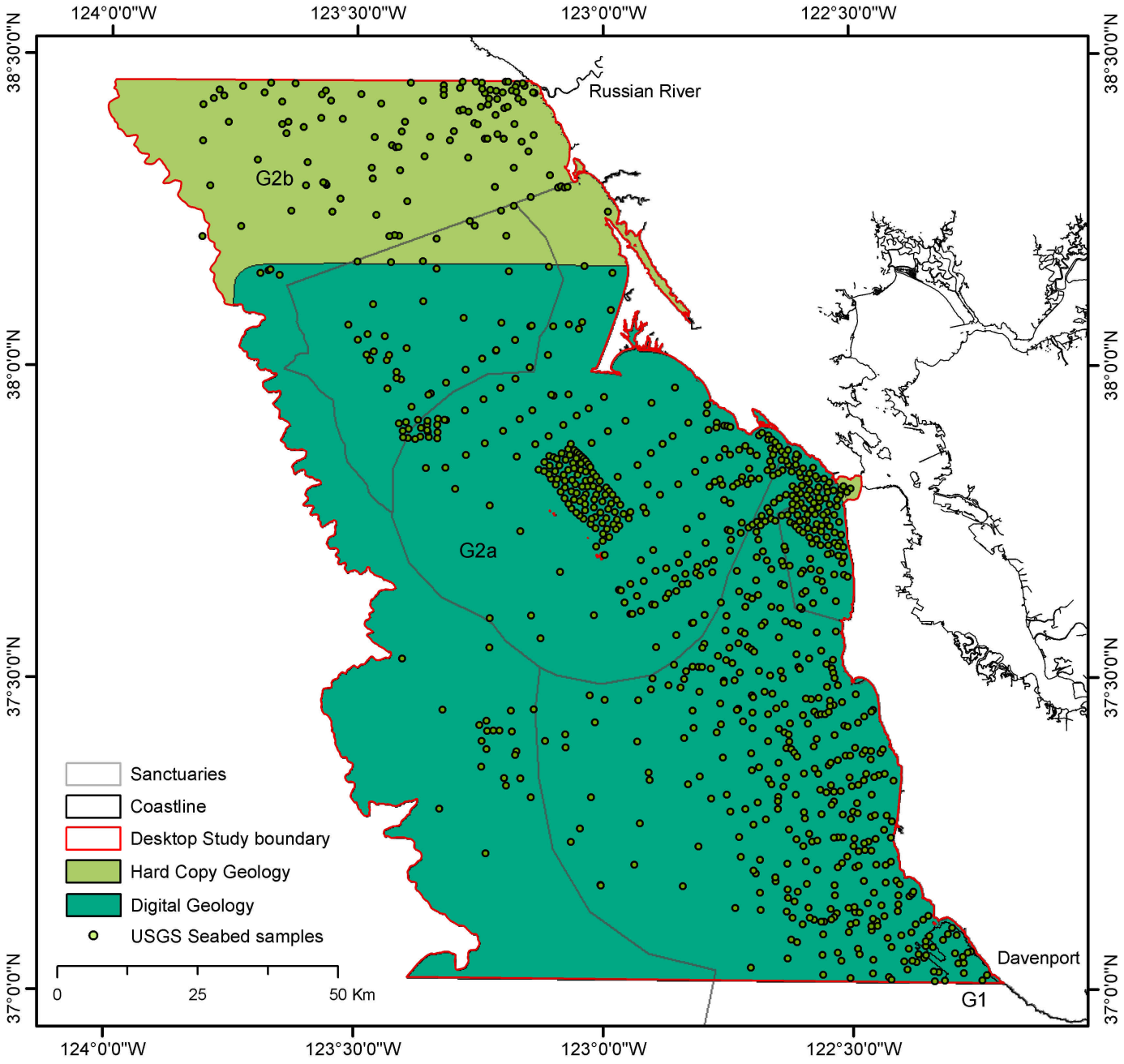
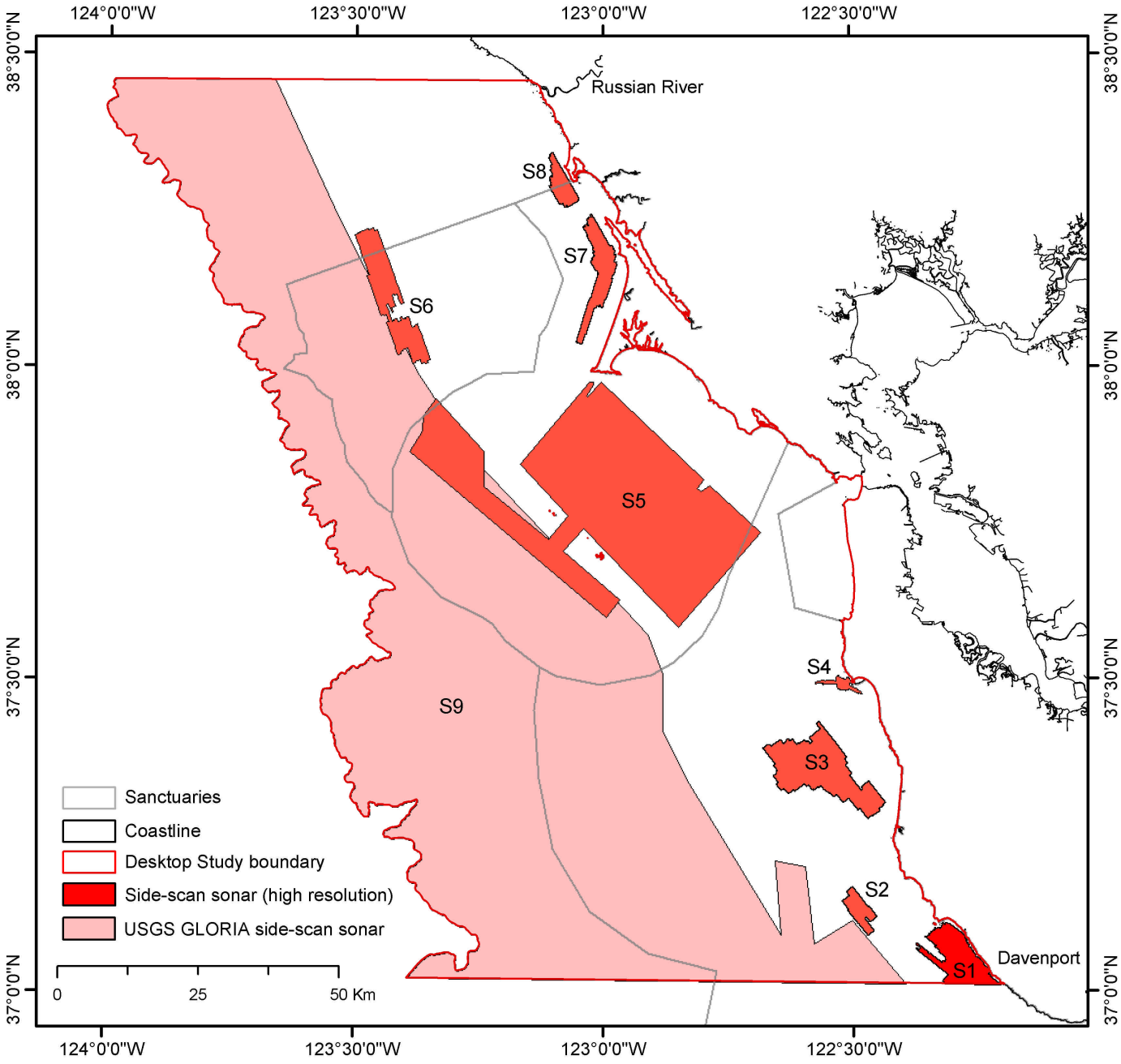


Exhibit 2: 2003 National Marine Sanctuary Seafloor Habitat Desktop Study

SIDE-SCAN SONAR DATA WITHIN STUDY AREA



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ID	NAME OF PROJECT	COORDINATES	OWNER OF DATA	COLLECTOR OF DATA	INTENDED USE	RESTRICTIONS ON USE	TYPE OF DATA	EQUIPMENT USED	SPATIAL RESOLUTION	COMPLETED OR ONGOING	HABITAT MAP?	CLASSIFICATION TYPE	FORMAT OF DATA	DATA QUALITY	REFERENCES
SIDE-SCAN SONAR															
S1	Continental Shelf GIS for the Monterey Bay National Marine Sanctuary	N: 4107577, S: 4096481 W: 555326, E: 570511	USGS	Steve Eittreim, Florence Wong	scientific research	none	side-scan sonar	side-scan sonar system	40cm-2.5m	completed	no	N/A	.tiff	excellent	Continental Shelf GIS for the Monterey Bay National Marine Sanctuary; Website: http://geopubs.wr.usgs.gov/open-file/of01-179/
S2	Outer Santa Cruz Basin 1	N: 4113806, S: 4105753 W: 542396, E: 548435	Delta Oceanographics, Inc. and Racal Pelagos, Inc.	General Oceanographics	oil exploration	semi-proprietary	side-scan sonar, habitat map	industry side-scan sonar system	1:5,000	completed	yes	greene et al., 1999	.tiff	excellent	Report: Essential Fish Habitat Characterization and Mapping of the California Continental Margin, 2003
S3	Outer Santa Cruz Basin 2	N: 4143151, S: 4125932 W: 528256, E: 549985	Delta Oceanographics, Inc. and Racal Pelagos, Inc.	General Oceanographics	oil exploration	semi-proprietary	side-scan sonar, habitat map	industry side-scan sonar system	1:10,000	completed	yes	greene et al., 1999	.tiff	excellent	Report: Essential Fish Habitat Characterization and Mapping of the California Continental Margin, 2003
S4	Half Moon Bay ATOC cable survey	N: 4151393, S: 4148057 W: 537594, E: 545794	MBARI, MBNMS, and MLML's Center For Habitat Studies	MBARI, MBNMS, and MLML's Center For Habitat Studies	scientific research	none	side-scan sonar, habitat map	Klein 595 side-scan sonar system	1:5,000	completed	yes	greene et al., 1999	.tiff	excellent	Environmental Impact of the ATOC/Pioneer Seamount Submarine Cable, 2003
S5	USGS F-9-89-NC	N: 38.0028, S: 37.5070, W: -123.3872, E: -122.1934	USGS, Western Region	John Chin, Herman Karl, Bill Schwab	scientific research	none	3.5 kHz bathy, 10 kHz bathy, side-scan sonar, shipboard gravity	3.5 kHz bathy, 10 kHz bathy, side-scan sonar, shipboard gravity	various	completed	no	N/A	---	excellent	Cruise Report: F989NC, metadata for bathymetry, gravity
S6	Bodega Basin 1	N: 4230866, S: 4206670 W: 455912, E: 469250	Delta Oceanographics, Inc. and Racal Pelagos, Inc.	General Oceanographics	oil exploration	semi-proprietary	side-scan sonar, habitat map	industry side-scan sonar	1:6,000	completed	yes	greene et al., 1999	.tiff	excellent	Report: Essential Fish Habitat Characterization and Mapping of the California Continental Margin, 2003
S7	Bodega Basin 2	N: 4233287, S: 4210150 W: 495102, E: 502338	Delta Oceanographics, Inc. and Racal Pelagos, Inc.	General Oceanographics	oil exploration	semi-proprietary	side-scan sonar, habitat map	industry side-scan sonar system	1:6,000	completed	yes	greene et al., 1999	.tiff	excellent	Report: Essential Fish Habitat Characterization and Mapping of the California Continental Margin, 2003
S8	Bodega Basin 3	N: 4247496, S: 4234443 W: 490209, E: 499350	Delta Oceanographics, Inc., Racal Pelagos, Inc.	General Oceanographics	oil exploration	semi-proprietary	side-scan sonar and multibeam bathymetry, habitat map	industry side-scan sonar and Reson 8101 multibeam system	1:6,000	completed	yes	greene et al., 1999	.tiff	excellent	Report: Essential Fish Habitat Characterization and Mapping of the California Continental Margin, 2003
S9	GLORIA side-scan	N: 4257285, S: 4096655 W: 412059, E: 553732	USGS	USGS	scientific research	none	side-scan sonar	Geologic Long-Range Inclined Asdic	1:2-1:10 million	completed	no	N/A	.tiff	fair	Geology of the United States Seafloor: The View from GLORIA, 1996
BATHYMETRY															
B1	Ascension Canyon	N: 4099034, S: 4091126 W: 548660, E: 554612	MBARI	MBARI	scientific research	none	multibeam bathymetry, habitat map	Konsberg Simrad EM 300 multibeam systems	1:30,000	completed	yes	greene et al., 1999	.tiff	excellent	CD-ROM: MBARI Monterey Bay Multibeam Survey ; Report: Essential Fish Habitat Characterization and Mapping of the California Continental Margin, 2003
B2	Monterey Bay Region Multibeam Survey	N: 4103485, S: 3925965 W: 463580, E: 634580	MBARI	MBARI	scientific research	none	multibeam bathymetry	Konsberg Simrad EM 1000 and EM 300 multibeam systems	1:100,000	completed	yes	greene et al., 1999	.tiff	excellent	CD-ROM: MBARI Monterey Bay Multibeam Survey ; Report: Essential Fish Habitat Characterization and Mapping of the California Continental Margin, 2003
B3	Gulf of the Farallones processed NOAA Seabeam	N: 4203496, S: 4159862 W: 465619, E: 527782	USGS	Pat Chavez, Herman Karl	scientific research	none	bathymetry	Seabeam bathymetric system	200m?	completed	yes	EFH code modified after greene et al., 1999	.tiff	excellent	Report: Essential Fish Habitat Characterization and Mapping of the California Continental Margin, 2003
B4	Farallon Islands	N: 4176454, S: 4170414 W: 495432, E: 502049	CSUMB Seafloor Mapping Lab	CSUMB Seafloor Mapping Lab	scientific research	none	multibeam bathymetry, habitat map	Reson 8101 mubltibeam system	1:5,500	completed	yes	greene et al., 1999	.tiff	excellent	Report: Essential Fish Habitat Characterization and Mapping of the California Continental Margin, 2003
B5	Marine Topography of the Gulf of the Farallones	N: 4187364, S: 4180018 W: 530794, E: 546014	USGS	T.E. Chase, J.D. Young, C.H. Degnan, and E.J. Maple	scientific research	none	hard copy bathymetric map	various	~1:20,000	completed	no	N/A	hard copy	good	Map: Marine Topography of the Gulf of the Farallones including the Potato Patch and Golden Gate, 1991
B6	davidson multibeam	N: 4237083, S: 4178230 W: 442012, E: 494028	National Geophysical Data Center	NOAA	scientific research	none	bathymetry	Hydrosweep BS3	50 meter resolution	completed	no	N/A	point shapefile (.shp)	fair	Report: Critical Analysis of NOAA *Davidson* multibeam data, 2003
B7	Point Reyes to Eel River Basin	N: 4513952, S: 4221297 W: 444360, E: 336661	MBARI	MBARI	scientific research	none	multibeam bathymetry, backscatter, vector line shapefile-contours, habitat map	Konsberg Simrad EM 300 multibeam systems	1:150,000	completed	yes	greene et al., 1999	.tiff, vector line shapefile (.shp)	very good	Report: Essential Fish Habitat Characterization and Mapping of the California Continental Margin, 2003
B8	Bodega Basin 4	N: 4247496, S: 4234443 W: 490209, E: 499350	CSUMB Seafloor Mapping Lab	CSUMB Seafloor Mapping Lab	scientific research	none	side-scan sonar and multibeam bathymetry, habitat map	industry side-scan sonar and Reson 8101 multibeam system	1:6,000	completed	yes	greene et al., 1999	.tiff	excellent	Report: Essential Fish Habitat Characterization and Mapping of the California Continental Margin, 2003
B9	NOAA/NGDC bathymetry	N: 4257285, S: 4096473 W: 412059, E: 571293	National Geophysical Data Center	NOAA	scientific research	none	bathymetry	various	various	ongoing	no	N/A	various	fair	http://www.ngdc.noaa.gov/mgg/bathymetry/relief.html
B10	CDF&G bathymetry	N: 4257285, S: 4096473 W: 412059, E: 571293	California Department of Fish and Game	various	scientific research	none	vector line shapefile contours	various	10 meter contour interval	completed	no	N/A	vector line shapefile (.shp)	good	Website: California Department of Fish and Game Spatial Resources, http://maphost.dfg.ca.gov/bathymetry.htm

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GEOLOGY															
G1	Seafloor Rocks and Sediments of the Continental Shelf from Monterey Bay to Point Sur	N: 4107577, S: 4096481 W: 555326, E: 570511	USGS	Steve Eittreim, Roberto Anima, Andrew Stevenson, and Florence Wong	scientific research	none	geologic map	various	1:100,000	completed	no	N/A	polygon shapefile (.shp)	excellent	Seafloor Rocks and Sediments of the Continental Shelf from Monterey Bay to Point Sur, California; Website: http://geopubs.wr.usgs.gov/map-mf/mf2345/
G2a,b	California Continental Margin Geologic Map Series	N: 4224568, S: 3762689 W: 433206, E: 737191	California Division of Mines and Geology and USGS	California Division of Mines and Geology and USGS	scientific research	none	geological map, habitat map	various	1:250,000	completed	yes	greene et al., 1999	polygon shapefile (.shp) , hard copy	excellent	Maps: California Continental Margin Geologic Map Series Geology Maps 5 (G2a) and 6 (G2b); Report: Essential Fish Habitat Characterization and Mapping of the California Continental Margin
G3	USGS seabed data	N: 4256727, S: 4096781 W: 428785, E: 568318	USGS	various	scientific research	none	seafloor sediment samples	various	point data	ongoing	no	N/A	.shp	excellent	USGS contact: jareid@usgs.gov
HABITAT MAPS															
H1	Ascension Canyon	N: 4099034, S: 4091126 W: 548660, E: 554612	MLML Center For Habitat Studies and CSUMB Seafloor Mapping Lab	MLML Center For Habitat Studies	fisheries science	limited	habitat map	N/A	1:30,000	completed	yes	greene et al., 1999	polygon shapefile (.shp)	excellent	Reports: Fisheries Habitat Characterization of the California Continental Margin; Essential Fish Habitat Characterization and Mapping of the California Continental Margin
H2	Outer Santa Cruz Basin 1	N: 4113806, S: 4105753 W: 542396, E: 548435	MLML Center For Habitat Studies and CSUMB Seafloor Mapping Lab	MLML Center For Habitat Studies	fisheries science	none	habitat map	N/A	1:5,000	completed	yes	greene et al., 1999	polygon shapefile (.shp)	excellent	Reports: Fisheries Habitat Characterization of the California Continental Margin, 2002; Essential Fish Habitat Characterization and Mapping of the California Continental Margin, 2003
H3	Outer Santa Cruz Basin 2	N: 4143151, S: 4125932 W: 528256, E: 549985	MLML Center For Habitat Studies and CSUMB Seafloor Mapping Lab	MLML Center For Habitat Studies	fisheries science	none	habitat map	N/A	1:10,000	completed	yes	greene et al., 1999	polygon shapefile (.shp)	excellent	Reports: Fisheries Habitat Characterization of the California Continental Margin, 2002; Essential Fish Habitat Characterization and Mapping of the California Continental Margin, 2003
H4	Half Moon Bay ATOC cable survey	N: 4151393, S: 4148057 W: 537594, E: 545794	MBARI, MBNMS, and MLML's Center For Habitat Studies	MBARI, MBNMS, and MLML's Center For Habitat Studies	fisheries science	limited	habitat map	N/A	1:5,000	completed	yes	greene et al., 1999	polygon shapefile (.shp)	excellent	Reports: Fisheries Habitat Characterization of the California Continental Margin, 2002; Essential Fish Habitat Characterization and Mapping of the California Continental Margin, 2003
H5	Farallon Islands	N: 4176454, S: 4170414 W: 495432, E: 502049	MLML Center For Habitat Studies and CSUMB Seafloor Mapping Lab	MLML Center For Habitat Studies	fisheries science	none	habitat map	N/A	1:5,500	completed	yes	greene et al., 1999	polygon shapefile (.shp)	excellent	Reports: Fisheries Habitat Characterization of the California Continental Margin, 2002; Essential Fish Habitat Characterization and Mapping of the California Continental Margin, 2003
H6	Bodega Basin 1	N: 4230866, S: 4206670 W: 455912, E: 469250	MLML Center For Habitat Studies and CSUMB Seafloor Mapping Lab	MLML Center For Habitat Studies	fisheries science	none	habitat map	N/A	1:6,000	completed	yes	greene et al., 1999	polygon shapefile (.shp)	excellent	Reports: Fisheries Habitat Characterization of the California Continental Margin, 2002; Essential Fish Habitat Characterization and Mapping of the California Continental Margin, 2003
H7	Bodega Basin 2	N: 4233287, S: 4210150 W: 495102, E: 502338	MLML Center For Habitat Studies and CSUMB Seafloor Mapping Lab	MLML Center For Habitat Studies	fisheries science	none	habitat map	N/A	1:6,000	completed	yes	greene et al., 1999	polygon shapefile (.shp)	excellent	Reports: Fisheries Habitat Characterization of the California Continental Margin, 2002; Essential Fish Habitat Characterization and Mapping of the California Continental Margin, 2003
H8	Bodega Basin 3/4	N: 4247496, S: 4234443 W: 490209, E: 499350	MLML Center For Habitat Studies and CSUMB Seafloor Mapping Lab	MLML Center For Habitat Studies	fisheries science	none	habitat map	N/A	1:6,000	completed	yes	greene et al., 1999	polygon shapefile (.shp)	excellent	Reports: Fisheries Habitat Characterization of the California Continental Margin, 2002; Essential Fish Habitat Characterization and Mapping of the California Continental Margin, 2003
H9	Point Reyes to Eel River Basin	N: 4513952, S: 4221297 W: 444360, E: 336661	MLML Center For Habitat Studies	MLML Center For Habitat Studies	fisheries science	none	habitat map	N/A	1:150,000	completed	yes	greene et al., 1999	polygon shapefile (.shp)	very good	Report: Essential Fish Habitat Characterization and Mapping of the California Continental Margin, 2003
H10	Essential Fish Habitat Characterization and Mapping of the California Continental Margin	N: 4257285, S: 4096473 W: 412059, E: 571293	MLML Center For Habitat Studies and Pacific States Marine Fisheries Commission (NOAA/NMFS)	MLML Center For Habitat Studies	fisheries science	proprietary	habitat map	N/A	various	completed	yes	EFH code modified after greene et al., 1999	polygon shapefile (.shp)	good	Report: Essential Fish Habitat Characterization and Mapping of the California Continental Margin, 2003

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NAME OF PROJECT	COORDINATES	OWNER OF DATA	COLLECTOR OF DATA	INTENDED USE	RESTRICTIONS ON USE	TYPE OF DATA	EQUIPMENT USED	SPATIAL RESOLUTION	COMPLETED OR ONGOING	HABITAT MAP?	CLASSIFICATION TYPE	FORMAT OF DATA	DATA QUALITY	REFERENCES
USGS SURVEYS WITHIN STUDY AREA														
E-2-94-NC	N: 37.8242, S: 37.0536 W: -123.3101, E: -122.1928	USGS, Western Region	Herman Karl, John Chin	geophysical, geological	none	3.5 kHz bathymetry, side-scan sonar, van veen grab	3.5 kHz bathymetry, side-scan sonar, van veen grab	various	completed	no	N/A	analog	---	USGS Cruise Report: E294NC
F-12-88-NC	N: 38.9363, S: 37.5054, W: -123.8838, E: -122.1953	USGS, Western Region	Mike Field, Jim Gardner	geophysical, geological	none	3.5 kHz bathymetry, side-scan sonar, vibrating core (Alpine), gravity core	3.5 kHz bathymetry, side-scan sonar, vibrating core (Alpine), gravity core	various	completed	no	N/A	analog, digital for cores	---	metadata for cores
F-13-88-NC	N: 38.6846, S: 34.8572, W: -123.5290, E: -120.7139	USGS, Western Region	Dave Cacchione, Dave Drake	geophysical, geological	none	side-scan sonar, box core, gravity core	side-scan sonar, box core, gravity core	various	completed	no	N/A	analog	---	metadata for box cores and gravity cores
F-1-89-NC	N: 38.0601, S: 37.4078, W: -123.4158, E: -122.1958	USGS, Western Region	Dave Rubin, John Chin	geophysical	none	Huntec side-scan sonar, uniboom	Huntec side-scan sonar, uniboom	various	completed	no	N/A	analog, digital for gravity	---	metadata for bathymetry, gravity, seismic
F-2-84-NC	N: 38.9693, S: 33.6742, W: -127.6812, E: -118.2100	USGS, Western Region	Jim Gardner, Dave McCulloch	geophysical	none	3.5 kHz bathy, side-scan sonar, magnetometer, two-channel airgun	3.5 kHz bathy, side-scan sonar, magnetometer, two-channel airgun	various	completed	no	N/A	analog, digital for bathymetry, magnetics	---	metadata for bathymetry magnetics, seismic
F-2-89-NC	N: 38.0799, S: 37.4161, W: -123.4014, E: -122.3841	USGS, Western Region	Bill Schwab, John Chin, Herman Karl	geophysical, geological	none	uniboom, Huntec deep tow side-scan, two-channel airgun, gravity, 3.5 kHz bathy, 10 kHz bathy, soutar grab	uniboom, Huntec deep tow side-scan, two-channel airgun, gravity, 3.5 kHz bathy, 10 kHz bathy, soutar grab	various	completed	no	N/A	analog, digital for gravity	---	metadata for bathymetry, soutar grab, seismic
F-4-89-NC	N: 38.6810, S: 34.8478, W: -123.6421, E: -120.7142	USGS, Western Region	Dave Cacchione, Dave Drake	geophysical, geological	none	3.5 kHz bathy, geoprobe, side-scan sonar, box core, van veen grab	3.5 kHz bathy, geoprobe, side-scan sonar, box core, van veen grab	various	completed	no	N/A	analog	---	metadata for bathymetry, samples
F-6-87-NC	N: 39.0618, S: 34.2166, W: -124.1998, E: -121.1166\	USGS, Western Region	Dave McCulloch, Steve Lewis	geophysical	none	3.5 kHz bathy, dart core, chain dredge, two-channel airgun	3.5 kHz bathy, dart core, chain dredge, two-channel airgun	various	completed	no	N/A	analog	---	Publications: (GeoRef # 1994-005790, GeoRef # 1995-032722); metadata for bathymetry, seismic
F-7-90-NC	N: 37.8344, S: 37.1091, W: -123.6317, E: -122.1932	USGS, Western Region	Herman Karl, Dave Drake, Bill Schwab	geophysical	none	3.5 kHz bathy, 4.5 kHz bathy, 10 kHz bathy, side-scan sonar, acoustic bottom transponder	3.5 kHz bathy, 4.5 kHz bathy, 10 kHz bathy, side-scan sonar, acoustic bottom transponder	various	completed	no	N/A	analog, digital for bathymetry	---	USGS Cruise Report: F790NC; metadata for bathymetry
F-8-89-NC	N: 37.9500, S: 37.5055, W: -123.5659, E: -122.1930	USGS, Western Region	Herman Karl, Bill Schwab, John Chin	geophysical	none	10 kHz bathy, 3.5 kHz bathy, side-scan sonar, shipboard gravity, landtie, shipboard magnetics	10 kHz bathy, 3.5 kHz bathy, side-scan sonar, shipboard gravity, landtie, shipboard magnetics	various	completed	no	N/A	analog, digital for gravity	---	USGS Cruise Report: F889NC; metadata for bathymetry, gravity, samples
F-8-90-NC	N: 38.0707, S: 37.1621, W: -123.5318, E: -122.2007	USGS, Western Region	Herman Karl, Dave Drake	geophysical and geological	none	3.5 kHz bathy, 10 kHz bathy, 12 kHz bathy, seafloor camera, acoustic bottom transponder, box core, gravity core, chain dredge	3.5 kHz bathy, 10 kHz bathy, 12 kHz bathy, seafloor camera, acoustic bottom transponder, box core, gravity core, chain dredge	various	completed	no	N/A	analog, digital for bathymetry	---	Publications: (GeoRef # 1995-022860, GeoRef # 1995-065966, GeoRef # 1996-078685); Cruise Report: F890NC; metadata for bathymetry, camera, samples

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NAME OF PROJECT	COORDINATES	OWNER OF DATA	COLLECTOR OF DATA	INTENDED USE	RESTRICTIONS ON USE	TYPE OF DATA	EQUIPMENT USED	SPATIAL RESOLUTION	COMPLETED OR ONGOING	HABITAT MAP?	CLASSIFICATION TYPE	FORMAT OF DATA	DATA QUALITY	REFERENCES
USGS SURVEYS WITHIN STUDY AREA cont.														
G-2-95-SF	N: 38.1544, S: 37.4970, W: -122.7621, E: -121.6870	USGS, Western Region	Terry Bruns, Paul Carlson, Dennis Mann	geophysical	none	high resolution cdp, side-scan sonar	high resolution cdp, side-scan sonar	various	completed	no	N/A	digital for bathymetry, seismic	---	USGS Open File Report 00-494
J-1-94-MB	N: 37.6224, S: 36.9173, W: -122.5622, E: -122.9952	USGS, Western Region	Roberto Anima, J.F. Trait	image nearshore, image sediment thickness, gather bathymetric profiles	none	Klein 100 kHz side-scan sonar, geopulse, fathometer	Klein 100 kHz side-scan sonar, geopulse, fathometer	various	completed	no	N/A	analog	---	---
J-2-95-MB	N: 37.1115, S: 36.9184, W: -122.3647, E: -121.8670	USGS, Western Region	Roberto Anima, Andy Stevenson, Steve Eittreim	geophysical	none	side-scan sonar, bathymetry profiler	side-scan sonar, bathymetry profiler	various	completed	no	N/A	analog, digital for bathymetry	---	---
J-3-82-TB	N: 38.2493, S: 38.1081, W: -122.9947, E: -122.8533	USGS, Western Region	Ed Clifton	geophysical and geological	none	12 kHz bathy, side-scan sonar, gravity core, Shipek grab, uniboom	12 kHz bathy, side-scan sonar, gravity core, Shipek grab, uniboom	various	completed	no	N/A	analog	---	metadata for bathymetry, samples, seismic
J-3-98-MB	N: 37.1139, S: 36.6080, W: -122.3297, E: -121.8203	USGS, Western Region	Roberto Anima	side-scan and bathymetry	none	side-scan sonar	side-scan sonar	various	completed	no	N/A	analog	---	---
J-4-98-MB	N: 37.1180, S: 36.6402, W: -122.3751, E: -121.8549	USGS, Western Region	Roberto Anima, Steve Eittreim	CTD retrieval, side-scan sonar, seismic, underwater video, sediment sampling	none	side-scan, geopulse, underwater television, van veen grab, digital fathometer	side-scan, geopulse, underwater television, van veen grab, digital fathometer	various	completed	no	N/A	analog, digital for bathymetry	---	Digital Data Series dds-61
J-5-82-TB	N: 38.3126, S: 38.1060, W: -123.0504, E: -122.8555	USGS, Western Region	Ed Clifton	geophysical and geological	none	side-scan sonar, uniboom, fathometer, gravity core, Shipek grab	side-scan sonar, uniboom, fathometer, gravity core, Shipek grab	various	completed	no	N/A	analog, digital for bathymetry	---	metadata for bathymetry, samples, seismic
J-6-95-MB	N: 37.0980, S: 36.8041, W: -122.3805, E: -121.8943	USGS, Western Region	Roberto Anima, Andy Stevenson, Steve Eittreim	geophysical	none	side-scan sonar, geopulse	side-scan sonar, geopulse	various	completed	no	N/A	analog, digital for bathymetry	---	---
L-13-81-NC	N: 41.7398, S: 37.5118, W: -124.6568, E: -122.1882	USGS, Western Region	Jim Gardner, Mike Field	geophysical and geological	none	3.5 kHz bathy, 12 kHz bathy, underwater camera, gravity, gravity core, uniboom, single-channel airgun	3.5 kHz bathy, 12 kHz bathy, underwater camera, gravity, gravity core, uniboom, single-channel airgun	various	completed	no	N/A	analog, digital for bathymetry, gravity cores	---	Publications (GeoRef # 1984-028138, GeoRef # 1987-074201); metadata for bathymetry, cameras, gravity, samples, seismic
L-1-79-NC	N: 38.6007, S: 37.5081, W: -123.3899, E: -122.1630	USGS, Western Region	Dave Cacchione, Dave Drake	geophysical and geological	none	3.5 kHz bathy, 12 kHz bathy, geoprobe, box core, doppler sonar	3.5 kHz bathy, 12 kHz bathy, geoprobe, box core, doppler sonar	various	completed	no	N/A	analog, digital for box cores	---	metadata for bathymetry, samples
L-1-81-NC	N: 38.6721, S: 37.7601, W: -123.7312, E: -122.3967	USGS, Western Region	Dave Cacchione, Dave Drake	geophysical and geological	none	3.5 kHz bathy, 12 kHz bathy, uniboom, side-scan sonar, geoprobe, underwater camera, gravity core	3.5 kHz bathy, 12 kHz bathy, uniboom, side-scan sonar, geoprobe, underwater camera, gravity core	various	completed	no	N/A	analog, digital for box cores	---	metadata for bathymetry, cameras, samples, seismic
L-1-85-NC	N: 37.8271, S: 37.4359, W: -123.1019, E: -122.1907	USGS, Western Region	Jim Gardner, Mike Field	geophysical	none	side-scan sonar, 3.5 kHz bathy, 12 kHz bathy	side-scan sonar, 3.5 kHz bathy, 12 kHz bathy	various	completed	no	N/A	analog	---	Publication (GeoRef # 1986-004575), metadata for bathymetry

Exhibit 2: 2003 National Marine Sanctuary Seafloor Habitat Desktop Study

NAME OF PROJECT	COORDINATES	OWNER OF DATA	COLLECTOR OF DATA	INTENDED USE	RESTRICTIONS ON USE	TYPE OF DATA	EQUIPMENT USED	SPATIAL RESOLUTION	COMPLETED OR ONGOING	HABITAT MAP?	CLASSIFICATION TYPE	FORMAT OF DATA	DATA QUALITY	REFERENCES
USGS SURVEYS WITHIN STUDY AREA cont.														
L-2-77-NC	N: 37.6806, S: 34.2793, W: -125.7133, E: -122.1634	USGS, Western Region	Bill Normark	geophysical and geological	none	3.5 kHz bathy, single-channel airgun, sonobuoy, gravity, boomerang core	3.5 kHz bathy, single-channel airgun, sonobuoy, gravity, boomerang core	various	completed	no	N/A	analog, digital for gravity, samples	---	Publications: (GeoRef# 1978-040880, 1978-042729, 1979-033350, 1980-013283, 1980-033660, 1981-004731, 1982-027407, 1985-009014, 1986-007946, 1988-079977, 1990-039052, 1993-015239)
L-2-79-NC	N: 37.8205, S: 32.6196, W: -123.1236, E: -117.1727	USGS, Western Region	Gary Greene	geophysical and geological	none	3.5 kHz bathy, 12 kHz bathy, uniboom, single-channel airgun, chain dredge, gravity, magnetics	3.5 kHz bathy, 12 kHz bathy, uniboom, single-channel airgun, chain dredge, gravity, magnetics	various	completed	no	N/A	analog, digital for gravity, magnetics,	---	metadata for bathymetry, gravity, samples, seismic
L-2-82-NC	N: 37.8386, S: 34.0151, W: -123.4899, E: -122.1948	USGS, Western Region	Don Tompkins, Dennis Mann	geophysical	none	3.5 kHz bathy, 12 kHz bathy, sonobuoy, 24-channel seismic, magnetics, gravity	3.5 kHz bathy, 12 kHz bathy, sonobuoy, 24-channel seismic, magnetics, gravity	various	completed	no	N/A	analog, digital for bathymetry, gravity, magnetics,	---	metadata for bathymetry, gravity, magnetics, seismic
L-2-83-NC	N: 37.8344, S: 36.4939, W: -122.7706, E: -121.8188	USGS, Western Region	Dave Scholl, Gary Greene	geophysical and geological	none	3.5 kHz bathy, 12 kHz bathy, doppler sonar, uniboom, single-channel airgun, sonobuoy, 24-channel seismic, chain dredge	3.5 kHz bathy, 12 kHz bathy, doppler sonar, uniboom, single-channel airgun, sonobuoy, 24-channel seismic, chain dredge	various	completed	no	N/A	analog, digital for seismic	---	Publications: (GeoRef # 1985-061988, GeoRef # 1992-007088); metadata for bathymetry, gravity, magnetics, samples, seismic
L-2-85-NC	N: 37.8345, S: 37.4710, W: -123.0470, E: -122.1911	USGS, Western Region	Bob Hall, Mike Torresan	geophysical	none	3.5 kHz bathy, 12 kHz bathy, side-scan sonar	3.5 kHz bathy, 12 kHz bathy, side-scan sonar	various	completed	no	N/A	analog, digital for bathymetry	---	Publication: (GeoRef # 1986-004575); metadata for bathymetry
L-3-82-NC	N: 37.8352, S: 36.5244, W: -123.0654, E: -122.2276	USGS, Western Region	Dave McCulloch	geophysical	none	3.5 kHz bathy, 12 kHz bathy, uniboom, single-channel airgun, magnetics, gravity	3.5 kHz bathy, 12 kHz bathy, uniboom, single-channel airgun, magnetics, gravity	various	completed	no	N/A	analog, digital for bathymetry, gravity, magnetics	---	metadata for bathymetry, gravity, magnetics, seismic
L-3-85-NC	N: 37.8666, S: 37.1673, W: -123.5588, E: -122.1916	USGS, Western Region	Bill Normark, Jan Morton	geophysical and geological	none	3.5 kHz bathy, 12 kHz bathy, chain dredge	3.5 kHz bathy, 12 kHz bathy, chain dredge	various	completed	no	N/A	analog, digital for bathymetry	---	metadata for bathymetry, cameras, samples
L-3-90-NC	N: 38.2962, S: 35.9867, W: -123.9381, E: -121.8755	USGS, Western Region	Dennis Mann, Steve Lewis	geophysical and geological	none	3.5 kHz bathy, 12 kHz bathy, 24-channel seismic, gravity, magnetics, single-channel airgun	3.5 kHz bathy, 12 kHz bathy, 24-channel seismic, gravity, magnetics, single-channel airgun	various	completed	no	N/A	analog, digital for gravity, seismic	---	metadata for bathymetry, gravity, seismic
L-4-77-NC	N: 42.7347, S: 37.7072, W: -125.9102, E: -122.9749	USGS, Western Region	Dave McCulloch	geophysical	none	12 kHz bathy, 24-channel seismic, single-channel airgun, gravity, magnetics	12 kHz bathy, 24-channel seismic, single-channel airgun, gravity, magnetics	various	completed	no	N/A	digital for bathymetry, gravity, magnetics, seismic	---	Publication: (GeoRef# 1987-025295); metadata for bathymetry, gravity, seismic
L-4-81-NC	N: 37.8335, S: 37.1028, W: -123.0337, E: -122.1861	USGS, Western Region	Dave McCulloch	geophysical	none	3.5 kHz bathy, 12 kHz bathy, uniboom seismic, gravity, magnetics, single-channel sparker	3.5 kHz bathy, 12 kHz bathy, uniboom seismic, gravity, magnetics, single-channel sparker	various	completed	no	N/A	analog, digital for bathymetry, gravity	---	metadata for bathymetry, gravity, seismic

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USGS SURVEYS WITHIN STUDY AREA cont.														
L-7-85-NC	N: 44.6513, S: 37.8644, W: -124.8140, E: -122.7374	USGS, Western Region	Dave Cacchione, Mike Field	geophysical and geological	none	3.5 kHz bathy, 12 kHz bathy, uniboom seismic, side-scan sonar, underwater camera, dart core, gravity core, van veen grab, single-channel airgun	3.5 kHz bathy, 12 kHz bathy, uniboom seismic, side-scan sonar, underwater camera, dart core, gravity core, van veen grab, single-channel airgun	various	completed	no	N/A	analog, digital for bathymetry	---	metadata for bathymetry, cameras, samples, seismic
M-1-95-MB	N: 37.8124, S: 36.2555, W: -123.1227, E: -121.8202	USGS, Western Region	Mark Pickett, Terry D. Jackson	geophysical and geological	none	side-scan sonar, uniboom, box core	side-scan sonar, uniboom, box core	various	completed	no	N/A	analog	---	USGS Open file report 01-107
M-1-96-MB	N: 37.2139, S: 36.8020, W: -122.7173, E: -121.8537	USGS, Western Region	Steve Eittreim, Andy Stevenson	geophysical	none	side-scan sonar, geopulse	side-scan sonar, geopulse	various	completed	no	N/A	analog	---	---
M-1-98-MB	N: 37.8494, S: 36.8540, W: -122.6842, E: -121.9054	USGS, Western Region	Brian Edwards, Steve Eittreim, Roberto Anima	geological	none	digital camera, dart core, van veen grab, underwater television	digital camera, dart core, van veen grab, underwater television	various	completed	no	N/A	analog	---	metadata for camera, samples
M-2-95-MB	N: 37.8255, S: 36.0016, W: -122.6783, E: -121.5629	USGS, Western Region	Mark Pickett, Terry D. Jackson	geophysical, geological, biological	none	side-scan sonar, uniboom, box core, bathymetry	side-scan sonar, uniboom, box core, bathymetry	various	completed	no	N/A	analog	---	---
M-2-98-NC	N: 37.8537, S: 37.4558, W: -123.3320, E: -122.1927	USGS, Western Region	Herman Karl, David Jones	Environmental sediment sampling	none	van veen grab	van veen grab	various	completed	no	N/A	analog	---	metadata for samples
M-4-97-MB	N: 37.8316, S: 36.6386, W: -122.9483, E: -121.8236	USGS, Western Region	Brian Edwards, Roberto Anima	high resolution geophysics	none	3.5 kHz bathy, Huntec seismic	3.5 kHz bathy, Huntec seismic	various	completed	no	N/A	analog	---	metadata for bathymetry, seismic
P-1-88-NC	N: 38.8089, S: 38.3870, W: -123.6506, E: -123.1315	USGS, Western Region	Dave Cacchione, Mike Field	geophysical	none	3.5 kHz bathy, 12 kHz bathy, side-scan sonar, uniboom seismic, seafloor camera, box core	3.5 kHz bathy, 12 kHz bathy, side-scan sonar, uniboom seismic, seafloor camera, box core	various	completed	no	N/A	analog, digital for box cores	---	metadata for bathymetry, cameras, samples
P-1-97-MB	N: 37.8436, S: 36.720, W: -122.9120, E: -121.7851	USGS, Western Region	Brian Edwards	box coring and 3.5 kHz	none	3.5 kHz bathy, box core	3.5 kHz bathy, box core	various	completed	no	N/A	analog	---	USGS Open file report 01-107; metadata for samples
P-2-95-MB	N: 37.8173, S: 36.5310, W: -122.9159, E: -121.7850	USGS, Western Region	Brian Edwards, Homa Lee	geological	none	3.5 kHz bathy, 12 kHz bathy, box core with camera, multicore, shipek grab, van veen grab, soutar grab	3.5 kHz bathy, 12 kHz bathy, box core with camera, multicore, shipek grab, van veen grab, soutar grab	various	completed	no	N/A	analog	---	Publication: (GeoRef# 1997-047876); USGS Open file report 01-107; metadata for bathy, samples
S-14-79-NC	N: 37.8477, S: 37.1844, W: -123.5430, E: -122.2015	USGS, Western Region	Steve Eittreim	geophysical and geological	none	3.5 kHz bathy, 12 kHz bathy, side-scan sonar, uniboom seismic	3.5 kHz bathy, 12 kHz bathy, side-scan sonar, uniboom seismic	various	completed	no	N/A	analog, digital for bathymetry	---	metadata for bathy, samples, seismic
S-4-78-NC	N: 37.8096, S: 36.6067, W: -123.5573, E: -121.7966	USGS, Western Region	Gary Greene	geophysical and geological	none	3.5 kHz bathy, 12 kHz bathy, side-scan sonar, uniboom seismic, single channel airgun, chain dredge	3.5 kHz bathy, 12 kHz bathy, side-scan sonar, uniboom seismic, single channel airgun, chain dredge	various	completed	no	N/A	analog, digital for bathymetry	---	metadata for bathy, cameras, magnetics, samples, seismic

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USGS SURVEYS WITHIN STUDY AREA cont.														

Exhibit 2: 2003 National Marine Sanctuary Seafloor Habitat Desktop Study

S-4-79-NC	N: 39.5260, S: 34.2581, W: -124.6121, E: -119.1586	USGS, Western Region	Dave McCulloch, Dave Rubin	geophysical	none	3.5 kHz bathy, 12 kHz bathy, magnetometer, sparker	3.5 kHz bathy, 12 kHz bathy, magnetometer, sparker	various	completed	no	N/A	analog, digital for bathymetry, gravity, magnetics	---	metadata for bathy, gravity, magnetics, seismic
S-5a-79-NC	N: 38.4646, S: 37.1538, W: -123.4518, E: -122.3008	USGS, Western Region	Dave Cacchione, Dave Drake	geophysical	none	3.5 kHz bathy, 12 kHz bathy, uniboom, seafloor camera, geoprobe	3.5 kHz bathy, 12 kHz bathy, uniboom, seafloor camera, geoprobe	various	completed	no	N/A	analog, digital for bathymetry, samples	---	metadata for bathy, cameras, samples, seismic
S-5b-79-NC	N: 38.5083, S: 36.6830, W: -124.1327, E: -121.9568	USGS, Western Region	Jim Gardner, Mike Field	geophysical and geological	none	3.5 kHz bathy, 12 kHz bathy, single-channel airgun	3.5 kHz bathy, 12 kHz bathy, single-channel airgun	various	completed	no	N/A	analog	---	metadata for bathy, samples, seismic
S-5c-79-NC	N: 37.9795, S: 36.6171, W: -123.4359, E: -121.7981	USGS, Western Region	Gary Greene	geophysical and geological	none	3.5 kHz bathy, dredge, gravity core, uniboom, sparker	3.5 kHz bathy, dredge, gravity core, uniboom, sparker	various	completed	no	N/A	analog	---	metadata for bathy, gravity, samples, seismic
S-15-79-NC	N: 39.5696, S: 34.8838, W: -126.2567, E: -121.8890	USGS, Western Region	Bill Normark	geophysical and geological	none	bathymetry, seismic	bathymetry, seismic	various	completed	no	N/A	analog, digital for bathymetry, seismic	---	Publications: (GeoRef# 1979-033350, 1980-023743, 1980-033660, 1982-027407, 1983-039948. 1984-038027. 1985-009012, 1985-009014, 1986-007946, 1986-015064, 1988-079977, 1990-039052, 1993-015239); metadata for bathymetry, samples, seismic