BENTHIC HABITAT DATA INVENTORY AND COLLECTION, HUMBOLDT BAY, CALIFORNIA

EA133C05CQ1052

Task Order 012

FINAL
Summary Report & Data Inventory

March 19th, 2007

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Purpose

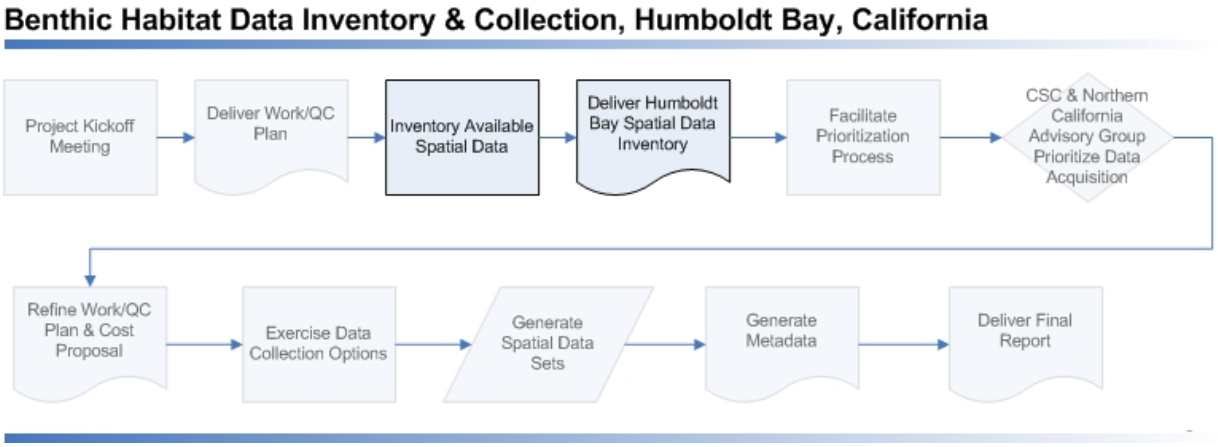
The purpose of this document is to summarize the information obtained during Task 3 "Conduct a Spatial Data Inventory for Humboldt Bay, California" for NOAA's Coastal Services Center ***Benthic Habitat Data Inventory and Collection, Humboldt Bay, California*** project. The information compiled during this task will be referenced by a group of northern California stakeholders to determine benthic habitat data acquisition priorities for Humboldt Bay. This deliverable includes two documents. First, this brief summary report which is broken down into two sections and an appendix. The Inventory Approach section provides an overview of the inventory process employed by Photo Science. The Data Inventory Summary section includes tables and charts of key summary statistics describing the content of the data inventory. The appendix includes screen captures from ArcMap that display the extent and coverage of each GIS dataset. An accompanying Microsoft Excel spreadsheet is the second document comprising this deliverable and represents the actual data inventory. Each dataset has been cataloged in the matrix for reference by the stakeholder group during the data prioritization process.

Inventory Approach

Overview

Photo Science completed Task 1 and Task 2 in preparation for Task 3 "Conduct a Spatial Data Inventory for Humboldt Bay, California" that is highlighted in Figure 1. The outcome of this inventory is providing a point of departure for subsequent data prioritization and acquisition tasks of the project.

Figure 1. Project Approach



Working with Center staff and regional representatives, Photo Science inventoried and cataloged available data using the specifications noted in Task 3 of our scope of services, as well as, those elements discussed during the kickoff meeting for this project. Table 1 lists the inventory elements included in the matrix.

Table 1. Data Inventory Elements

Inventory Element	Description
Dataset Title	Title of the dataset.
Data Description	Brief description of what the dataset represents.
Data Type/Format	List of the feature type (point, line, polygon) and file format (e.g. ArcInfo export coverage or shapefile).
Spatial Coverage	General spatial extent of the dataset.
Spatial Coverage Assessment	Relative ranking of “good”, “fair”, “poor”, or “undetermined” with respect to the spatial coverage of the dataset.
Eel River Coverage	Brief visual inspection of the dataset to determine if the spatial extent of the data include the Eel River.
Accessibility	Accessibility of the data with respect to the data being publicly available or proprietary information.
URL	Web site where a reference to the data can be found.
Time Period	Time period when the data were collected. **Note** that caveats to this particular inventory element are provided in the comments section of the spreadsheet.
Scale	Scale of the dataset (if available).
Data Contact Information	Reference to the dataset’s owner or steward.
Metadata	Notation on the metadata format for the dataset (FGDC Compliant Available, Non FGDC Compliant Metadata Record, No Metadata Available).
Metadata Assessment	Assessment of the completeness of the metadata record (Complete, Incomplete, No Metadata in Record).
Distribution Constraints	Notation with respect to any constraints regarding distribution or usage of the dataset.
Comments	Free form text for special notes, caveats, or other information of interest regarding the dataset.
Thematic Classification	General thematic classification of the dataset.

Approach

Photo Science performed Internet searches, made telephone contact, and emailed potential data sources. CSC provided Photo Science with an initial list of contacts that included these organizations:

- HB Harbor Recreation & Conservation District
- University of California Cooperative Extension, Sea Grant
- California Department of Fish & Game
- Humboldt State University
- California State Coastal Conservancy
- Pacific Marine Conservation Council
- Humboldt Area GIS Collaborative
- California State University, Monterey Bay
- USGS
- NOAA Fisheries

In some cases, these initial contacts provided Photo Science with additional points of contact with whom our Team corresponded with during this Task. Table 2 lists each person and organization that Photo Science contacted and the outcome of that correspondence.

Table 2. Data Contacts

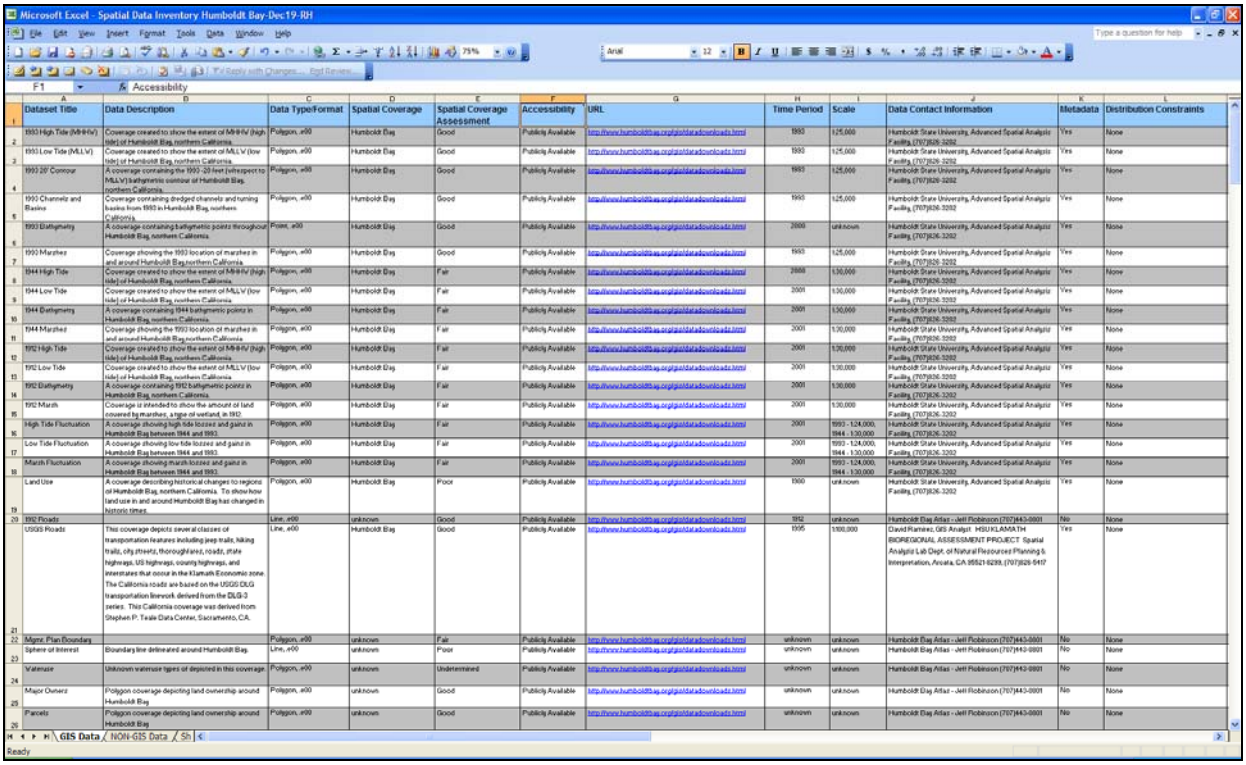
Advisor	Organization	Date Contacted	Responded	Data Available	Data Evaluated
Jeff Robinson	HB Harbor Recreation & Conservation District	11/29/2006	Yes	Yes	Yes
Susan Schlosser	University of California Cooperative Extension, Sea Grant	11/29/2006	Yes	Yes	Yes
Mark Wheetley	CA Department of Fish & Game	11/29/2006	No	Yes	Yes
Frank Shaughnessy	Humboldt State University	12/7/2006	Yes	Yes	Yes
Steve Steinberg	Humboldt State University	11/29/2006	Yes	Yes	Yes
Moira McEnespy	CA State Coastal Conservancy	11/29/2006	No		
Sheila Semans	CA State Coastal Conservancy	11/29/2006	Yes	No	No
Chinmaya Lewis	Humboldt Area GIS Collaborative	11/29/2006	No	Yes	Yes
Rikk Kvitek	CSU Monterey Bay	12/7/2006	Yes	Yes	Yes
Carrie Bretz	CSU Monterey Bay	12/8/2006	Yes	Yes	Yes
Guy Cochrane	USGS	12/7/2006	Yes	No	No
Bryant Chesney	NOAA Fisheries	11/29/2006	No		
Linda Miller	CA Department of Fish & Game	12/7/2006	Yes	Yes	Yes
Andrea Pickart	US Fish & Wildlife Service	12/8/2006	Yes	Yes	Yes

Please note that Andrea Pickart sent a DVD after the inventory had been completed for stakeholder workshop. Photo Science has since evaluated these data prior and updated the spreadsheet accordingly. Linda Miller advised that the county maintained spatial data (parcels and zoning info). However, these data were not evaluated since similar data had been found elsewhere online.

In addition to contacting these data stewards, Photo Science referred to the IMSG/PSGS ***"Summary List of Existing Conservation Geospatial Data, Northern California"*** that was produced in December 2005. Photo Science cross-referenced this list with the inventory that our Team produced for this project.

Photo Science populated a Microsoft Excel spreadsheet with information that characterizes the type of data available, accessibility, and the spatial extent of the datasets (Figure 2). While this spreadsheet does not replace a more rigorous data suitability analysis, it will provide the northern California stakeholder group with an inventory and cursory qualification of the best available data for Humboldt Bay.

Figure 2. Structure of the Data Inventory



Upon completion of the inventory, Photo Science summarized the information obtained during this task. The summary information may be used by CSC and / or the stakeholder to help understand the type and extent of available data in Humboldt Bay.

Data Inventory Summary

General Characteristics

Photo Science inventoried a total of 149 GIS datasets and 12 non-GIS datasets that relate to Humboldt Bay. Approximately 133 of the datasets inventoried by Photo Science are publicly available. Some data stewards did request the appropriate citation if the data were used by other organizations. Approximately 134 datasets have a reference to an online information source. In many cases, these URLs are the actual location for data downloads.

The datasets represent all feature types: polygons, lines and points. Surfaces (grids) are available for some datasets as well. Lastly, there are potentially relevant datasets stored as text files, PDF, or MS Excel workbooks.

Metadata records and Photo Science's visual inspections indicate that the spatial coverage of these datasets range from the entire coast of California to specific areas within Humboldt Bay. In several instances, the spatial extent of the datasets could not be determined during the inventory process. CSC and its partners are encouraged to read the short narratives in the comments field to gather specific information regarding any particular dataset.

Summary Information

In an effort to illustrate key elements of the data inventory, Photo Science has generated a series of summary graphics. This summary information provides some insight into the characteristics and potential value these data may have to the Humboldt Bay EBM project.

Figure 3 indicates the number and percentage of datasets by Thematic Classification. Of the total number of datasets inventoried during this process, approximately 33% may have a habitat-related purpose.

Figure 3. Datasets by Thematic Classification

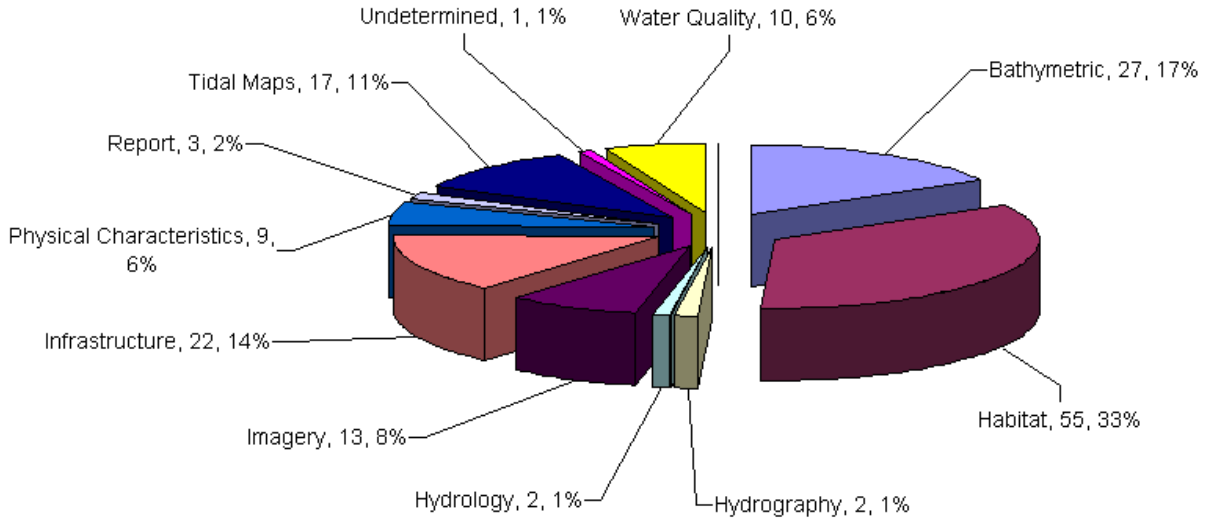
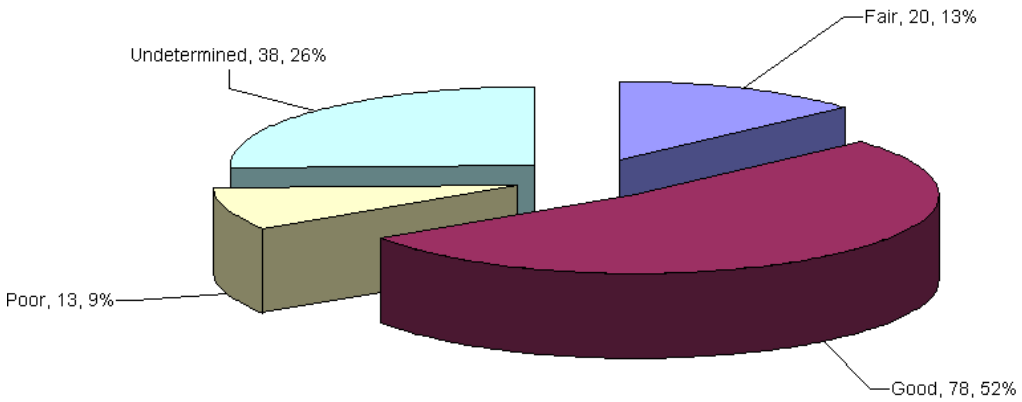


Photo Science performed a cursory assessment of the spatial coverage of each dataset. This was assessment was performed through visual inspections in ESRI's ArcGIS ArcMap environment. Photo Science classified the spatial coverage of each dataset as Good, Fair, Poor, or Undetermined. In general, datasets were classified as "good" if the mapped data covered most of Humboldt Bay and appeared to be comprehensive. "Fair" datasets may have mapped data that cover most of the study area but there were fewer data records; indicating a less "rich" dataset. Likewise, datasets that included a dense number of mapped data but only covered a portion of the study area were classified as "fair." Those datasets whose spatial extent were limited or the number of mapped features were few, were classified as "poor." In some instances, the spatial extent of the dataset appeared to be very broad. Therefore, it was unclear as to the true spatial extent of these data. For these datasets, Photo Science rated them as "Undetermined." The Photo Science GIS Analysts used their best professional judgment to determine how "rich" the dataset was with respect to number of records and spatial coverage across the study area. Appendix A includes screen captures taken while performing these assessments.

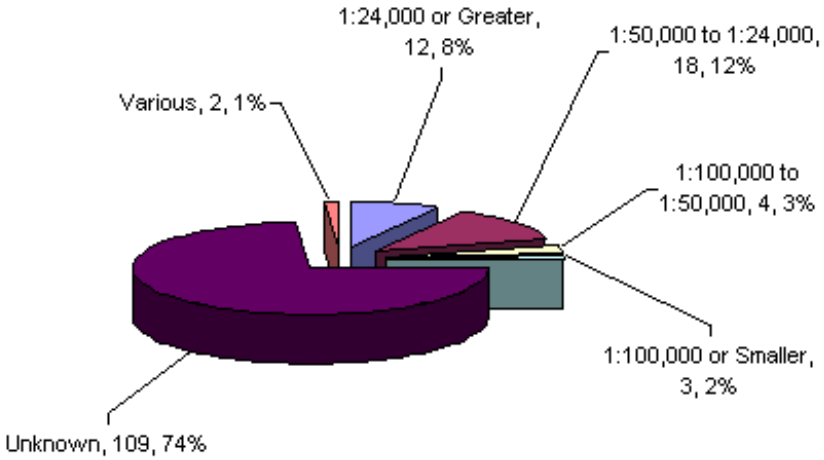
Figure 4 summarizes this assessment and indicates that approximately 52% of the datasets inventoried have a good spatial coverage for Humboldt Bay.

Figure 4. Datasets by Spatial Assessment



Where possible, Photo Science cataloged the source scale information for each dataset. Figure 5 indicates that approximately 74% of the datasets' source scale is unknown given the existing metadata or other source documentation *Only GIS datasets are summarized here.

Figure 5. Datasets by Source Scale Range



In an effort to understand what timeframe these datasets represent, Photo Science cataloged the creation dates for the datasets. The Photo Science Team relied upon metadata and other source documentation when populating the inventory with this information. As Figure 6 indicates, well over half of the datasets available are as recent as 2001 through the present.

Figure 6. Datasets by Timeframe

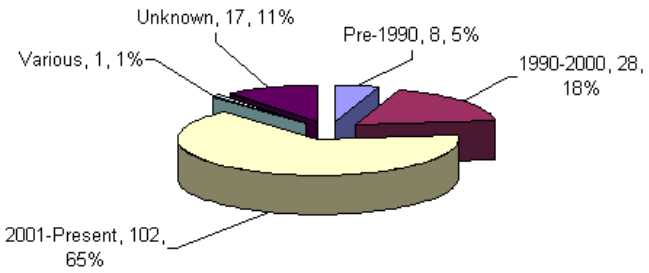
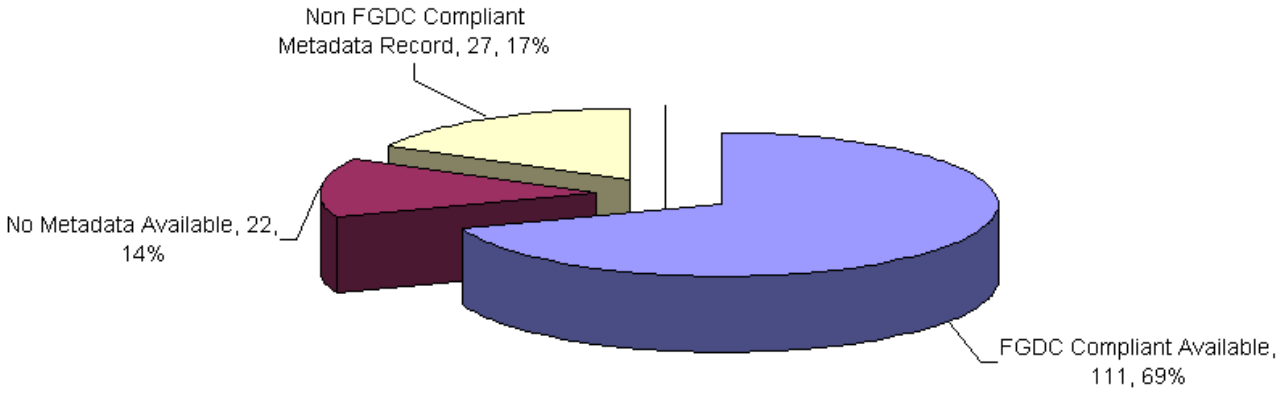


Photo Science made every effort to obtain and review documentation regarding the datasets being inventoried as part of this process. Fortunately, Nearly 70% of the datasets inventoried include an FGDC-compliant metadata record with respect to metadata format (Figure 7).

Figure 7. Datasets by Metadata Availability



The consistency of the information within the metadata records varied from dataset to dataset. In general, the FGDC-compliant metadata records were fairly complete. However, there are several instances (e.g. source scale notation) where metadata entries included “unknown” for a particular metadata element.

Summary of Available Habitat Datasets

1. Photo Science assigned a Thematic Classification of “habitat” to 55 of the 161 datasets.
2. Approximately 80% of the habitat-related data include FGDC-compliant metadata records with respect to metadata format.
3. There are no distribution constraints on any of the 55 data layers classified as habitat-related.
4. A small number of data stewards noted caveats or use restrictions on selected datasets.

5. A brief review of the metadata, and visual inspection within ArcMap, indicates that 49 of the 55 habitat-related datasets represent species ranges. Therefore, these data may represent potential habitat areas versus actual mapped features.

6. Approximately 70% of the habitat dataset spatial coverage assessments resulted in a poor or undetermined value.

7. Approximately 90% of the dataset source scale is undetermined with only 3 datasets' source scale noted in the metadata records as being 1:24,000 or larger.

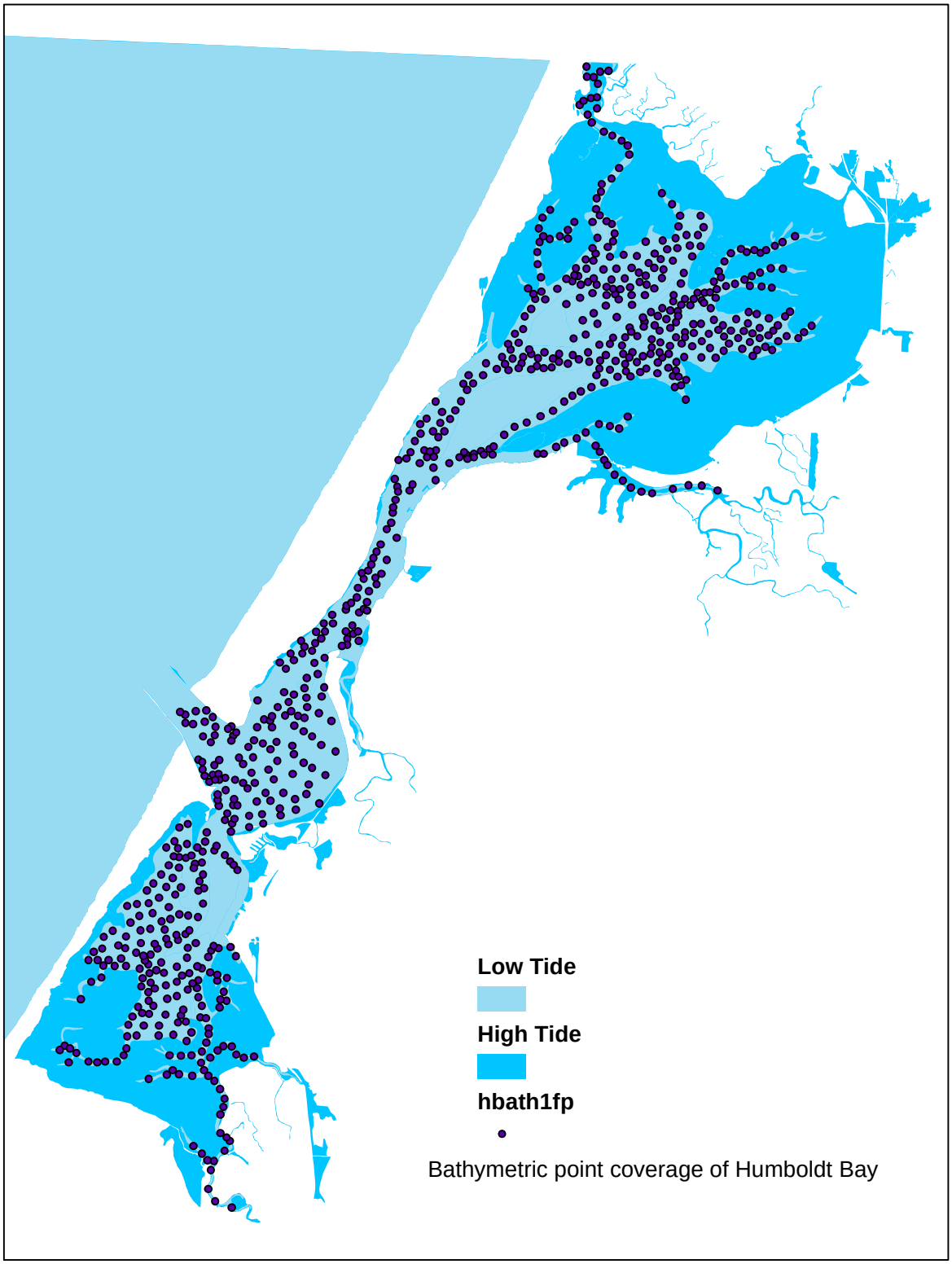
8. Approximately 78% of the habitat-related datasets have been created since 2001. This relatively recent time period may present an opportunity to consult with the data creators or the source material used to derive those datasets.

There are a number of agencies producing quality GIS datasets. For such a small region Humboldt Bay is data rich, but many of those data require closer suitability analyses and additional data documentation to determine their appropriateness for the Humboldt Bay EBM Program.

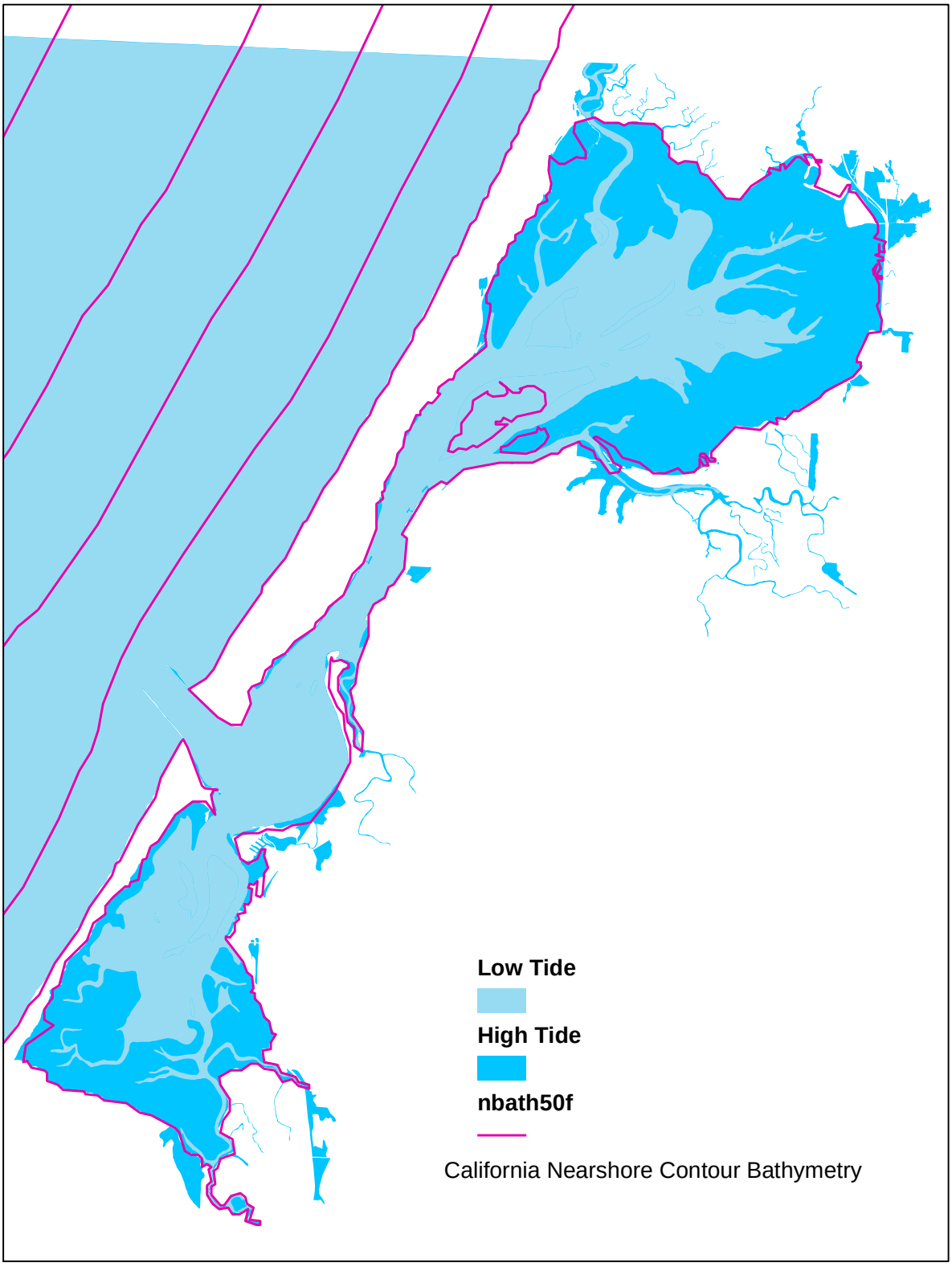
Next Steps

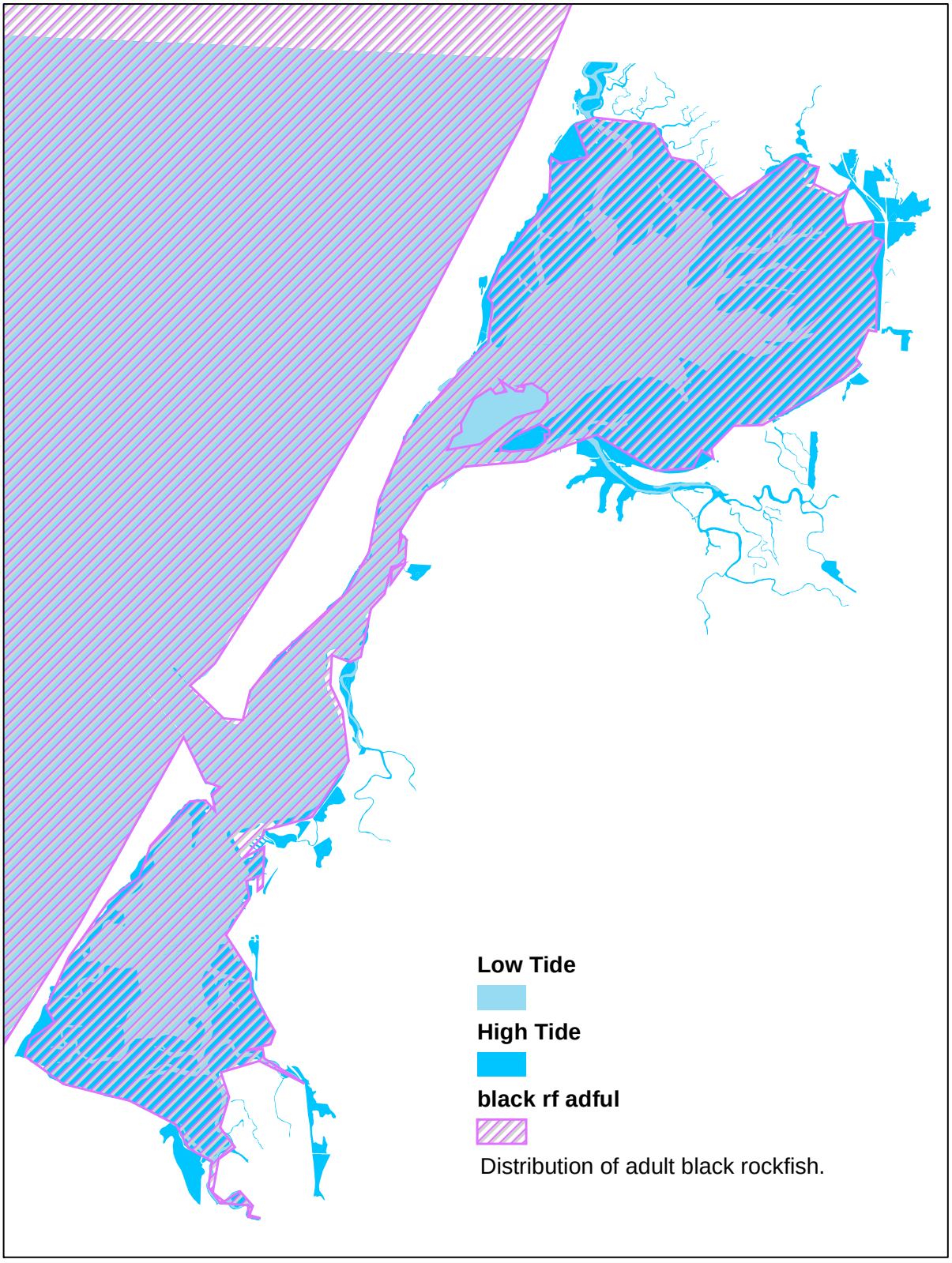
Photo Science has submitted cost options and recommendations to capture aerial photography and delineate benthic polygons from that photography. We will continue to support CSC as it works with the Humboldt Bay stakeholders to determine the appropriate course of action in capturing these data.

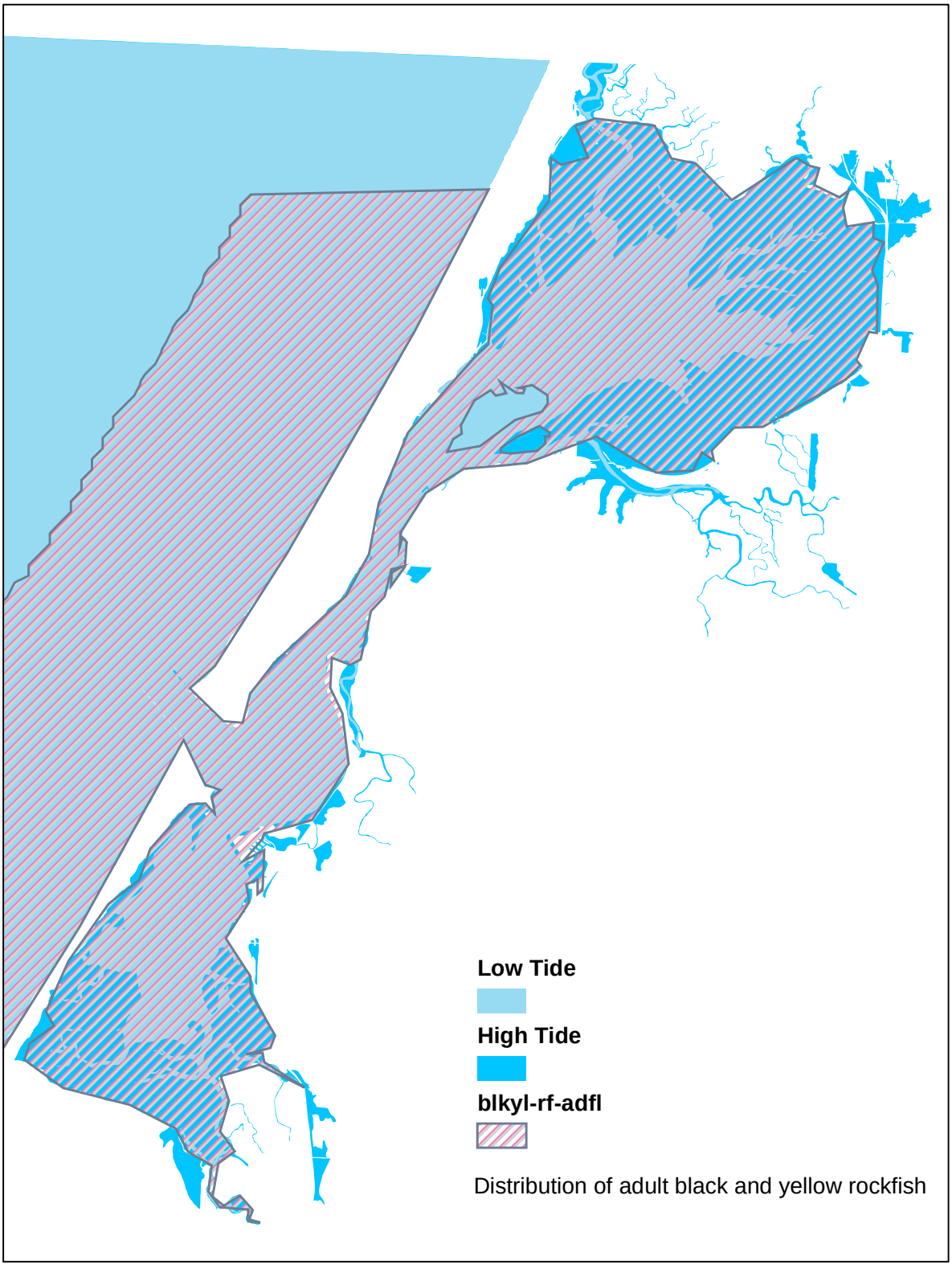
Appendix A



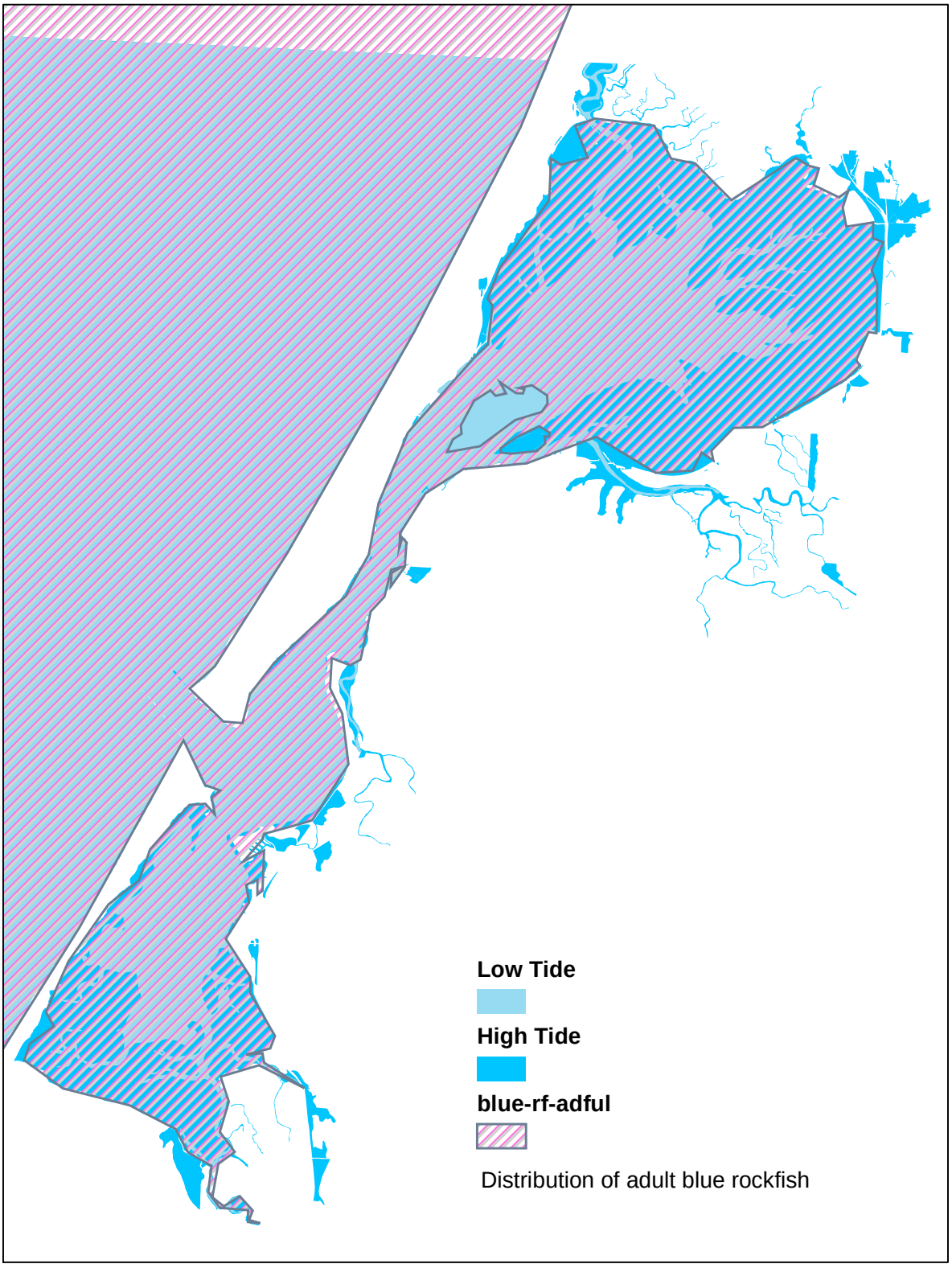
Bathymetric point coverage of Humboldt Bay

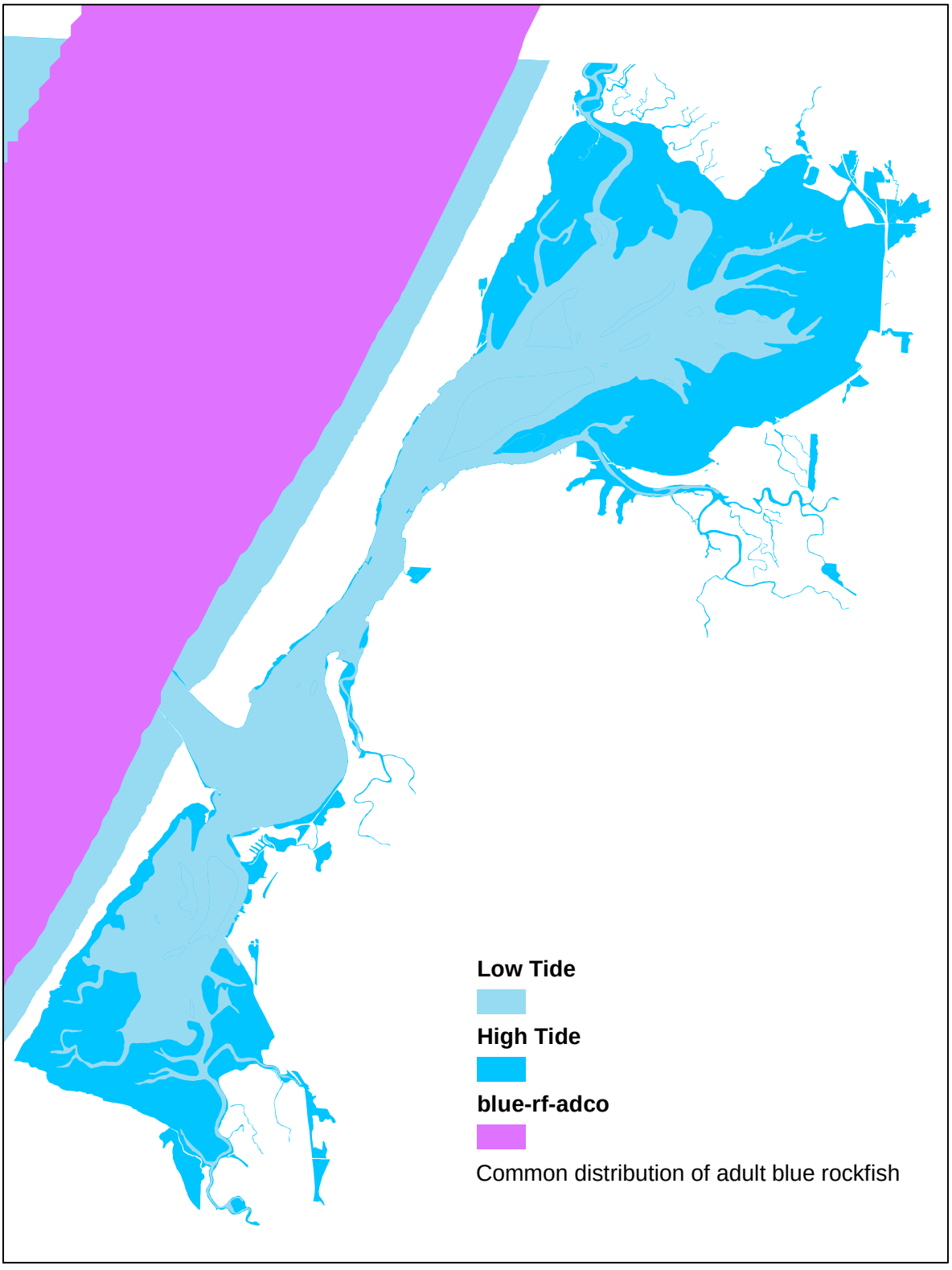

Low Tide
High Tide
nbath50f
California Nearshore Contour Bathymetry

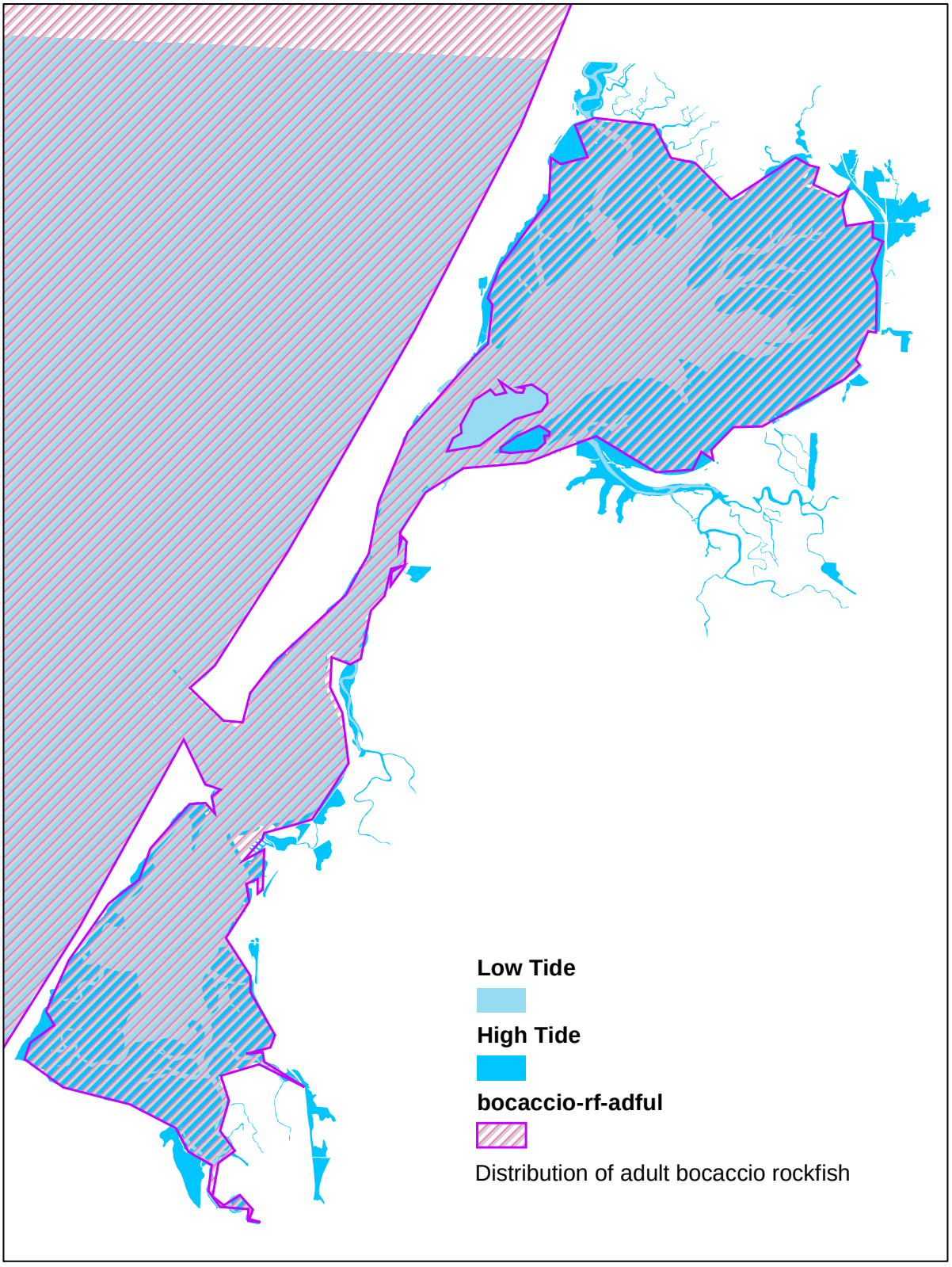

Low Tide
High Tide
black rf adful
Distribution of adult black rockfish.

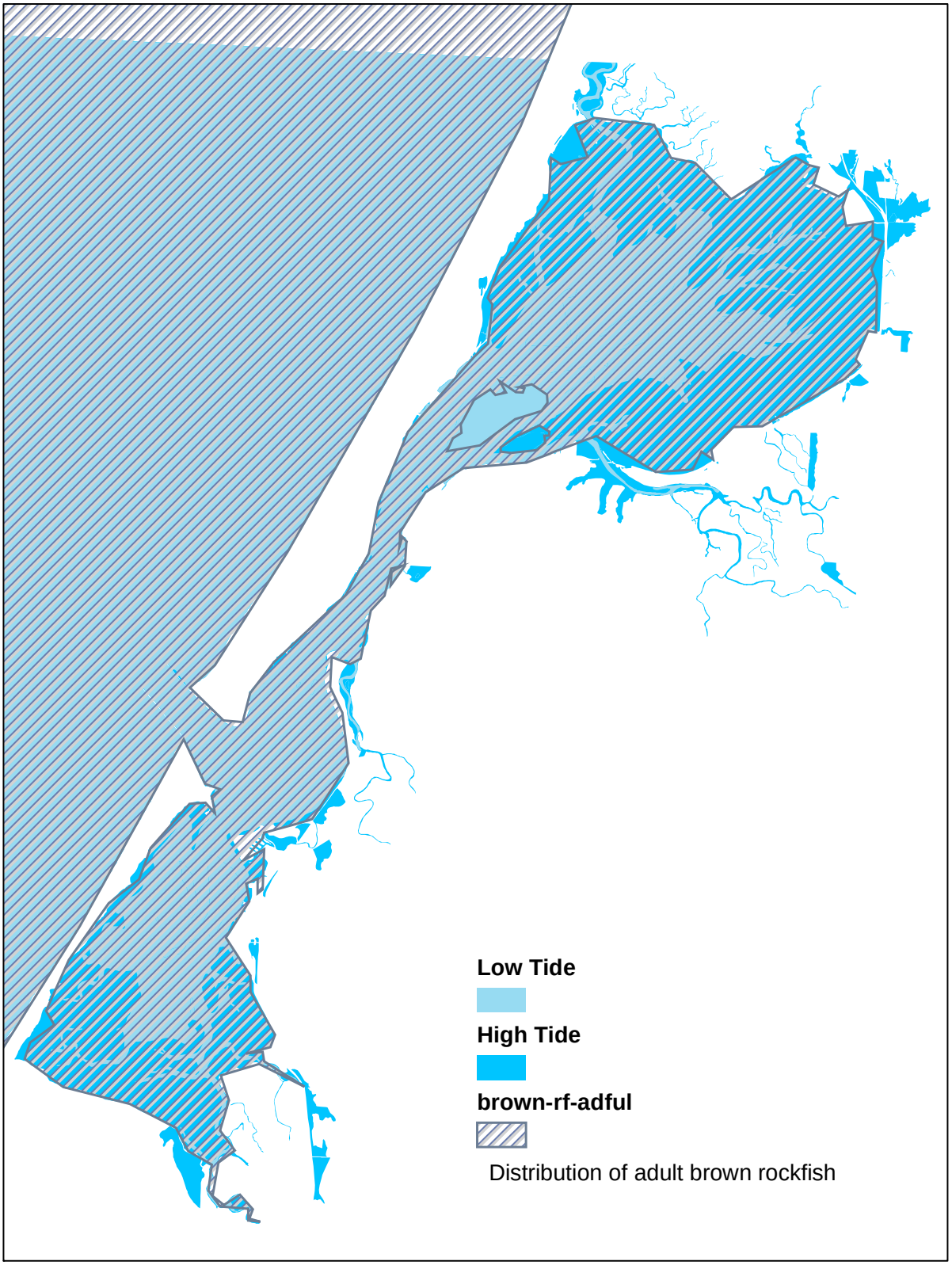


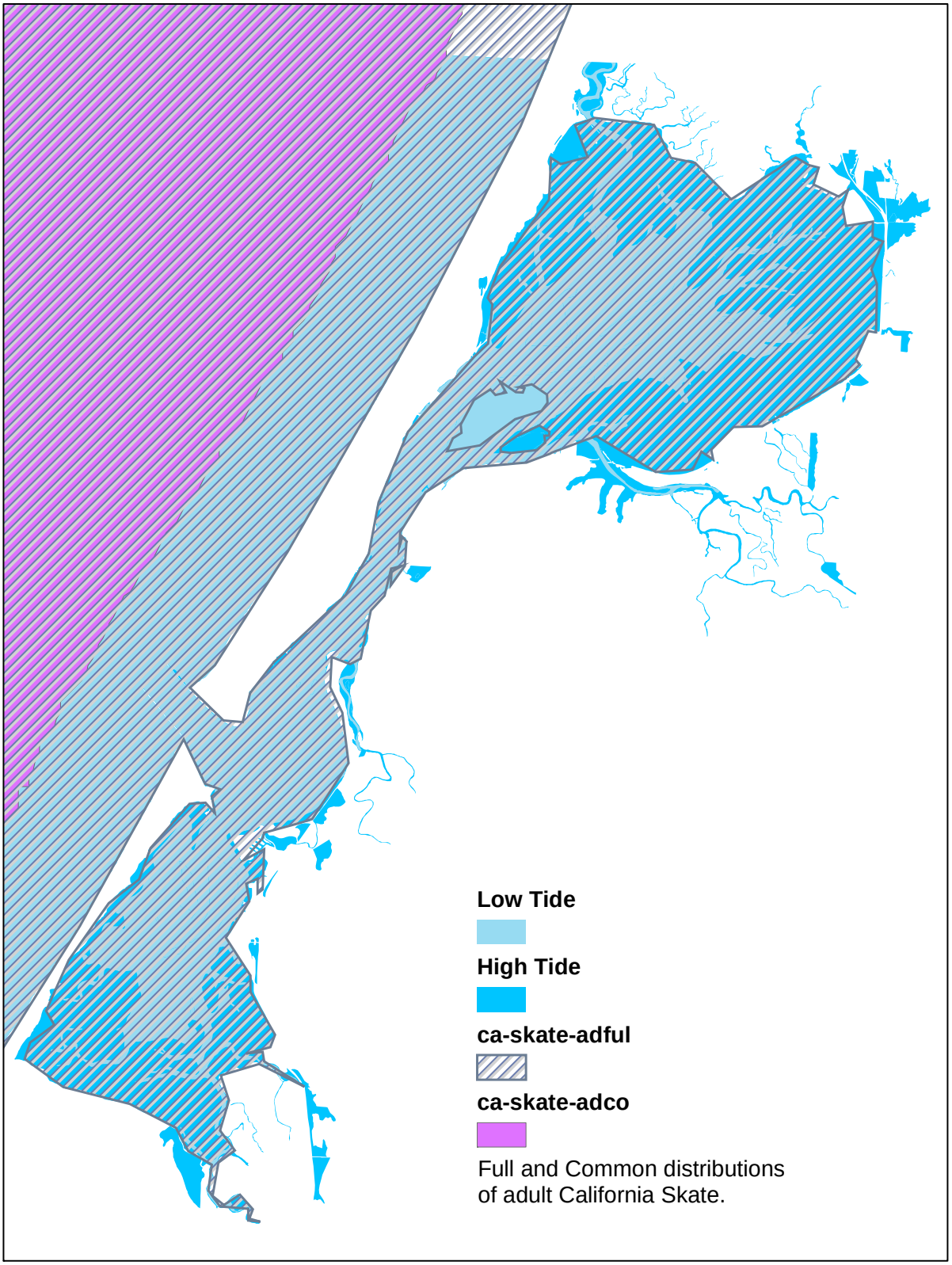
Distribution of adult black and yellow rockfish

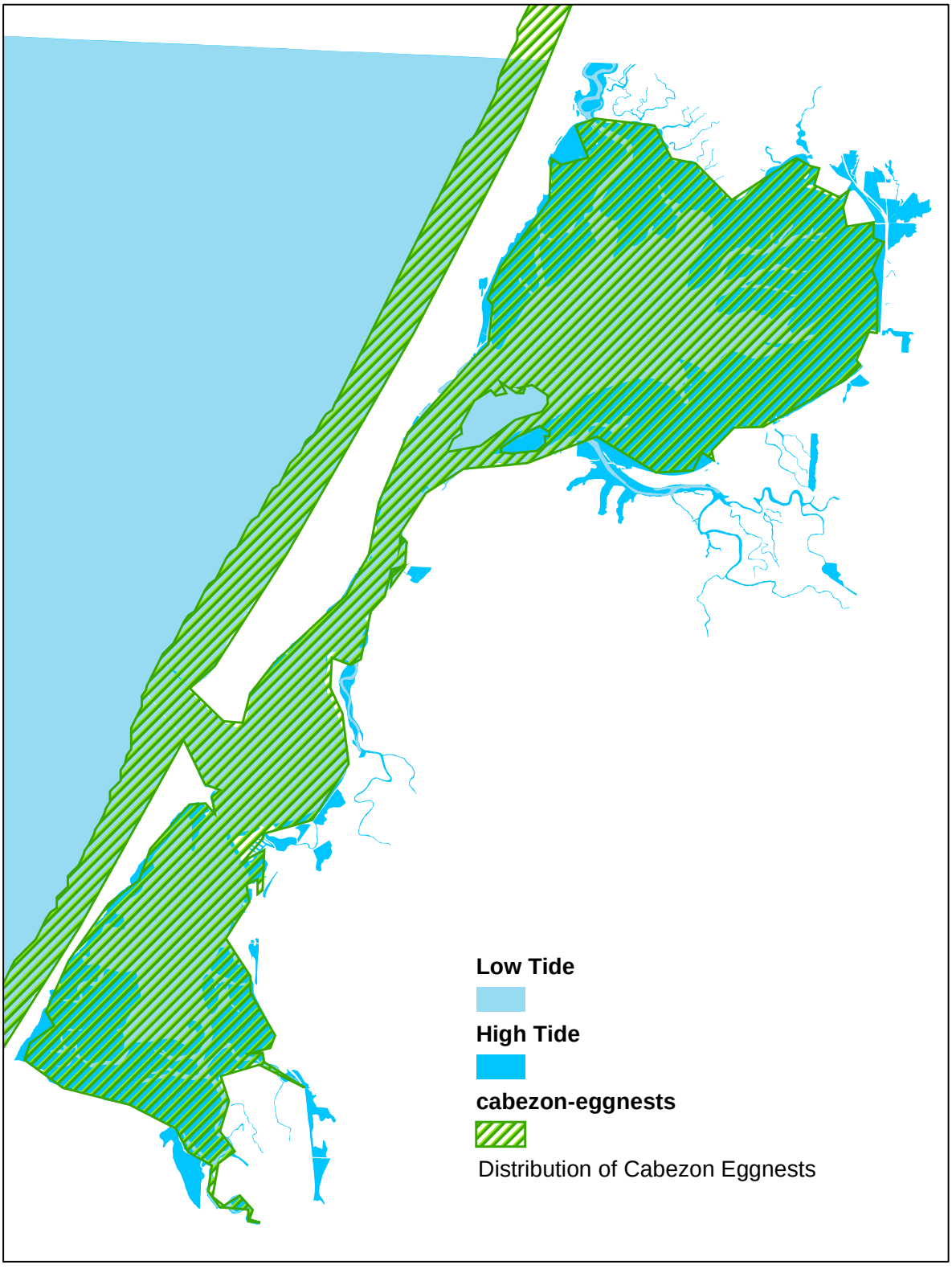

Low Tide
High Tide
blue-rf-adful
Distribution of adult blue rockfish

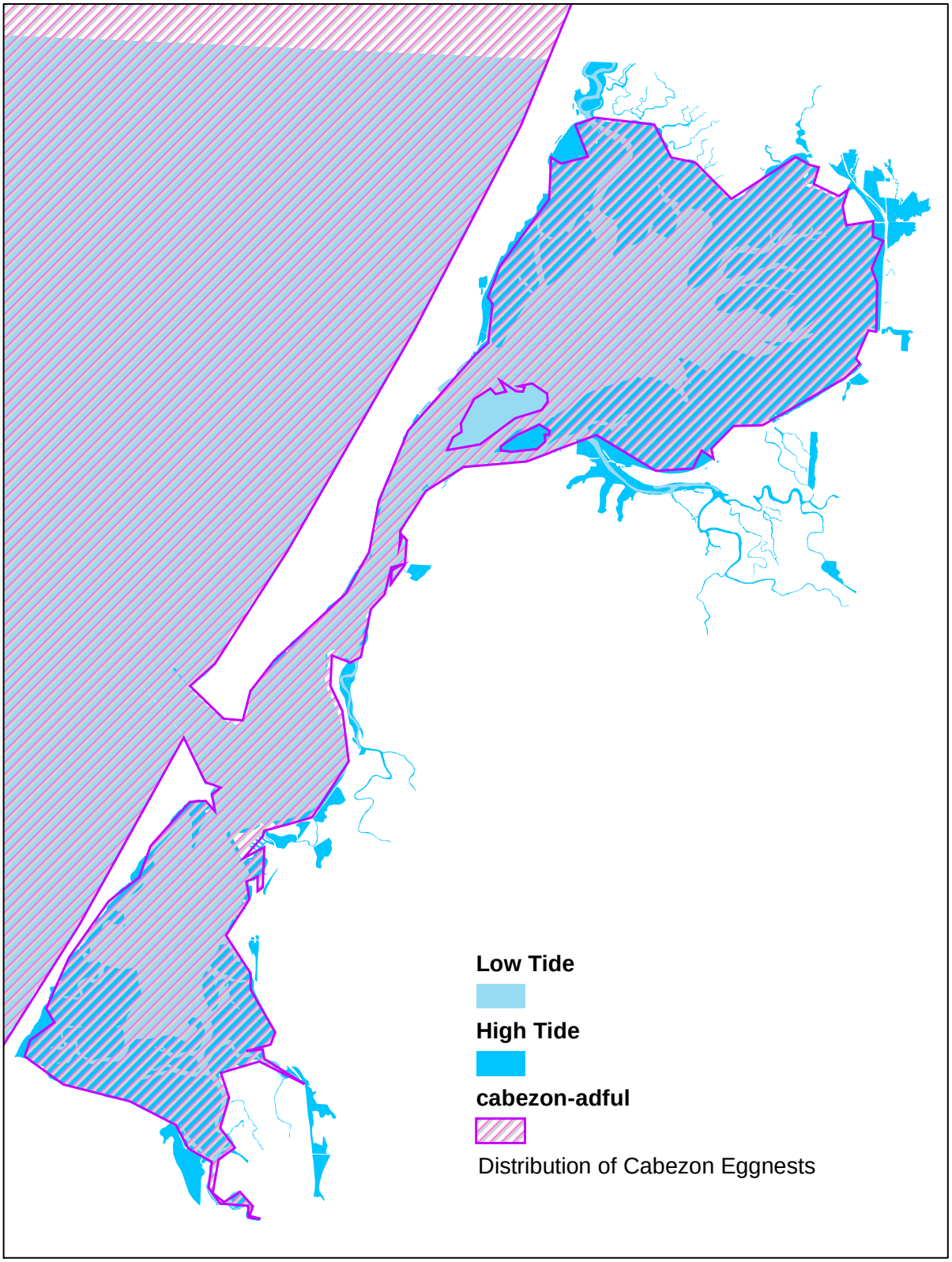

Low Tide
High Tide
blue-rf-adco
Common distribution of adult blue rockfish

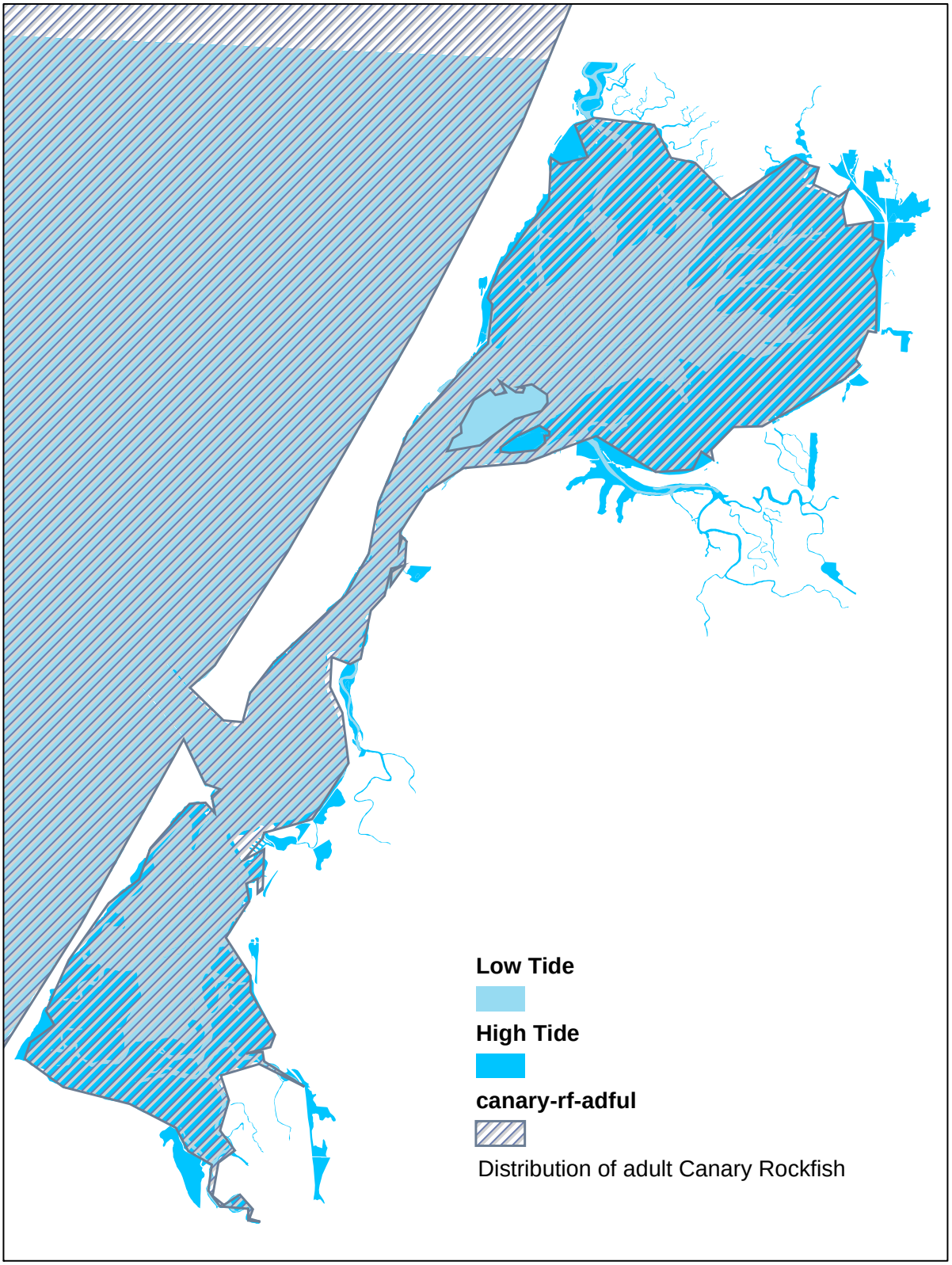

Low Tide
High Tide
bocaccio-rf-adful
Distribution of adult bocaccio rockfish

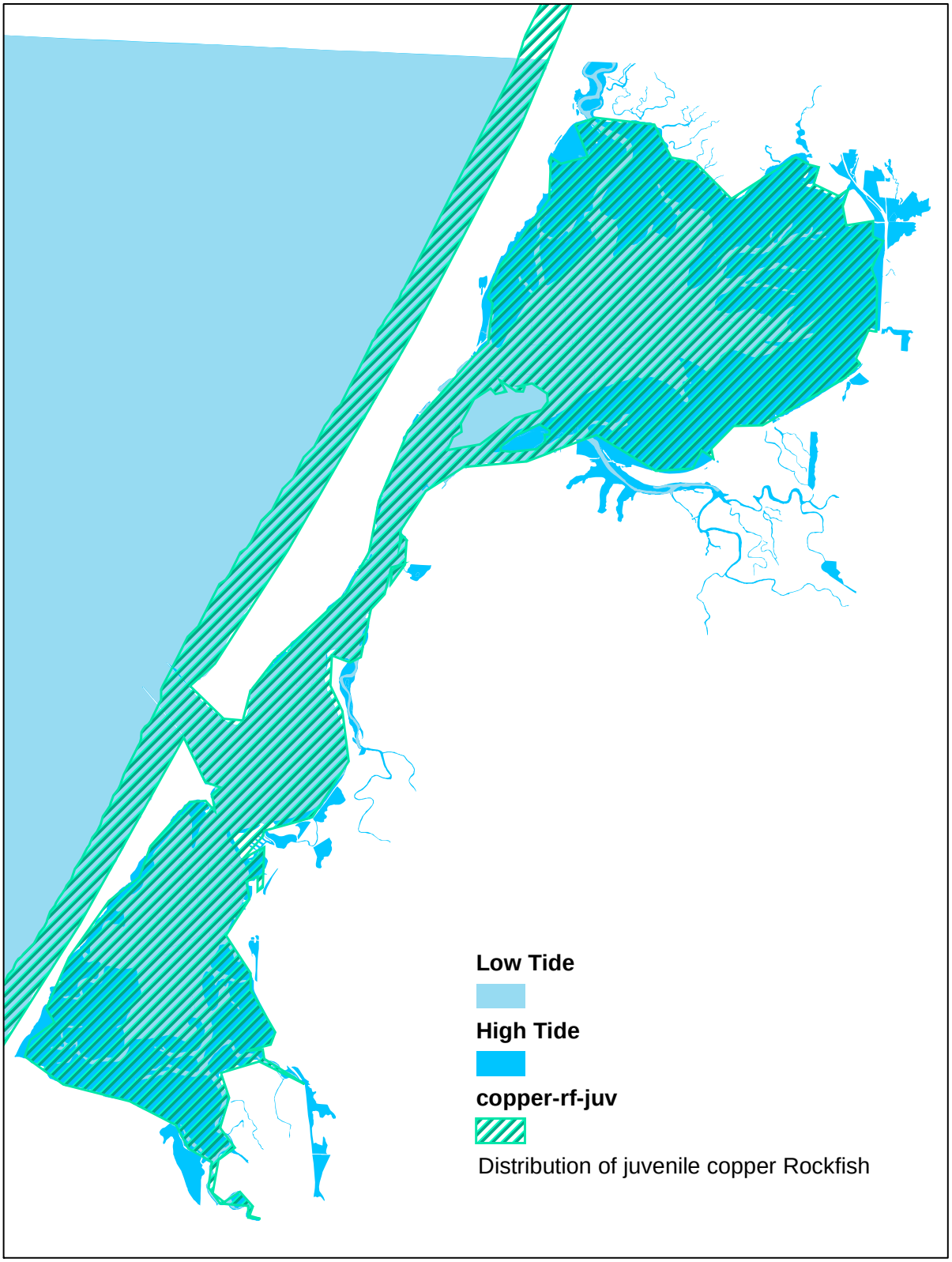

Low Tide
High Tide
brown-rf-adful
Distribution of adult brown rockfish

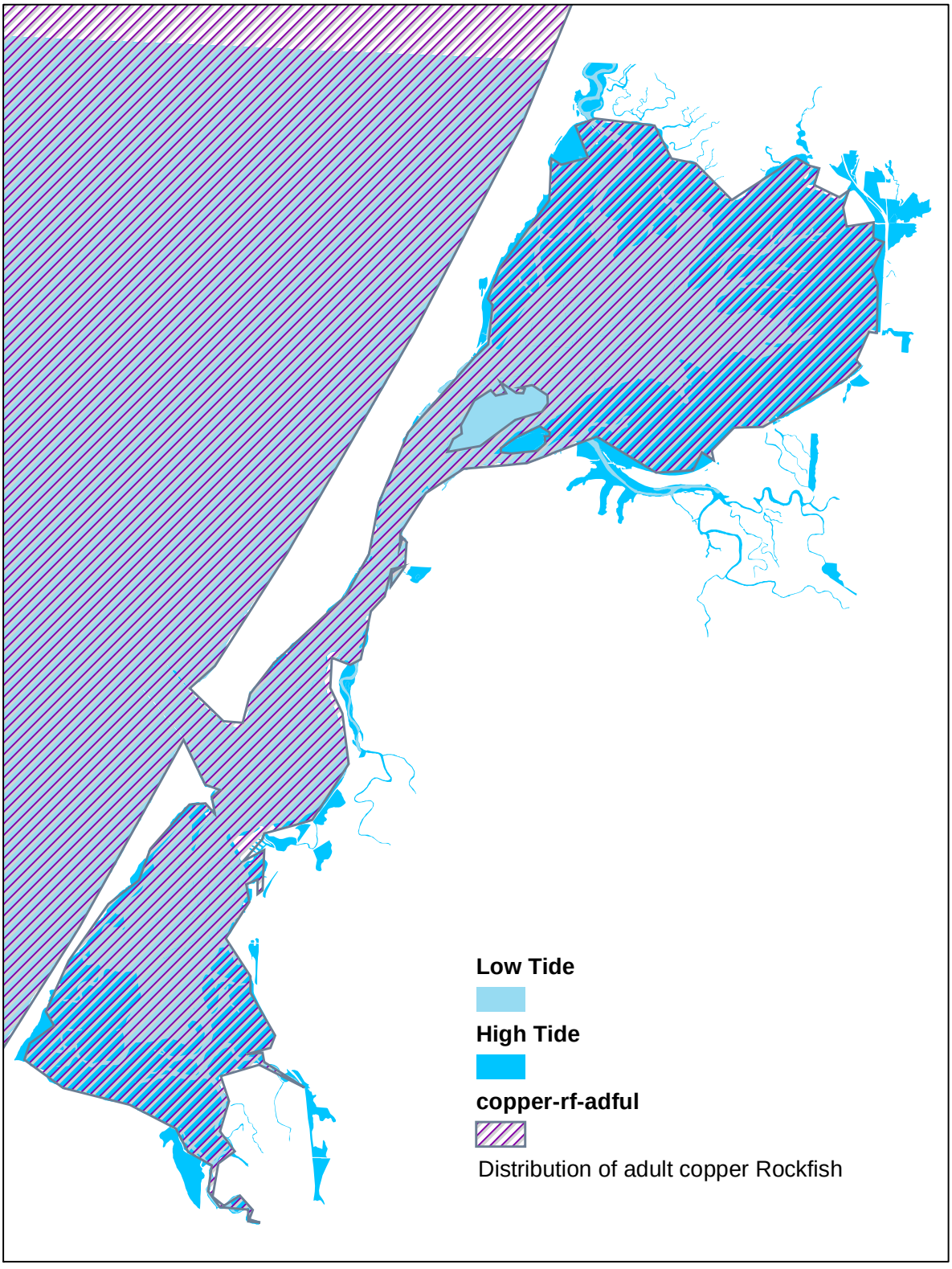

Low Tide
High Tide
ca-skate-adful
ca-skate-adco
Full and Common distributions
of adult California Skate.

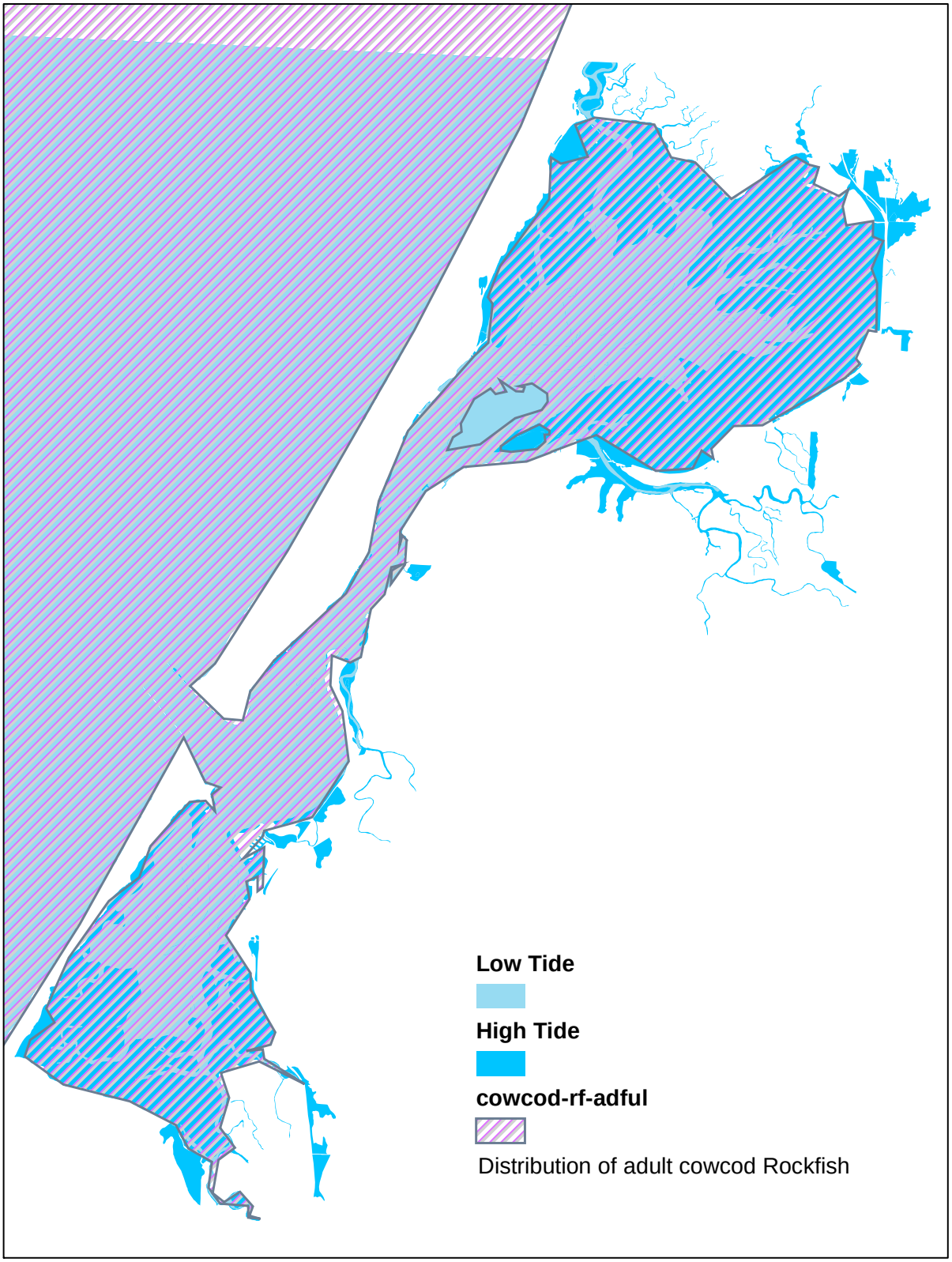

Low Tide
High Tide
cabezon-eggnests
Distribution of Cabezon Eggnests


Low Tide
High Tide
cabezon-adful
Distribution of Cabezon Eggnests

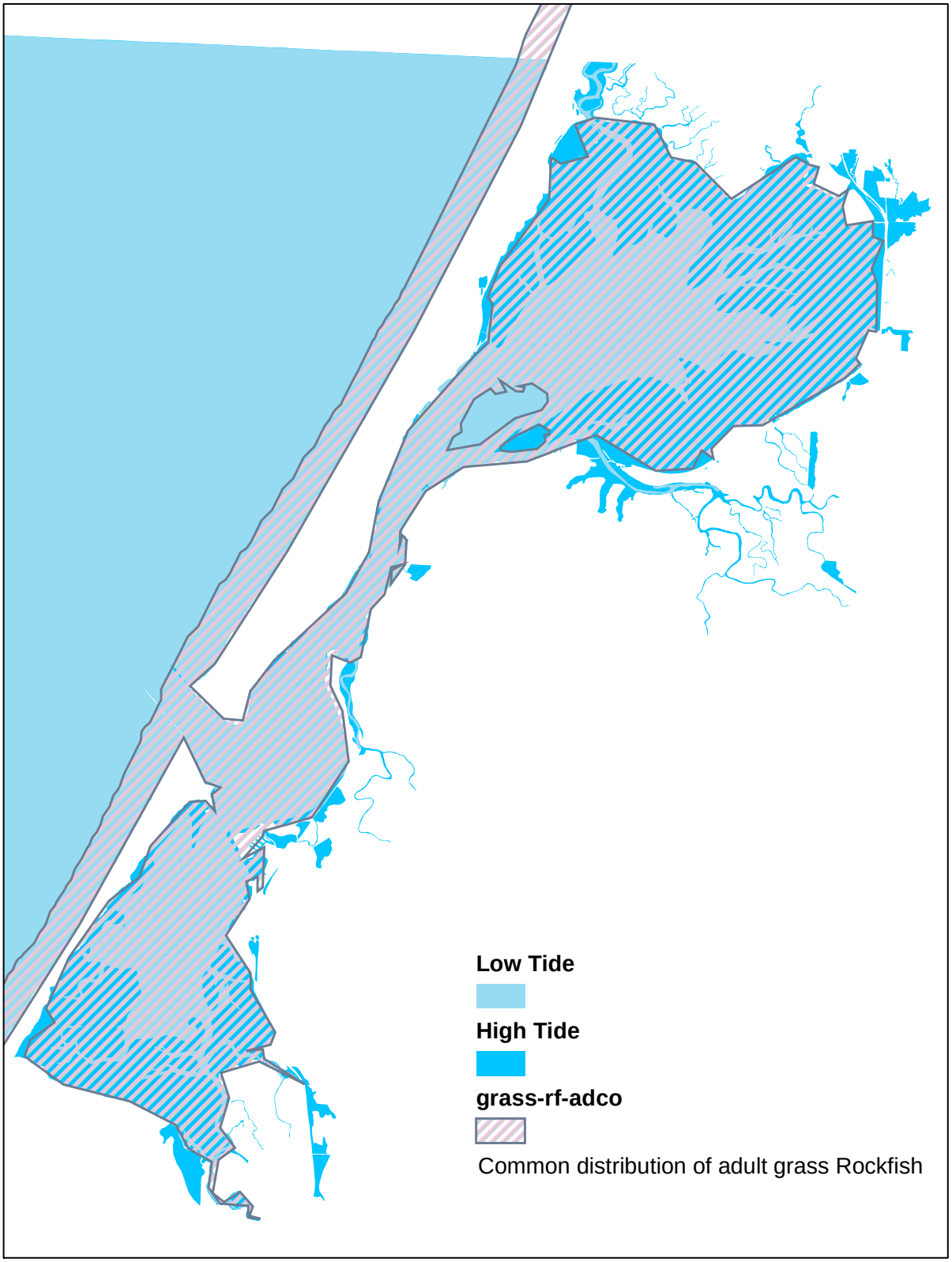

Low Tide
High Tide
canary-rf-adful
Distribution of adult Canary Rockfish

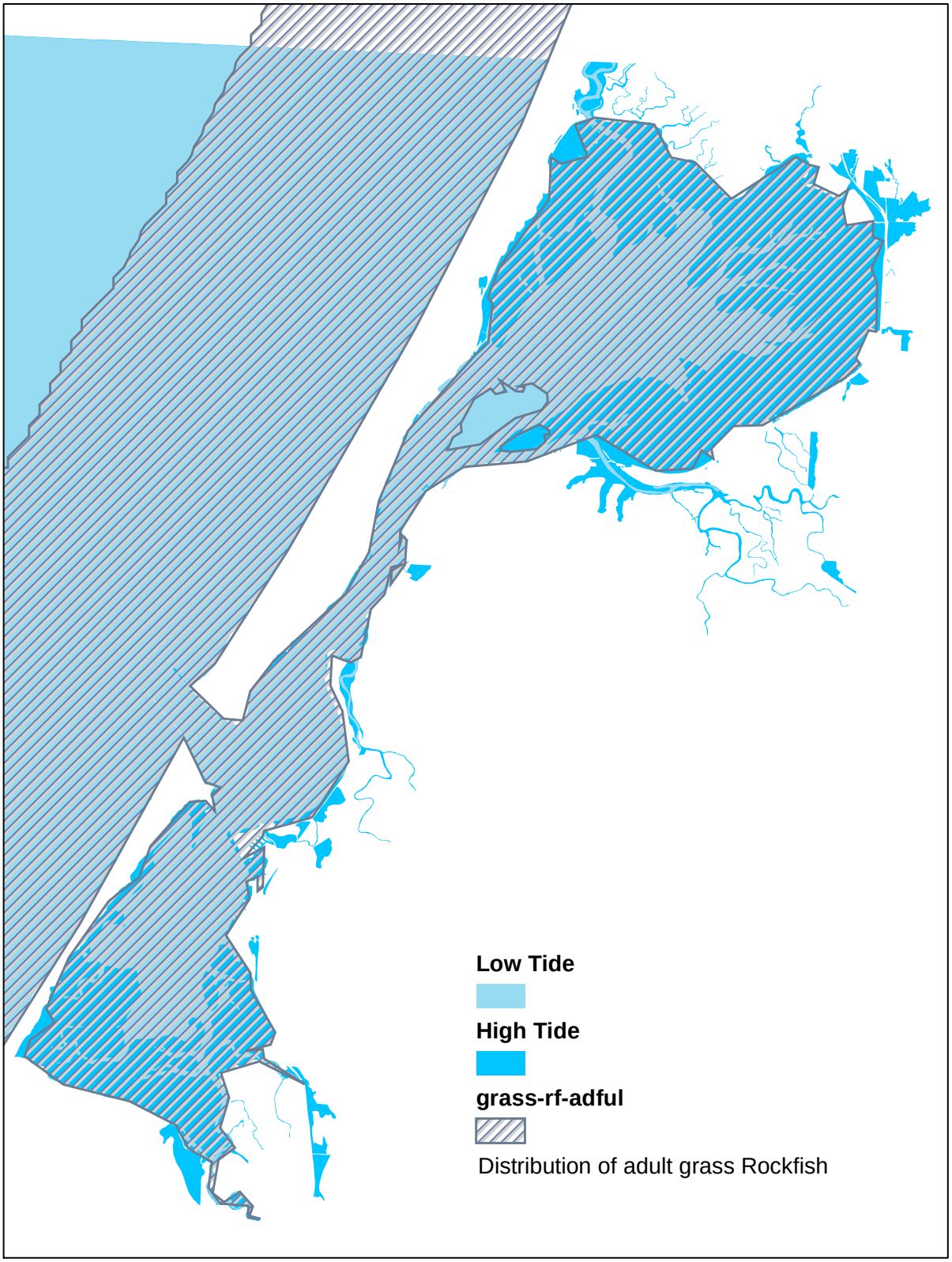

Low Tide
High Tide
copper-rf-juv
Distribution of juvenile copper Rockfish

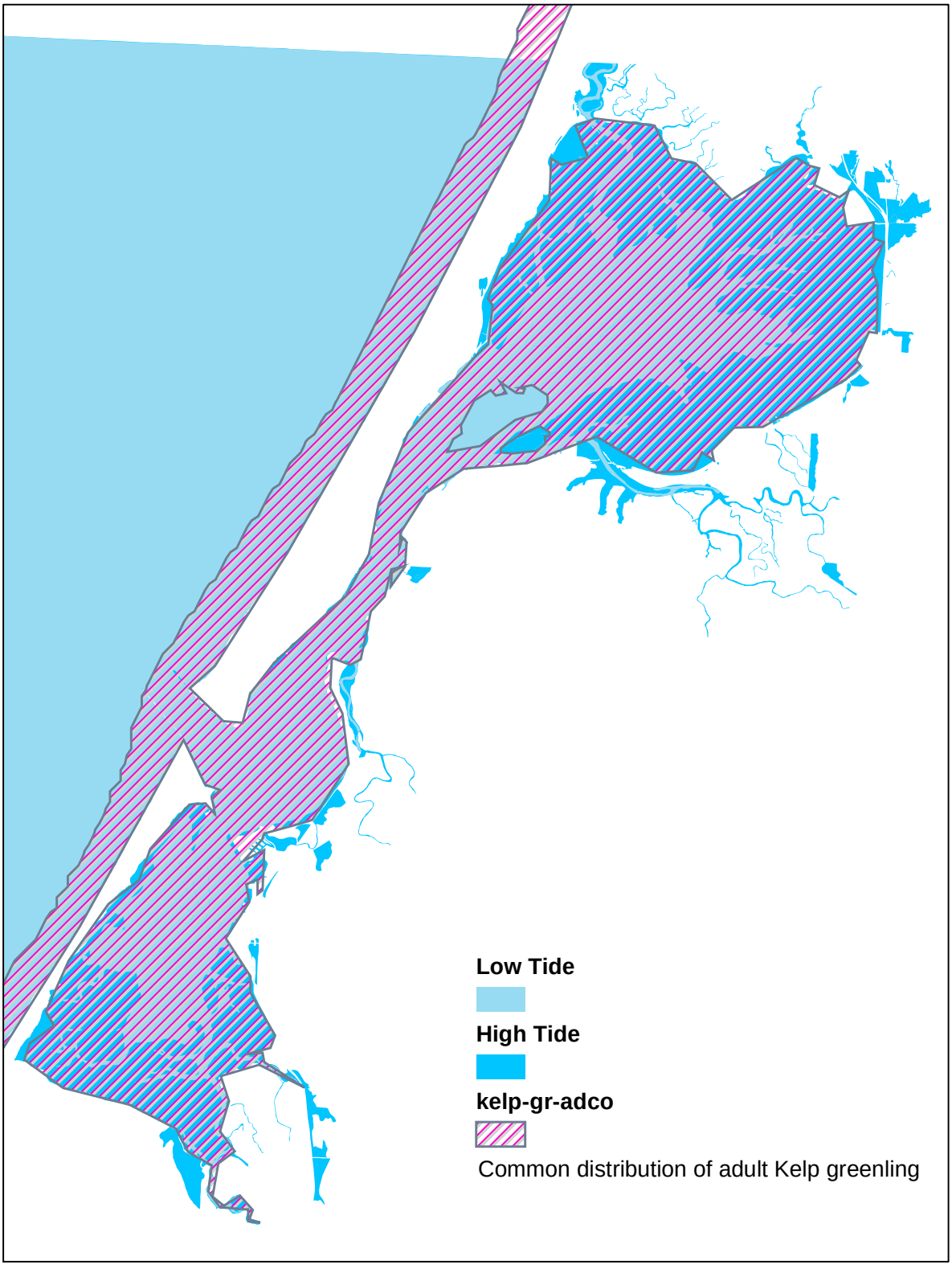

Low Tide
High Tide
copper-rf-adful
Distribution of adult copper Rockfish

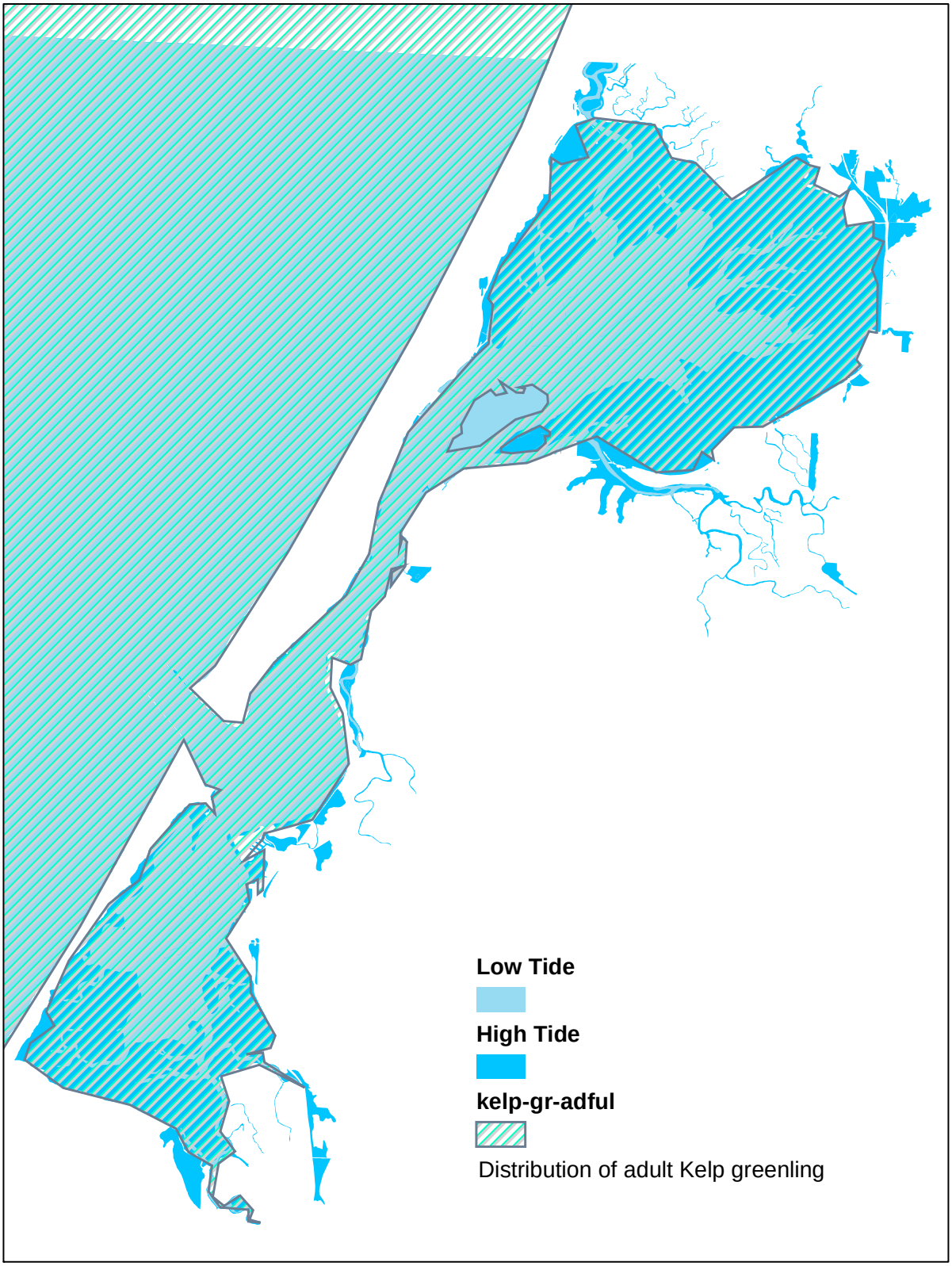

Low Tide
High Tide
cowcod-rf-adful
Distribution of adult cowcod Rockfish

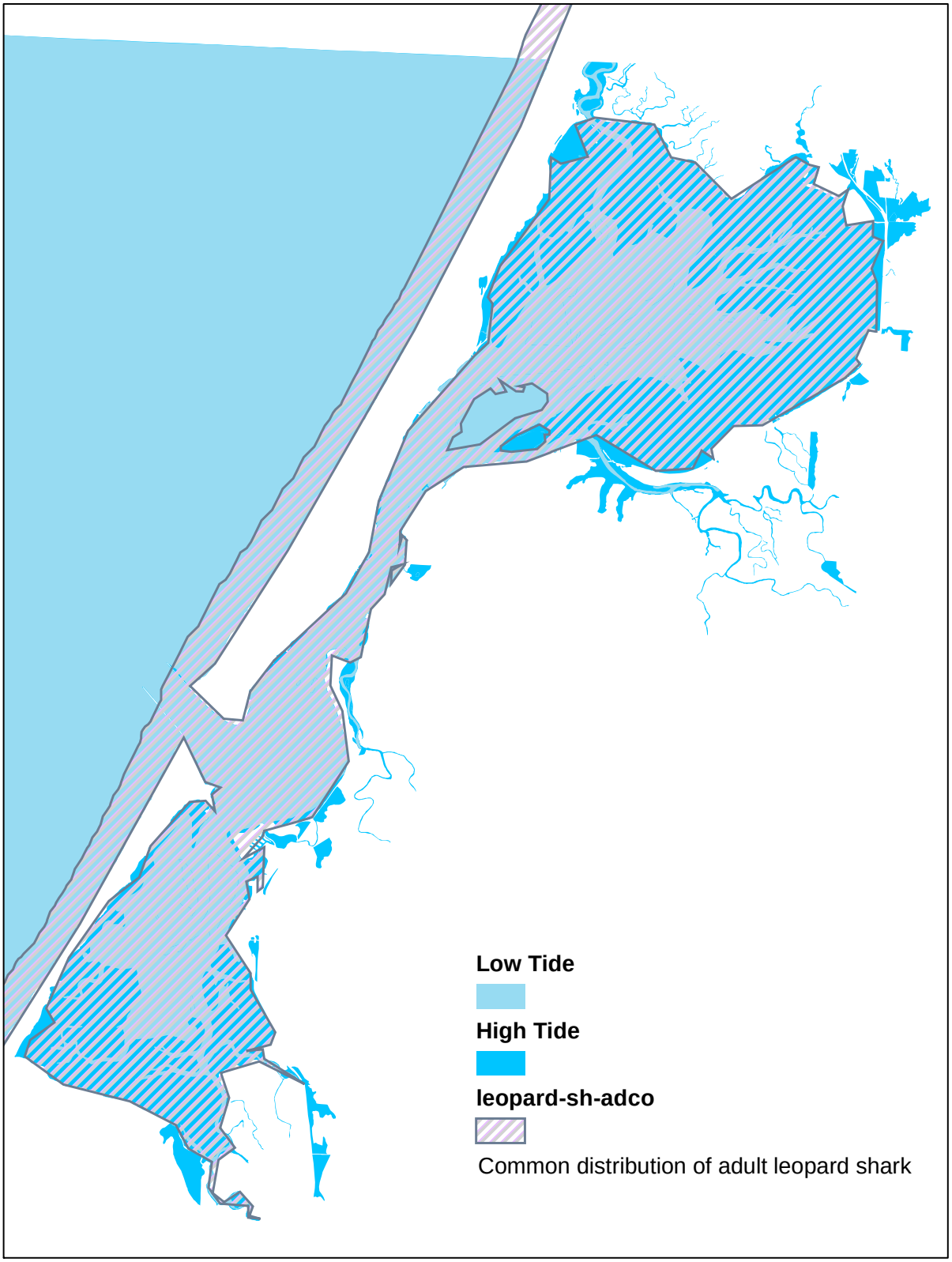

Low Tide
High Tide
gopher-rf-adful
Distribution of adult Gopher Rockfish

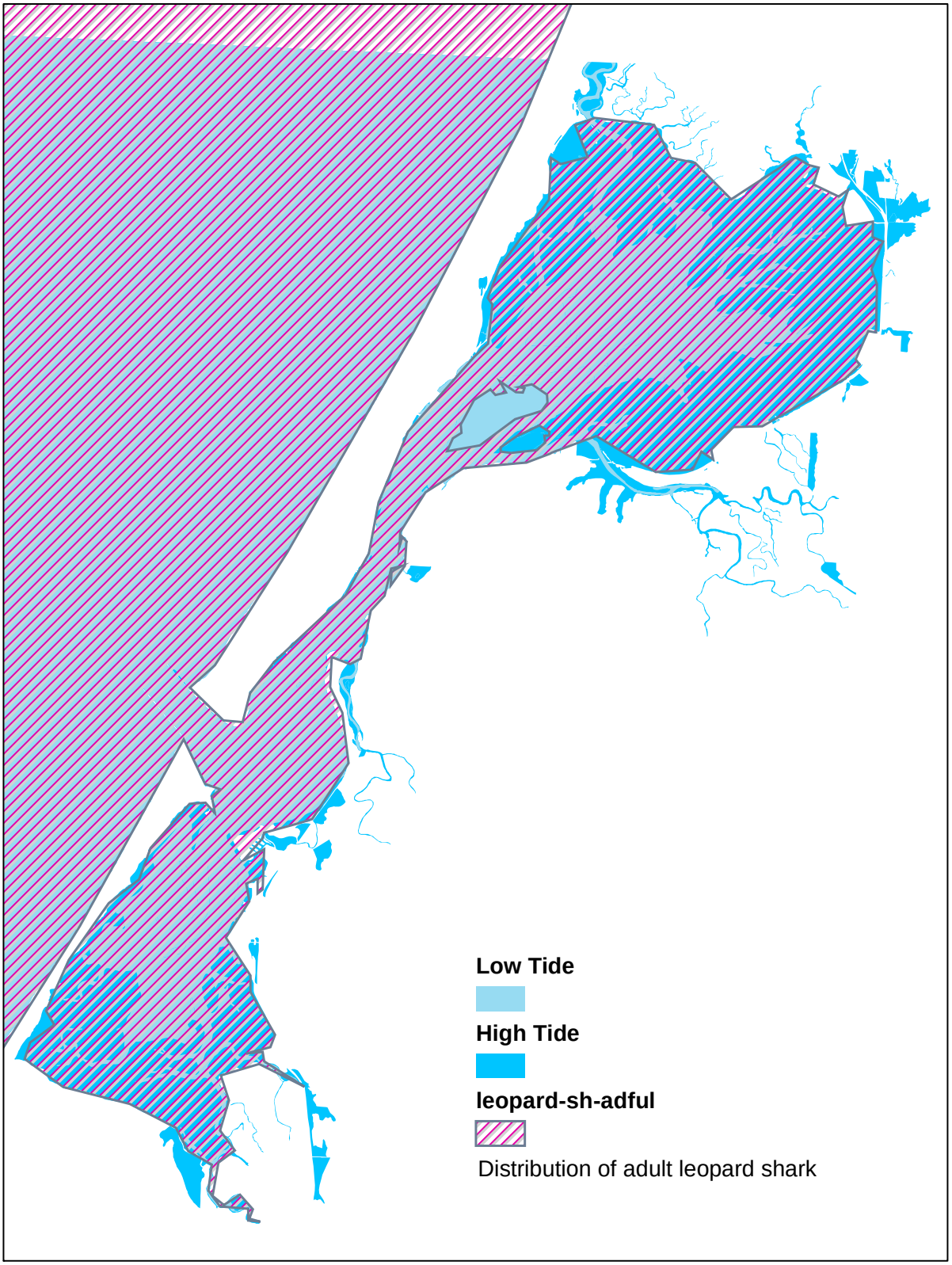

Low Tide
High Tide
grass-rf-adco
Common distribution of adult grass Rockfish

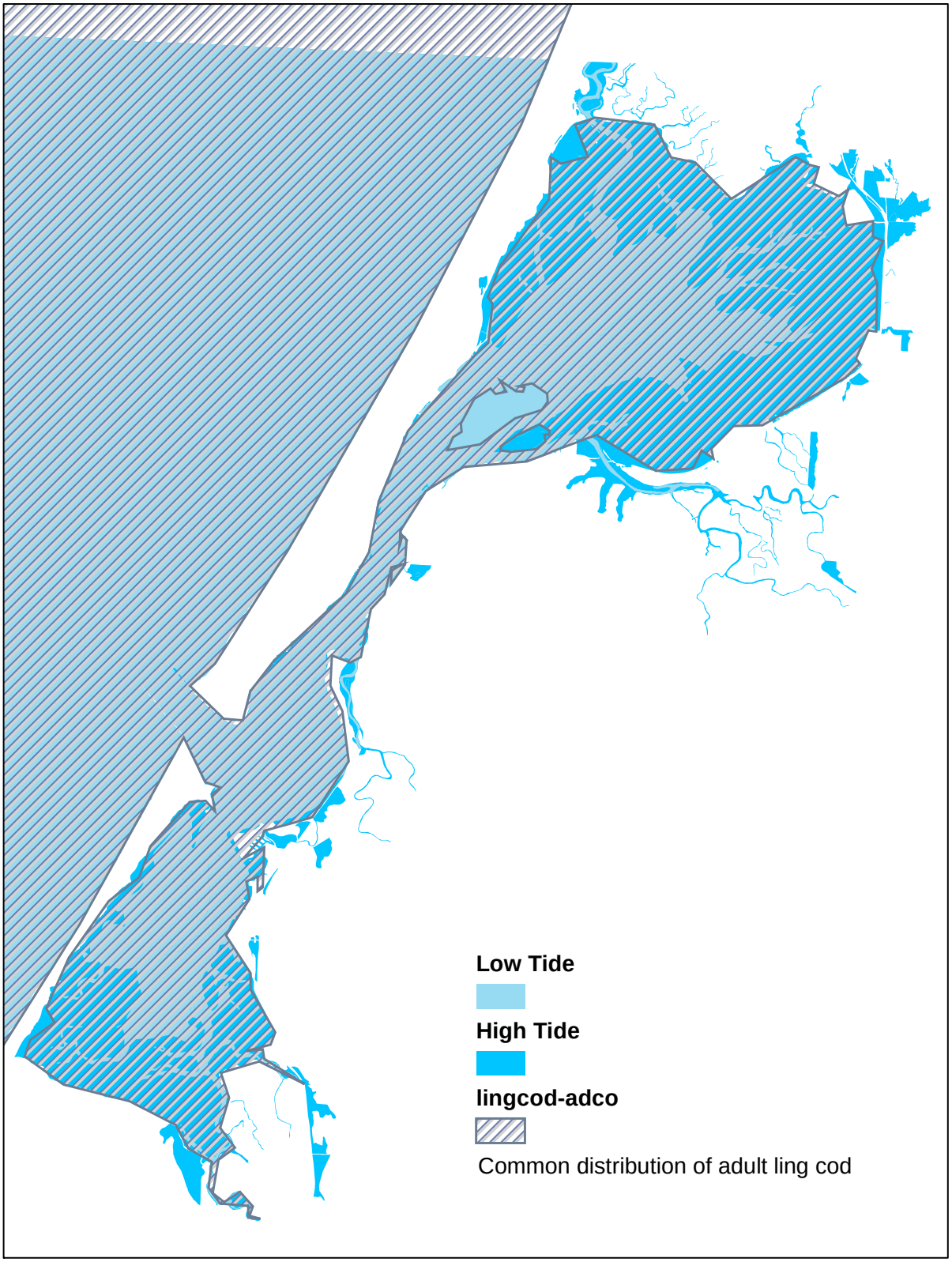

Low Tide
High Tide
grass-rf-adful
Distribution of adult grass Rockfish

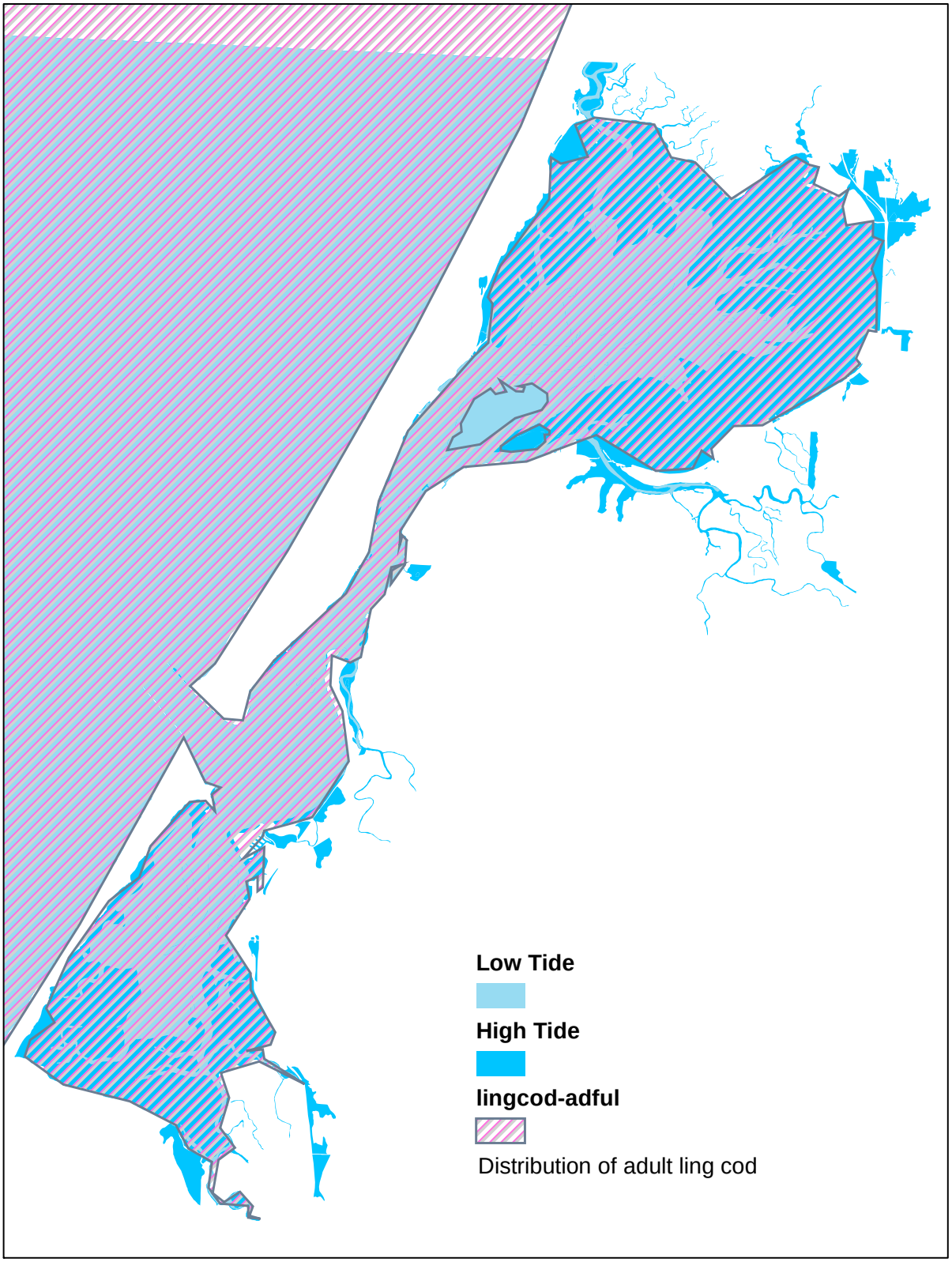

Low Tide
High Tide
kelp-gr-adco
Common distribution of adult Kelp greenling

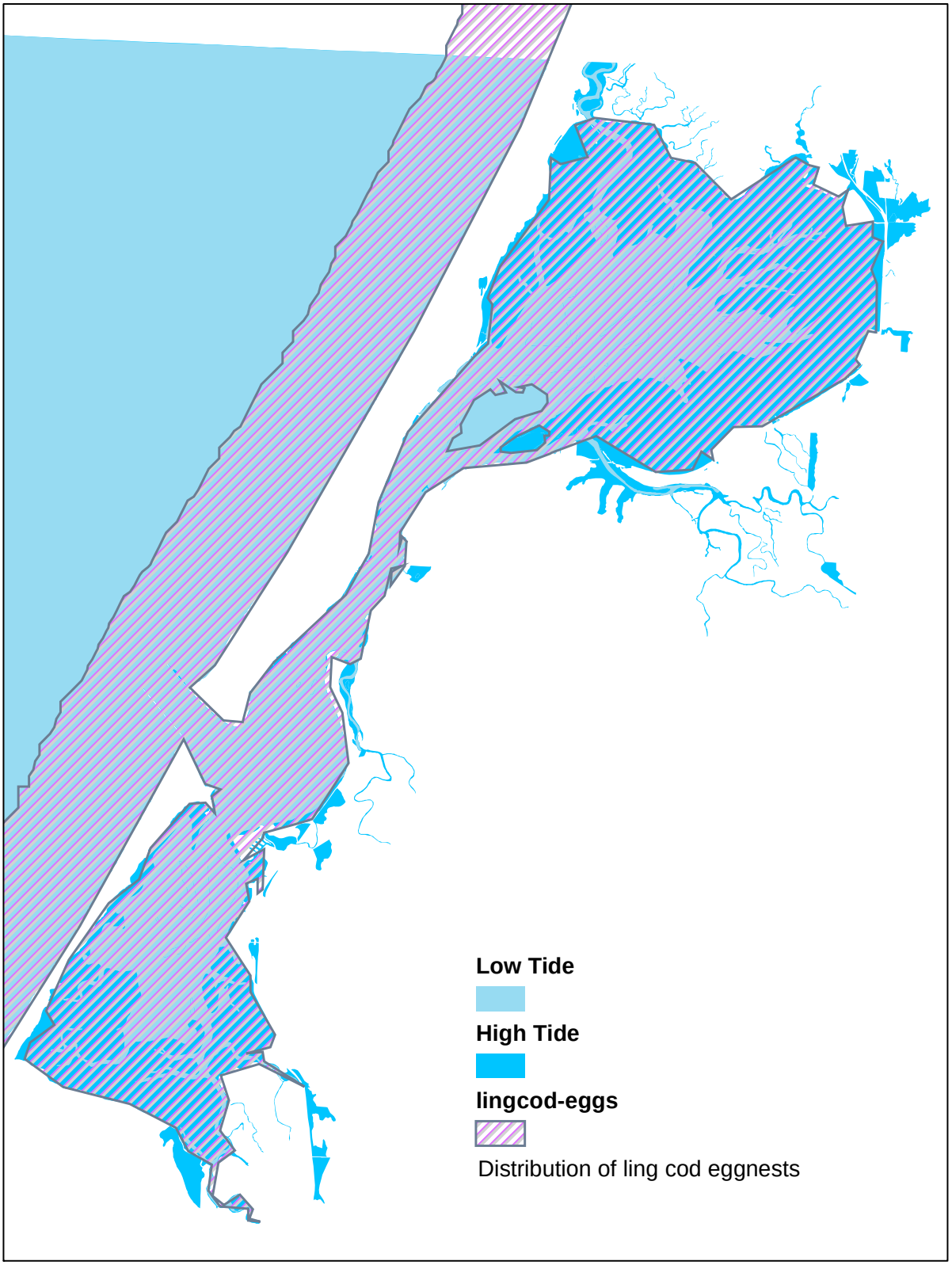

Low Tide
High Tide
kelp-gr-adful
Distribution of adult Kelp greenling

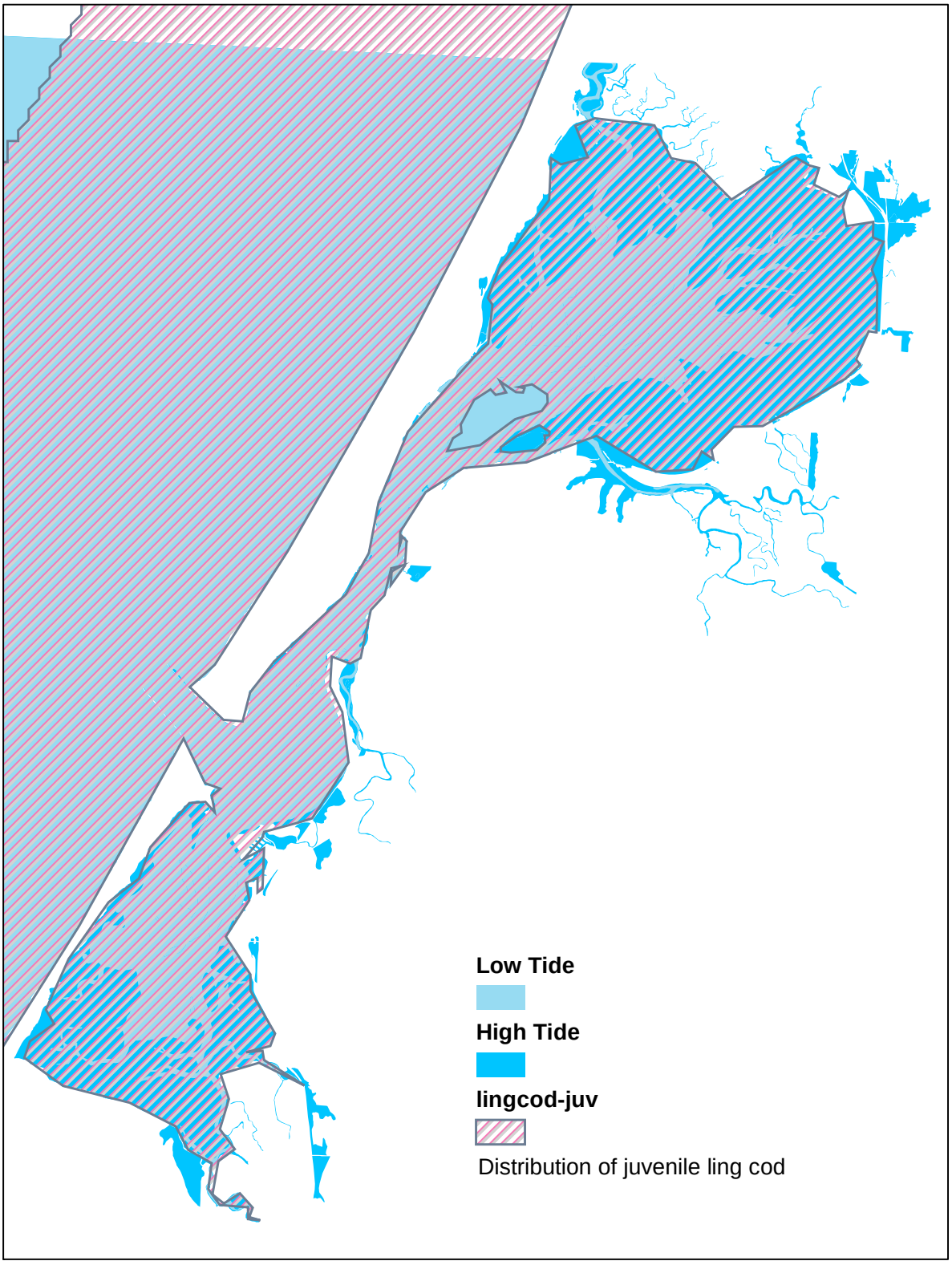

Low Tide
High Tide
leopard-sh-adco
Common distribution of adult leopard shark

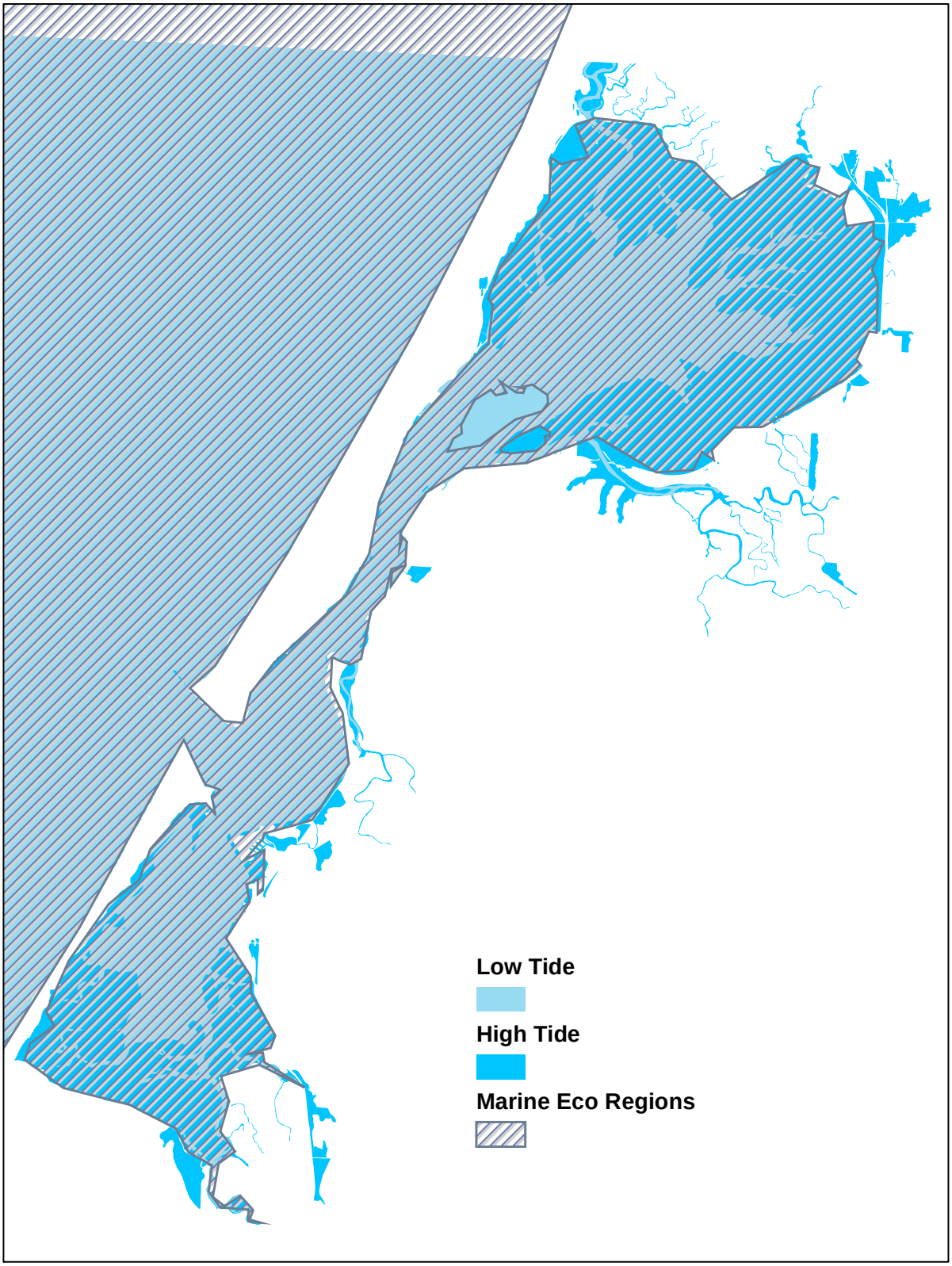

Low Tide
High Tide
leopard-sh-adful
Distribution of adult leopard shark

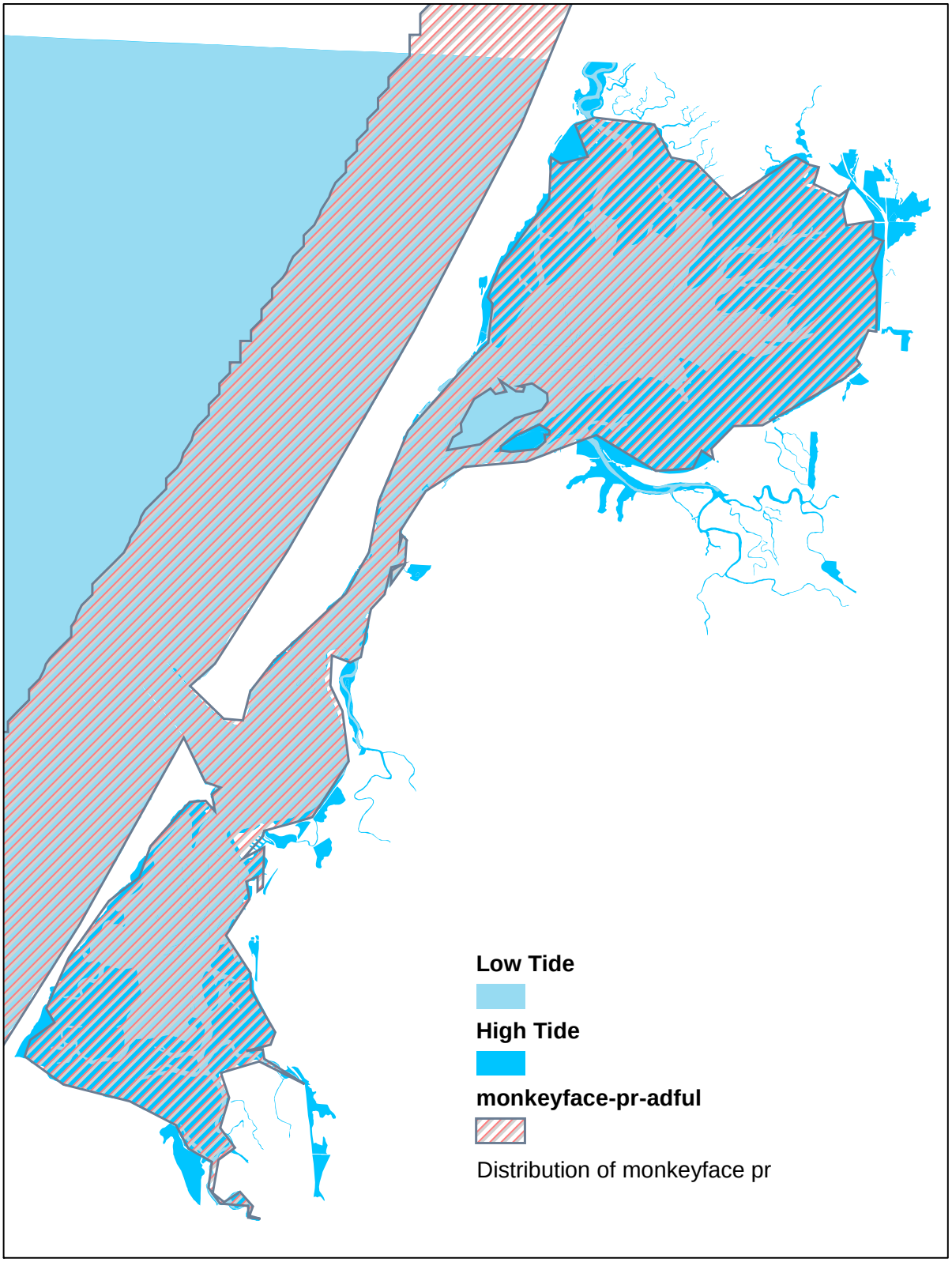

Low Tide
High Tide
lingcod-adco
Common distribution of adult ling cod

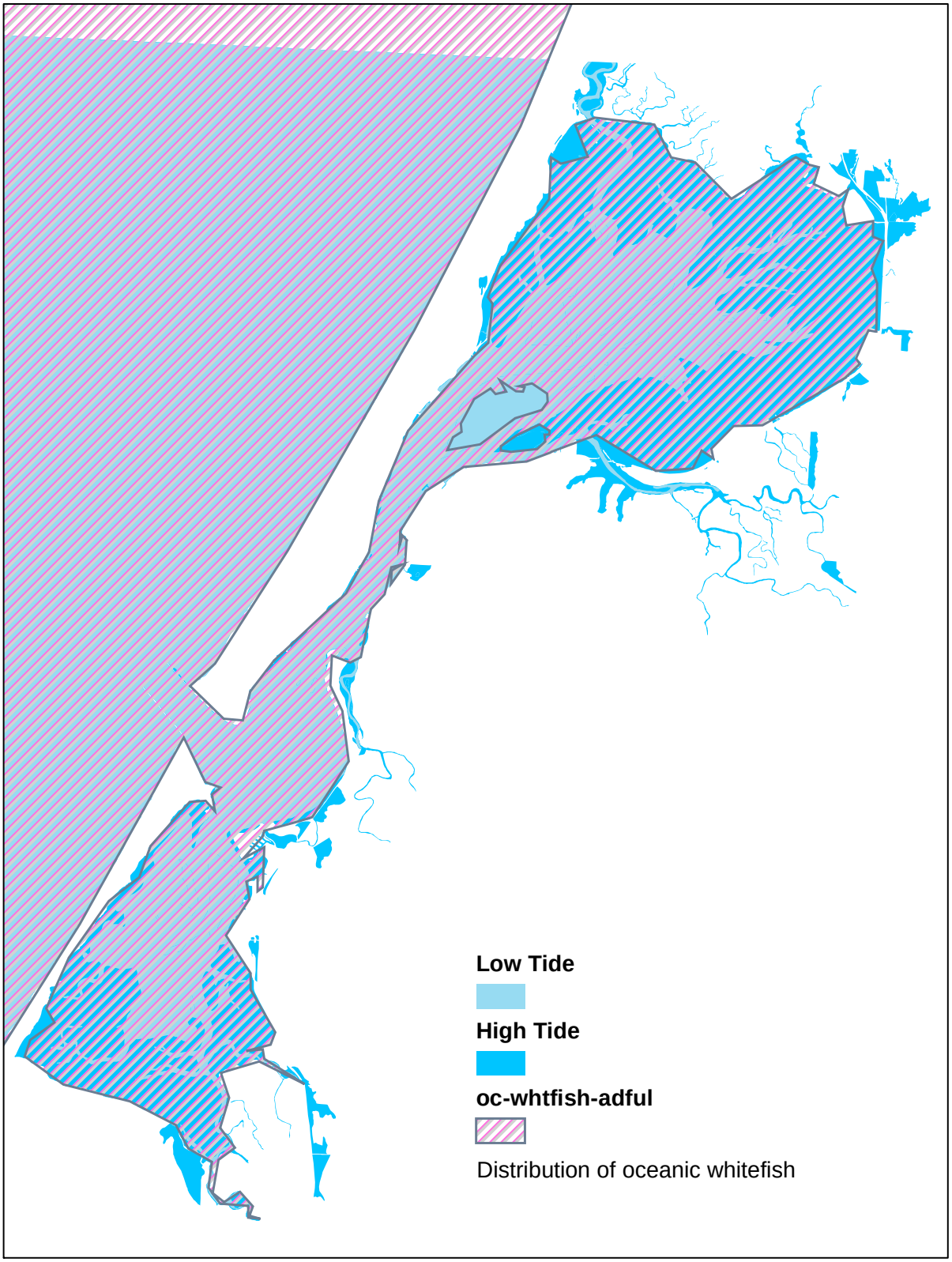

Low Tide
High Tide
lingcod-adful
Distribution of adult ling cod

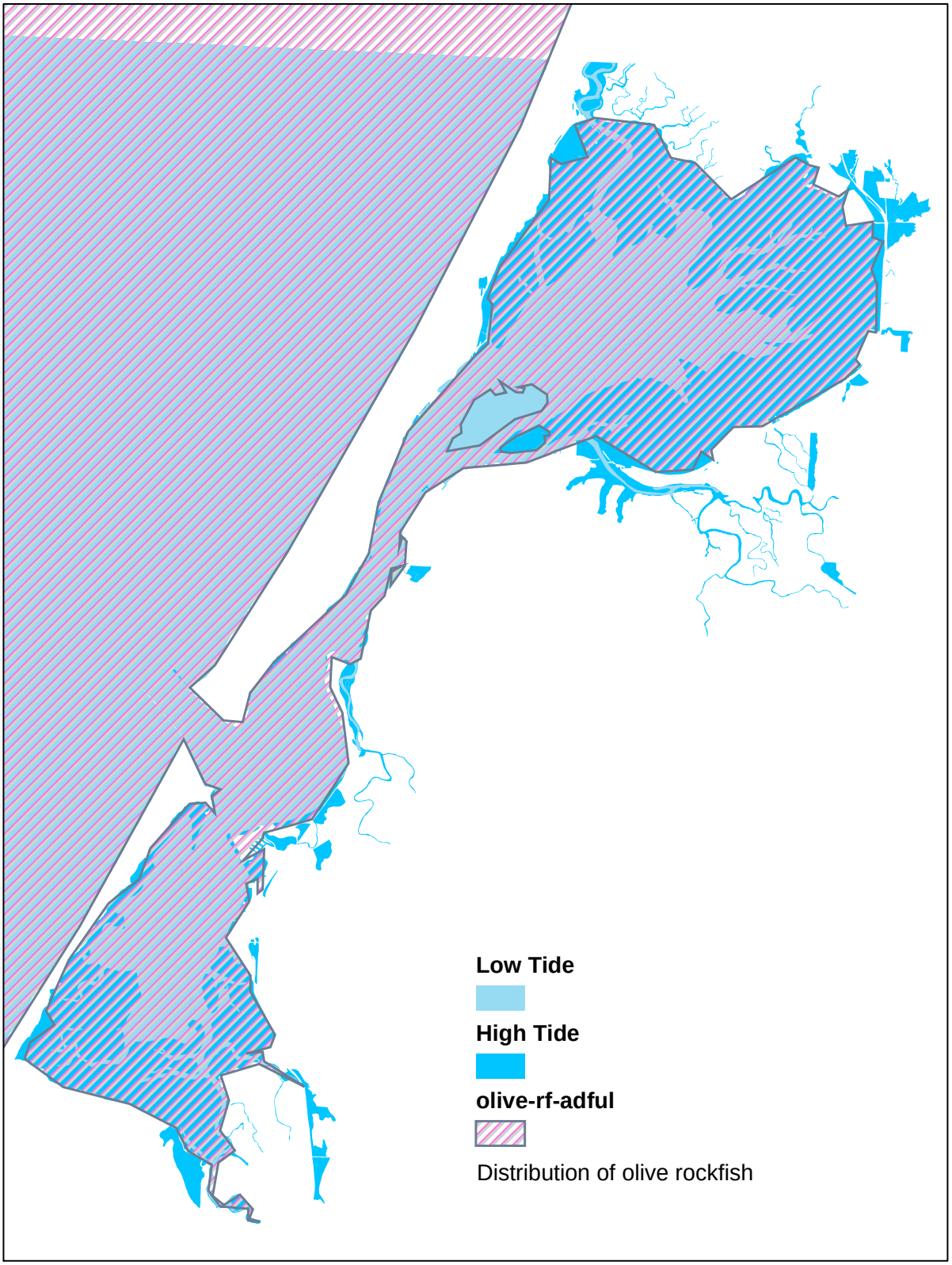

Low Tide
High Tide
lingcod-eggs
Distribution of ling cod eggnests

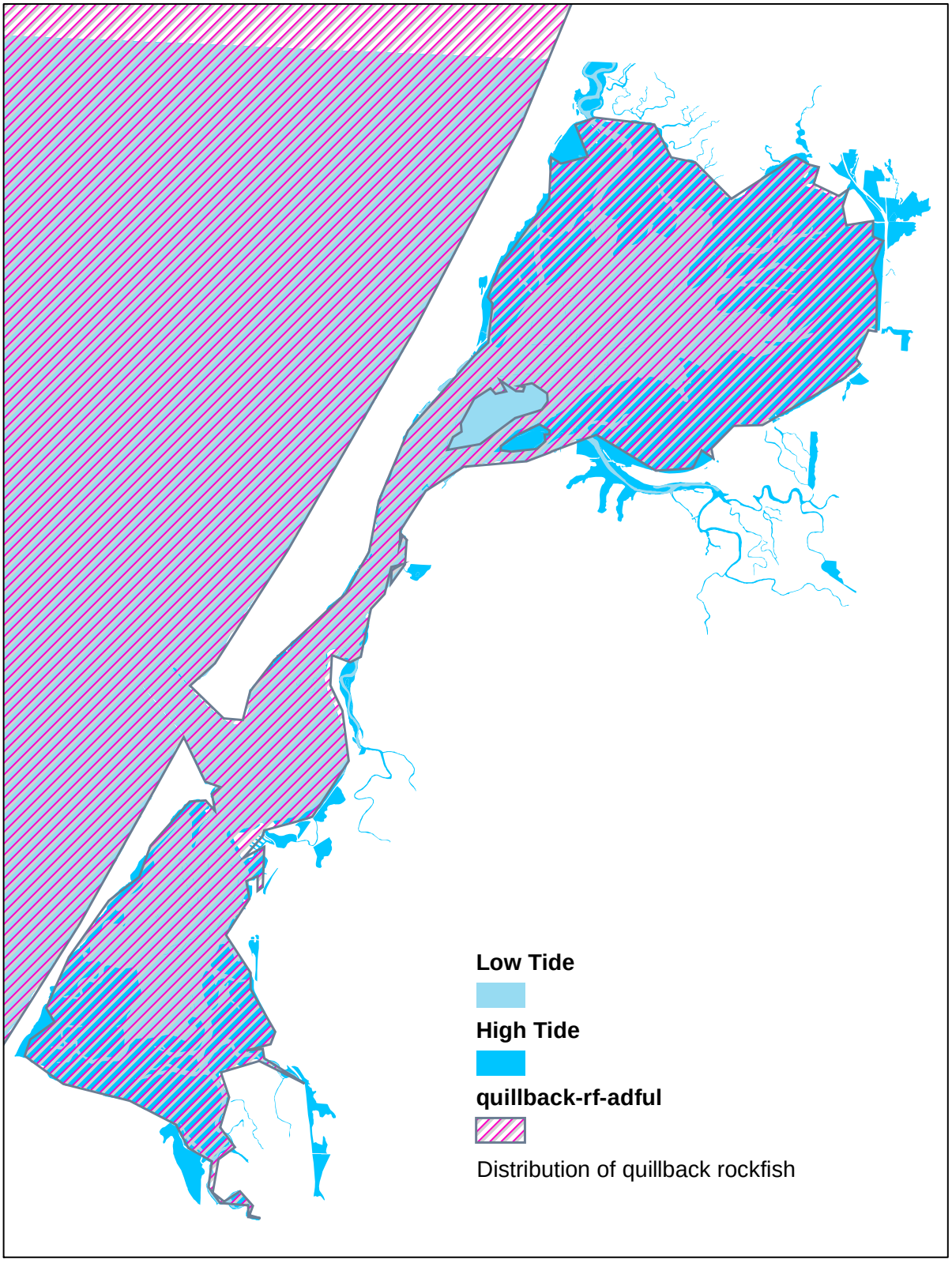

Low Tide
High Tide
lingcod-juv
Distribution of juvenile ling cod

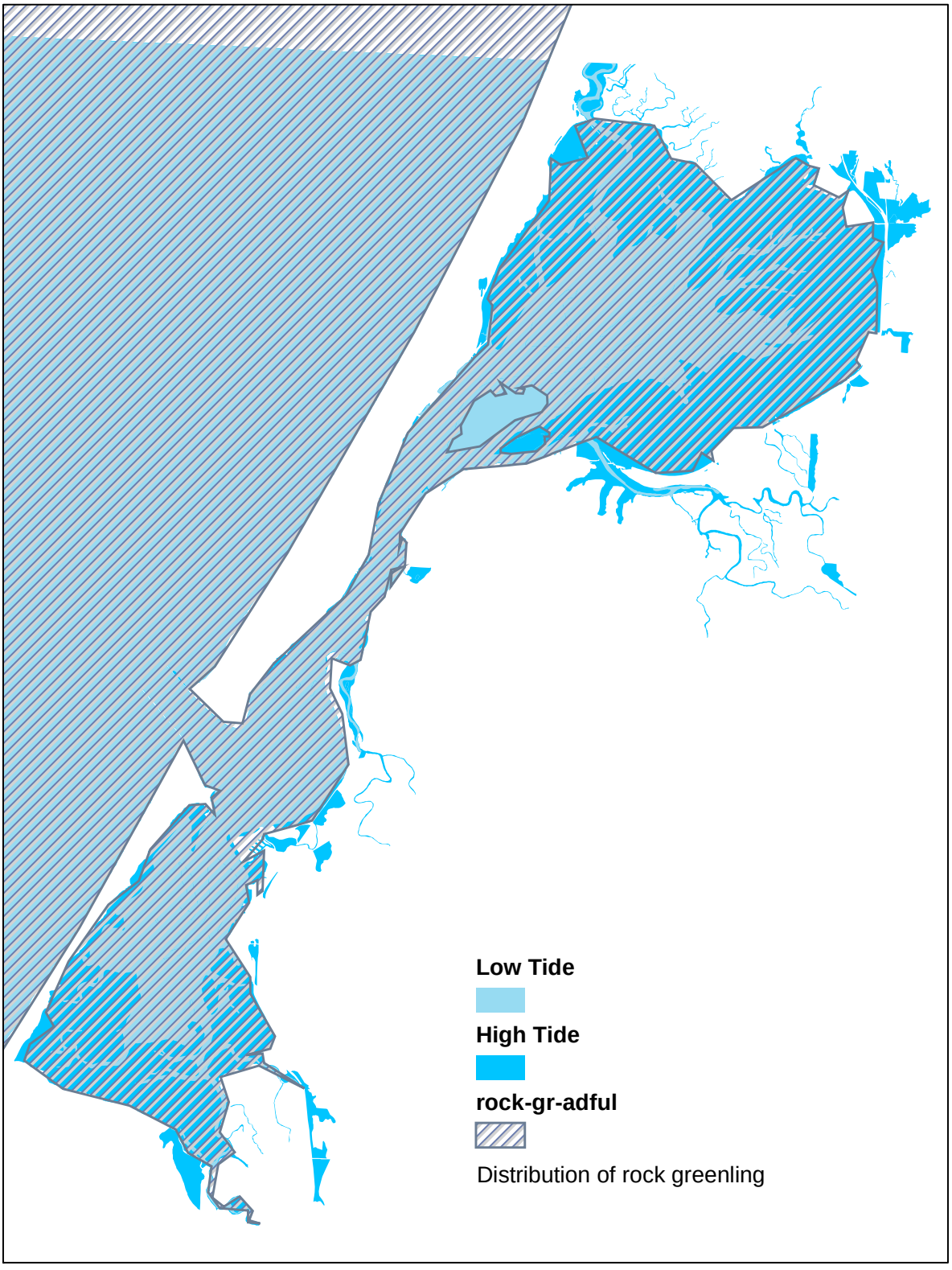

Low Tide
High Tide
Marine Eco Regions

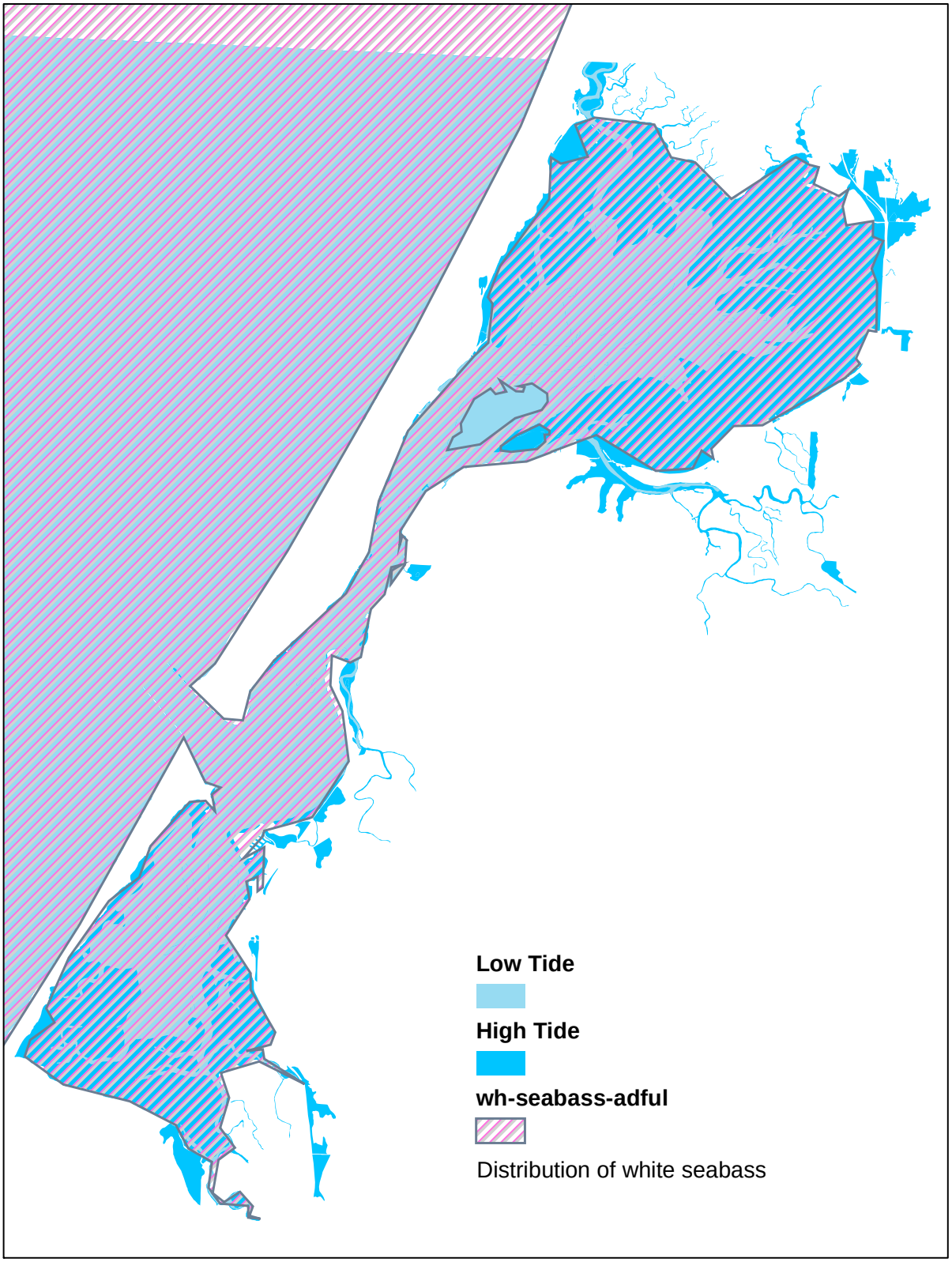

Low Tide
High Tide
monkeyface-pr-adful
Distribution of monkeyface pr

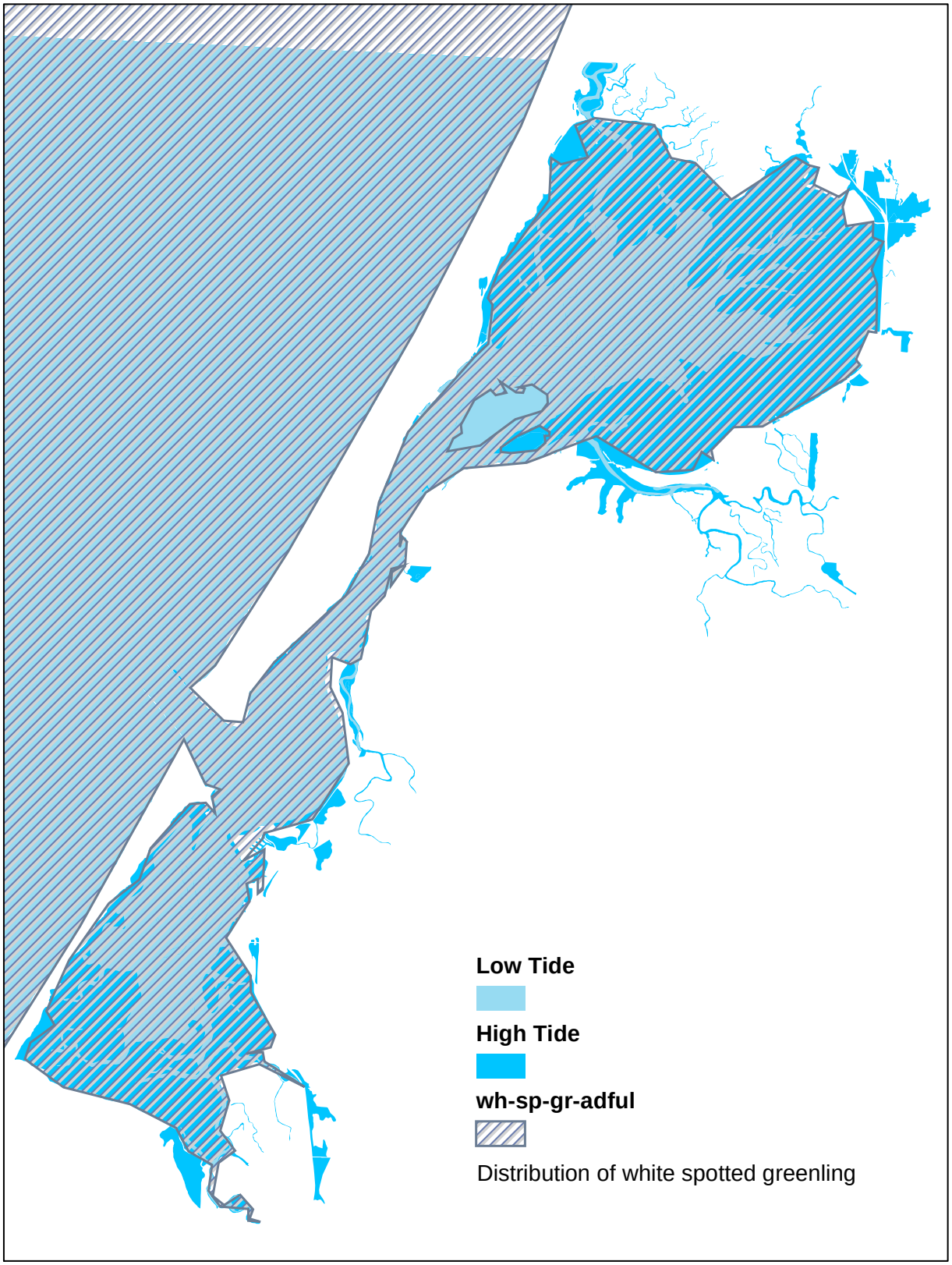

Low Tide
High Tide
oc-whtfish-adful
Distribution of oceanic whitefish

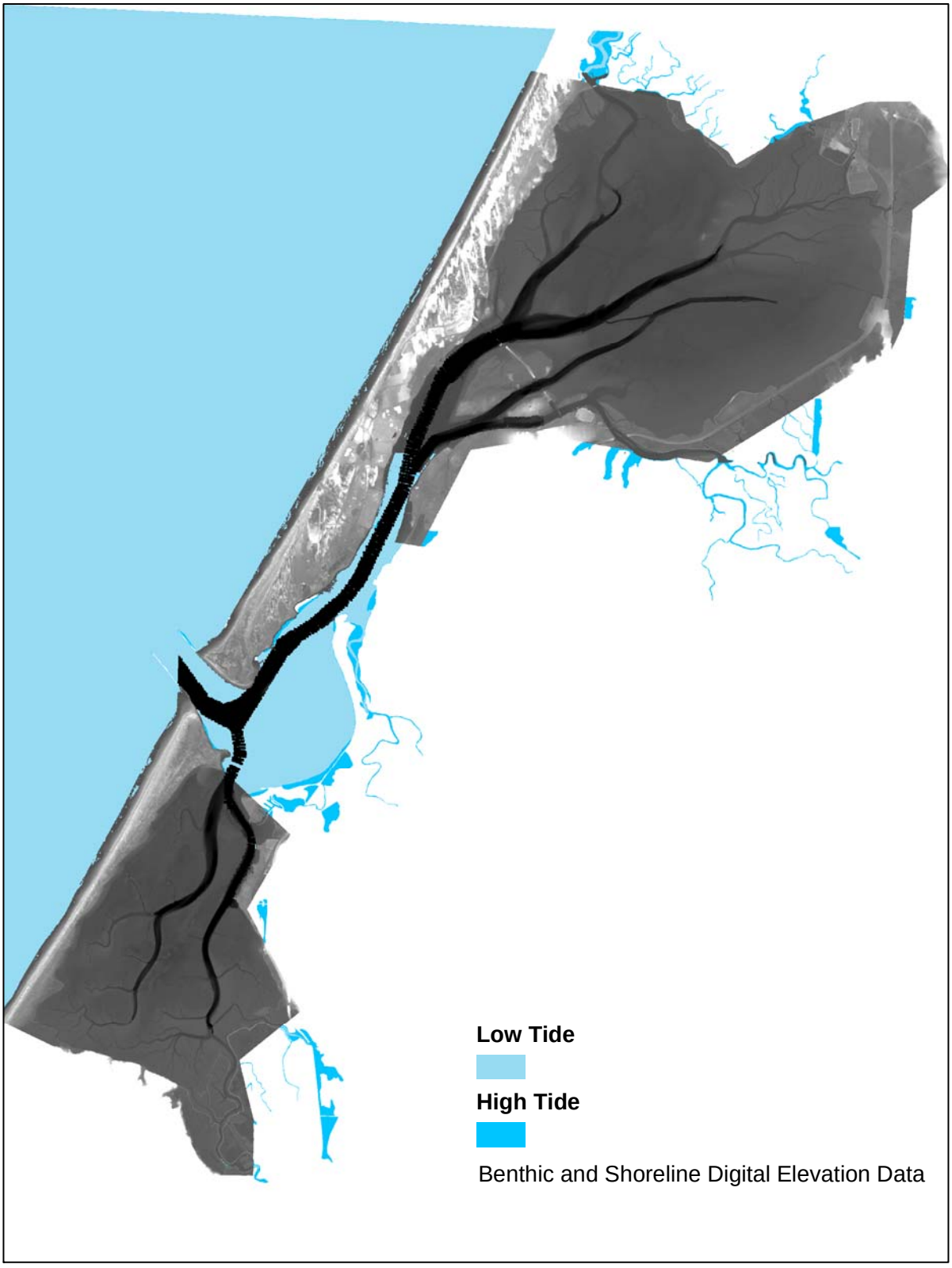

Low Tide
High Tide
olive-rf-adful
Distribution of olive rockfish

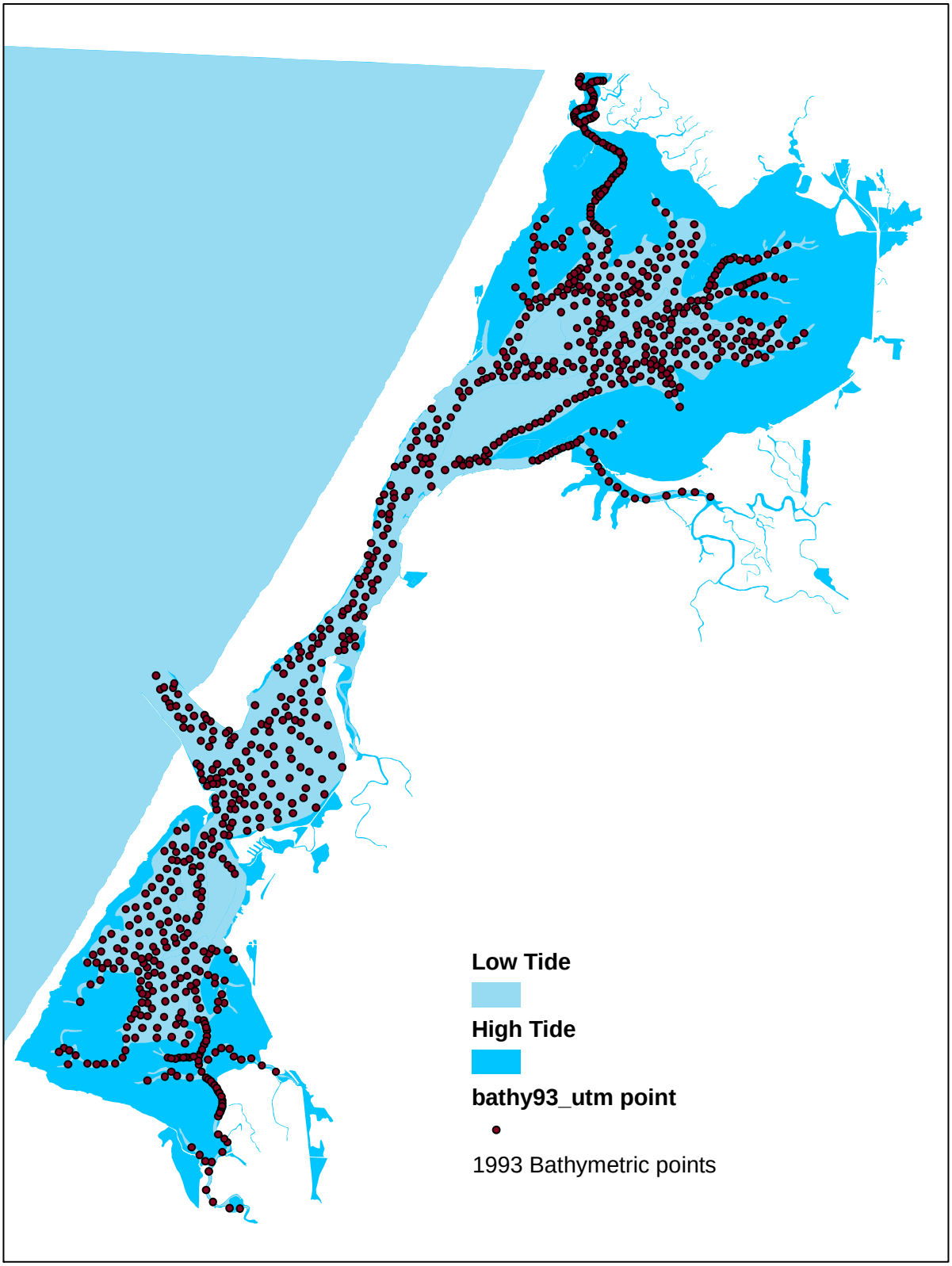

Low Tide
High Tide
quillback-rf-adful
Distribution of quillback rockfish

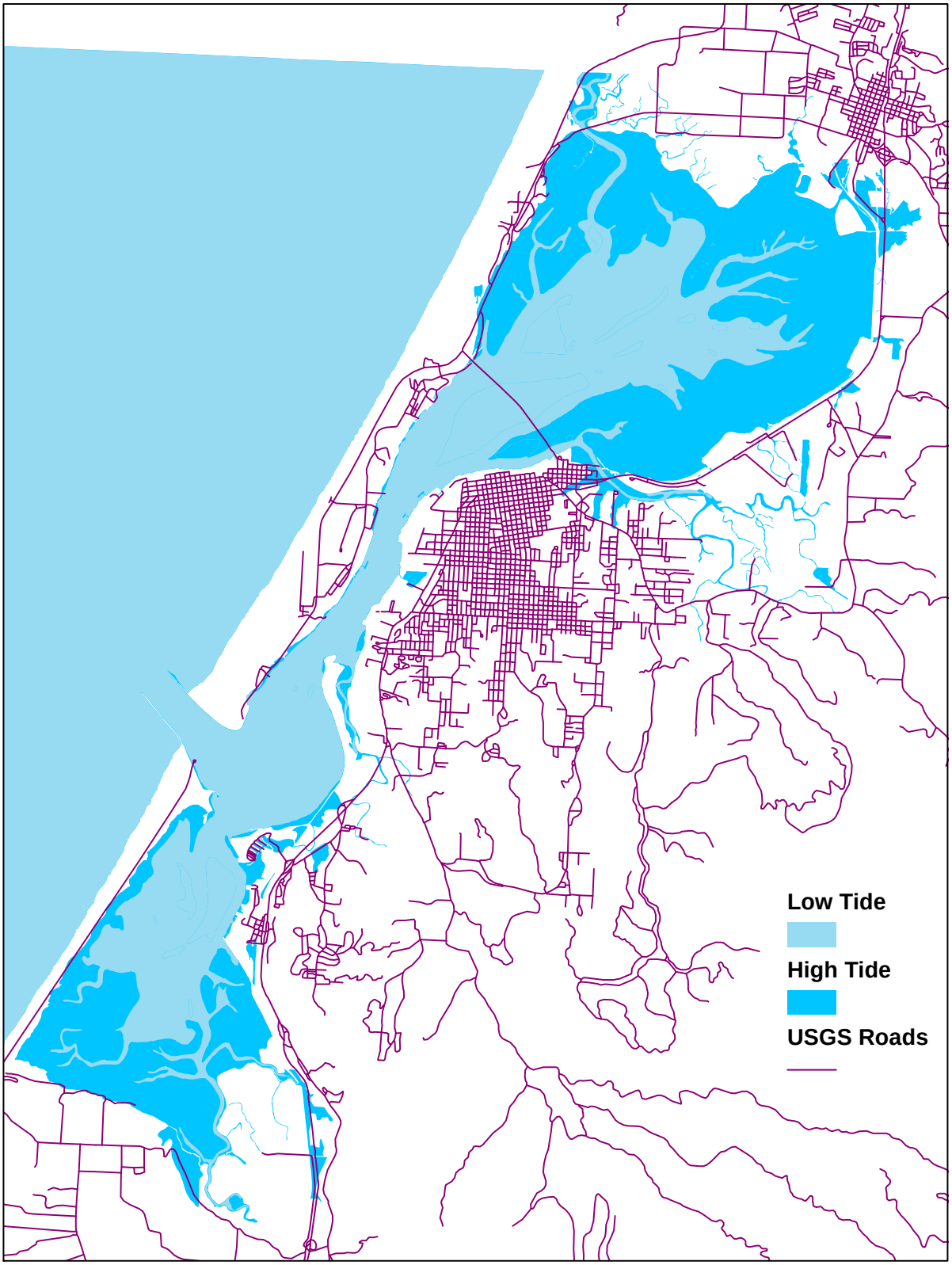

Low Tide
High Tide
rock-gr-adful
Distribution of rock greenling

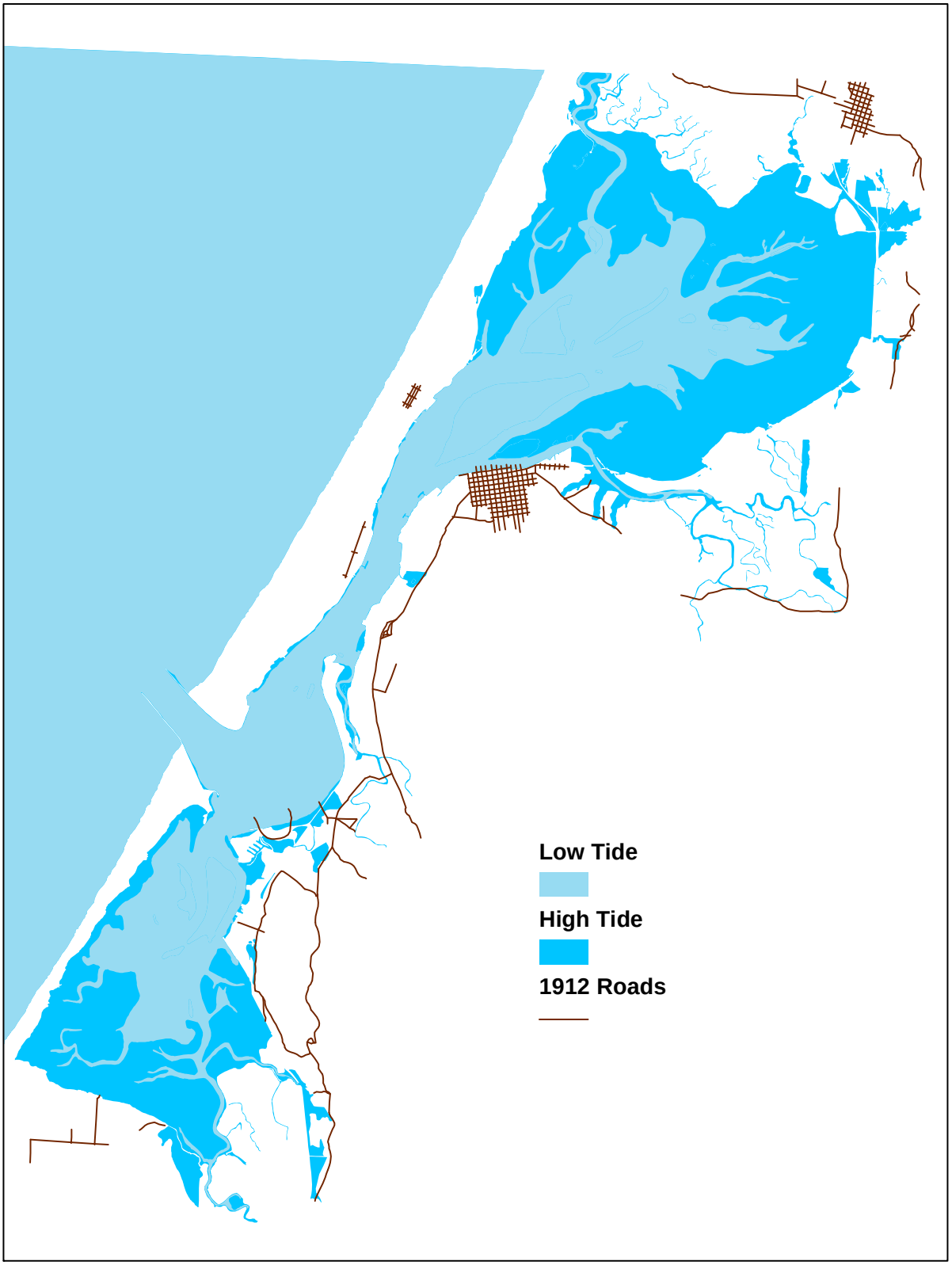

Low Tide
High Tide
wh-seabass-adful
Distribution of white seabass

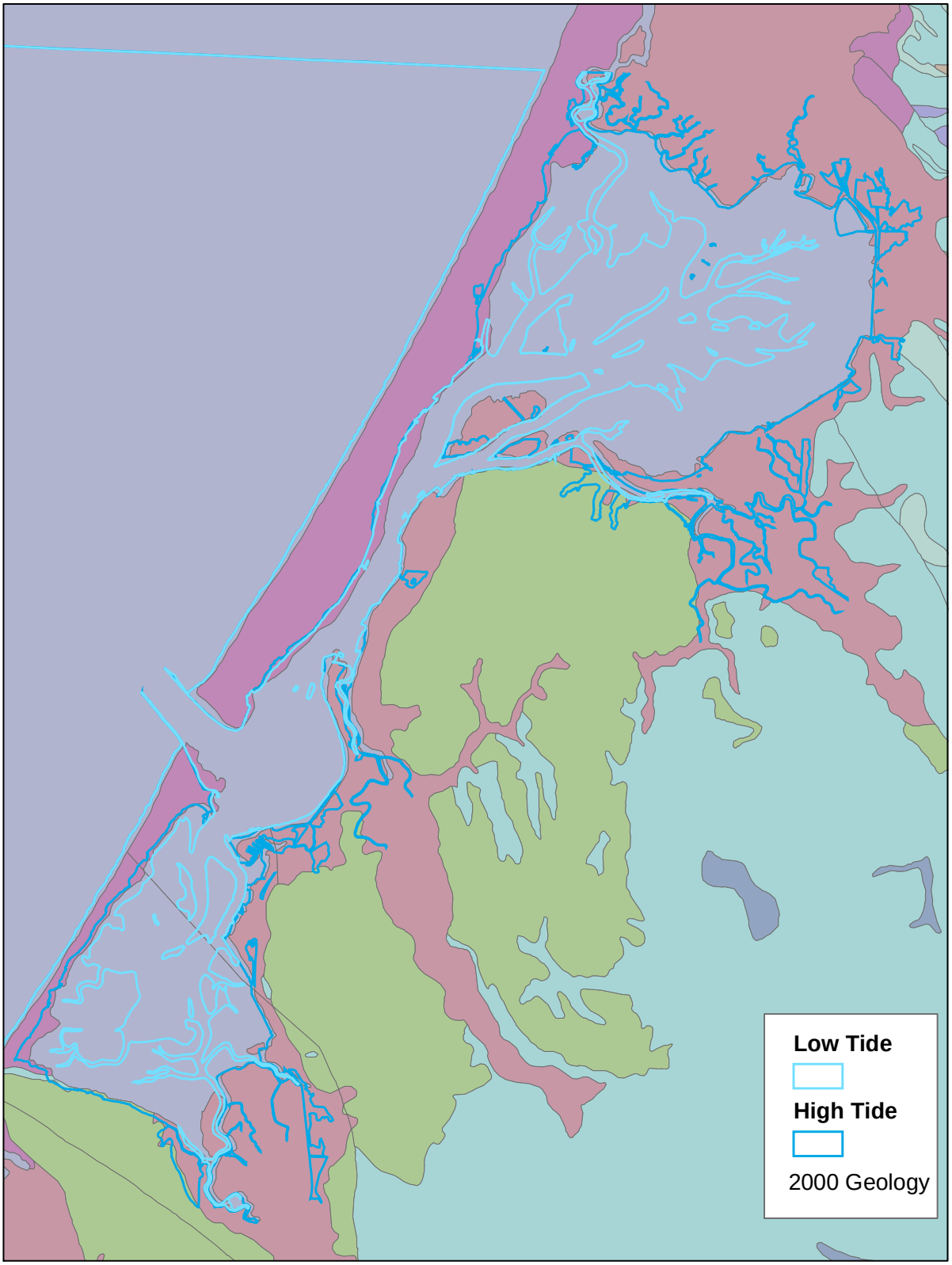

Low Tide
High Tide
wh-sp-gr-adful
Distribution of white spotted greenling

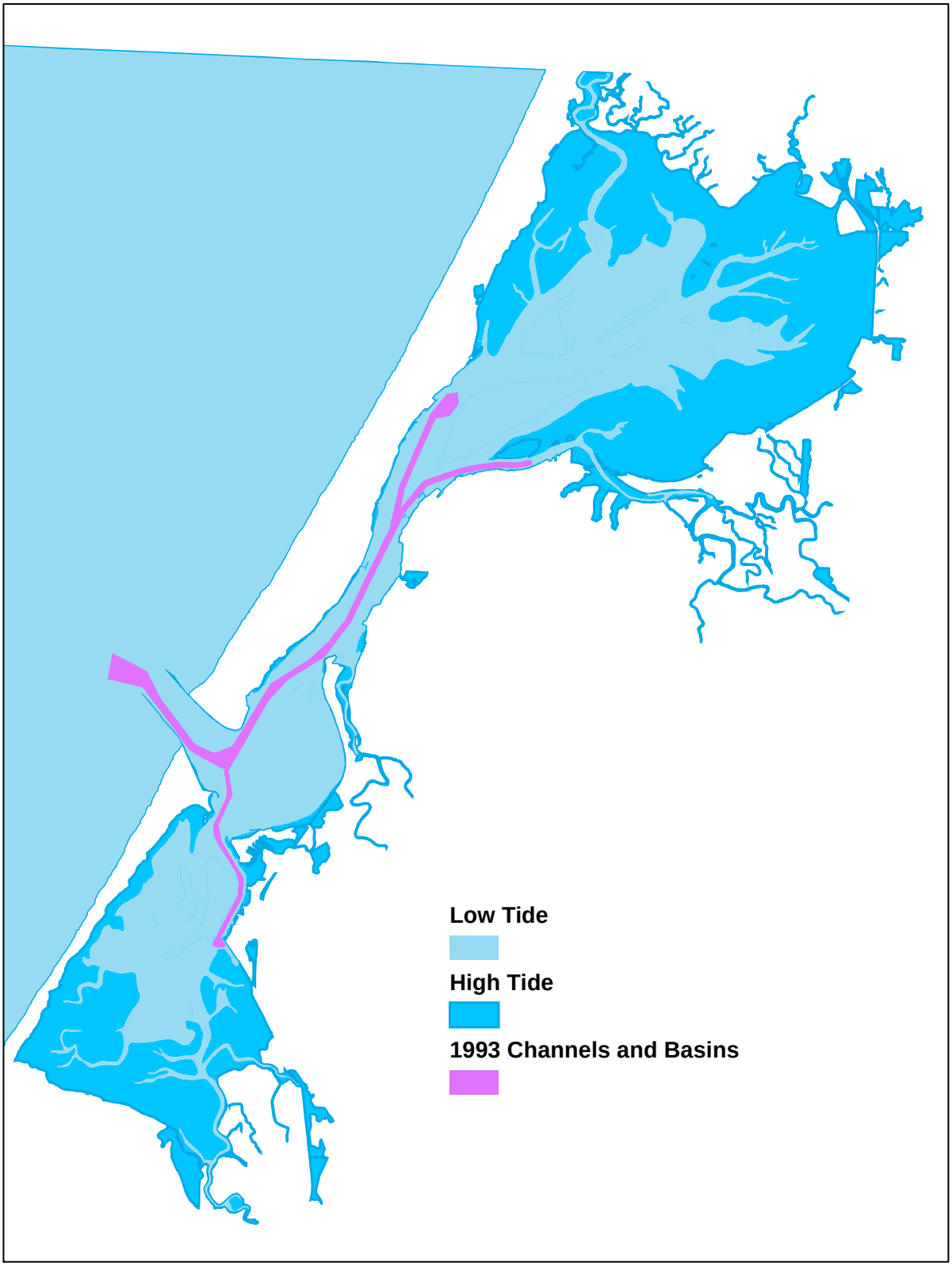

Low Tide
High Tide
Benthic and Shoreline Digital Elevation Data

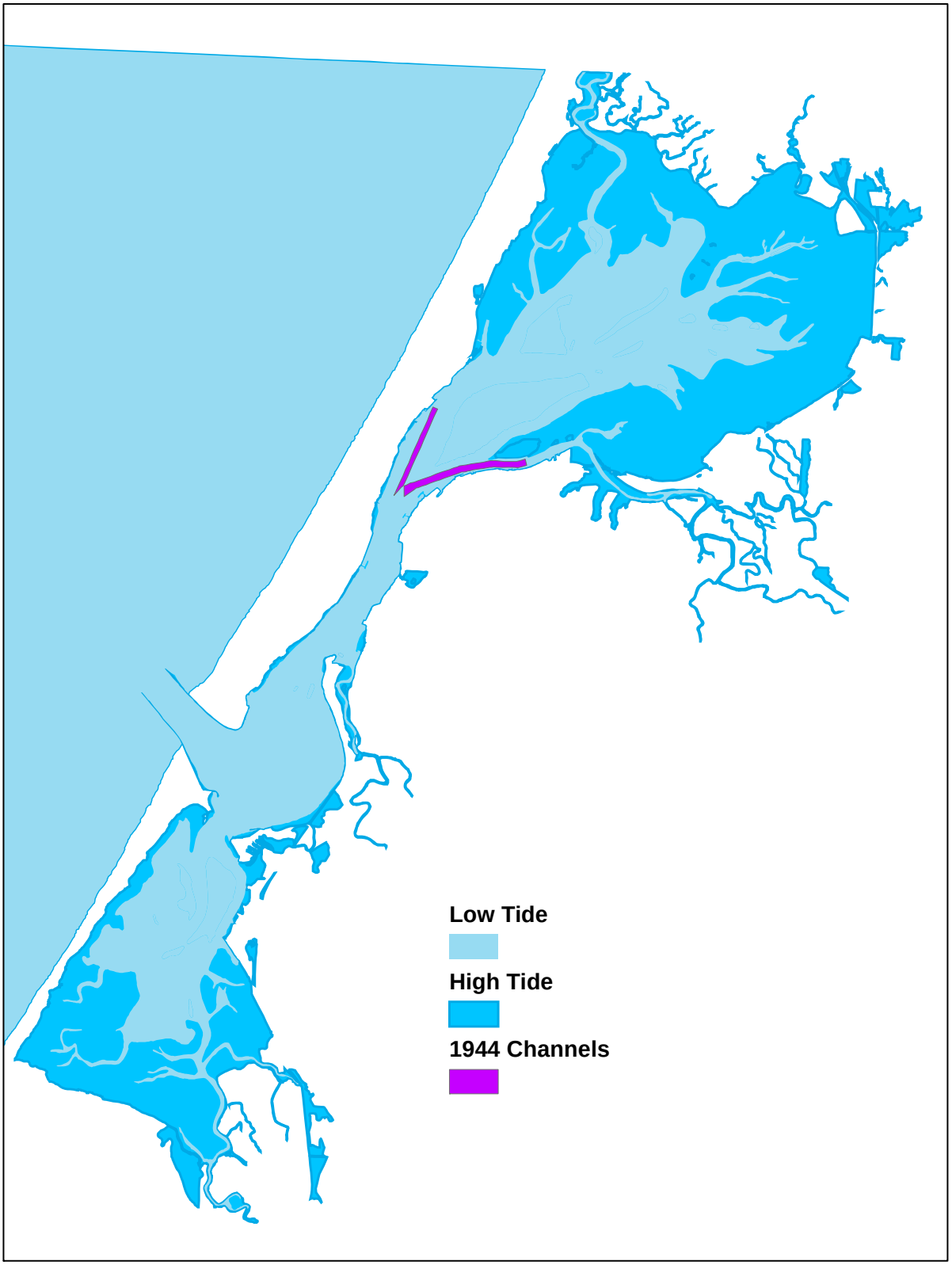

Low Tide
High Tide
bathy93_utm point
1993 Bathymetric points

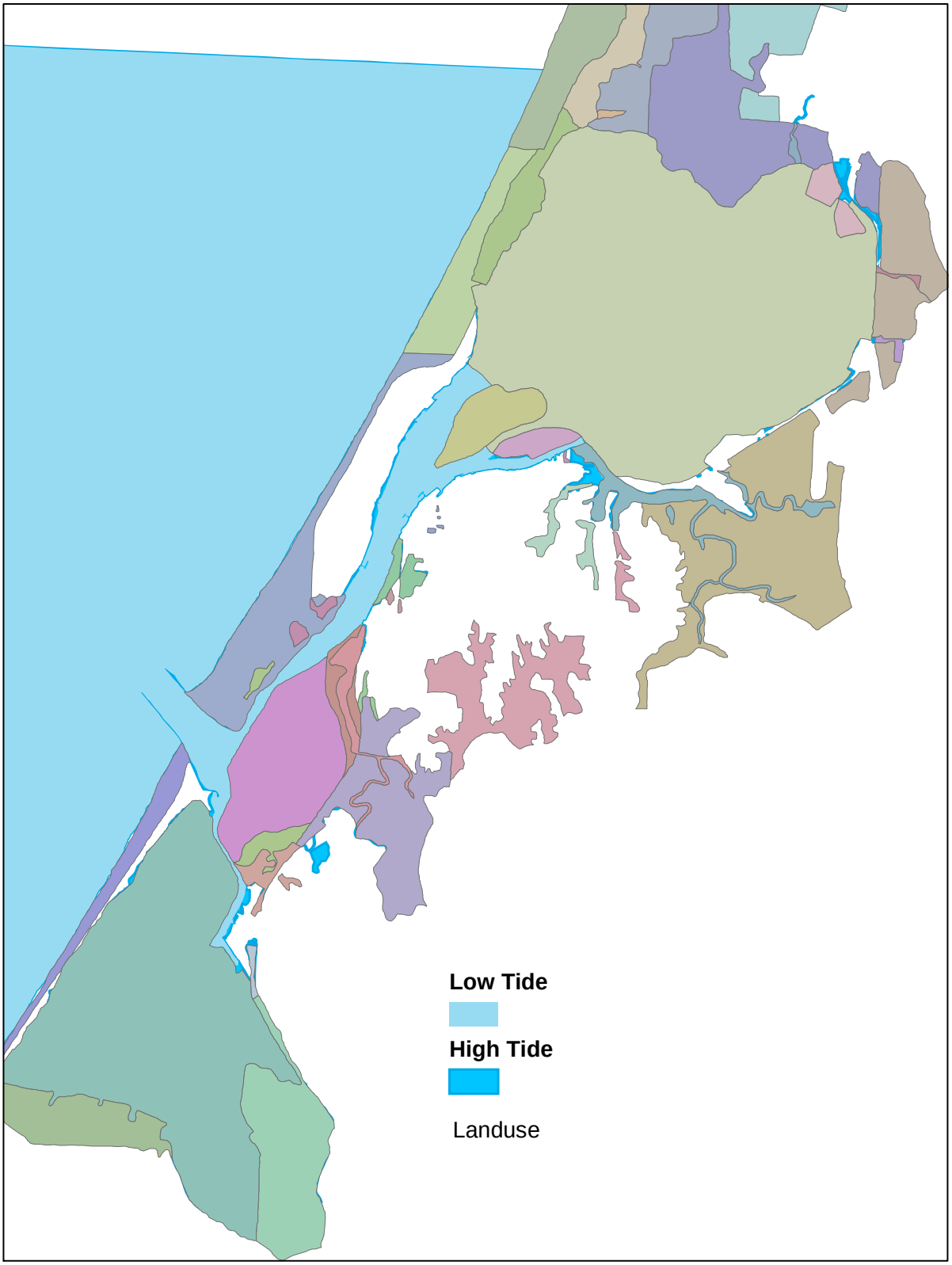

Low Tide
High Tide
USGS Roads

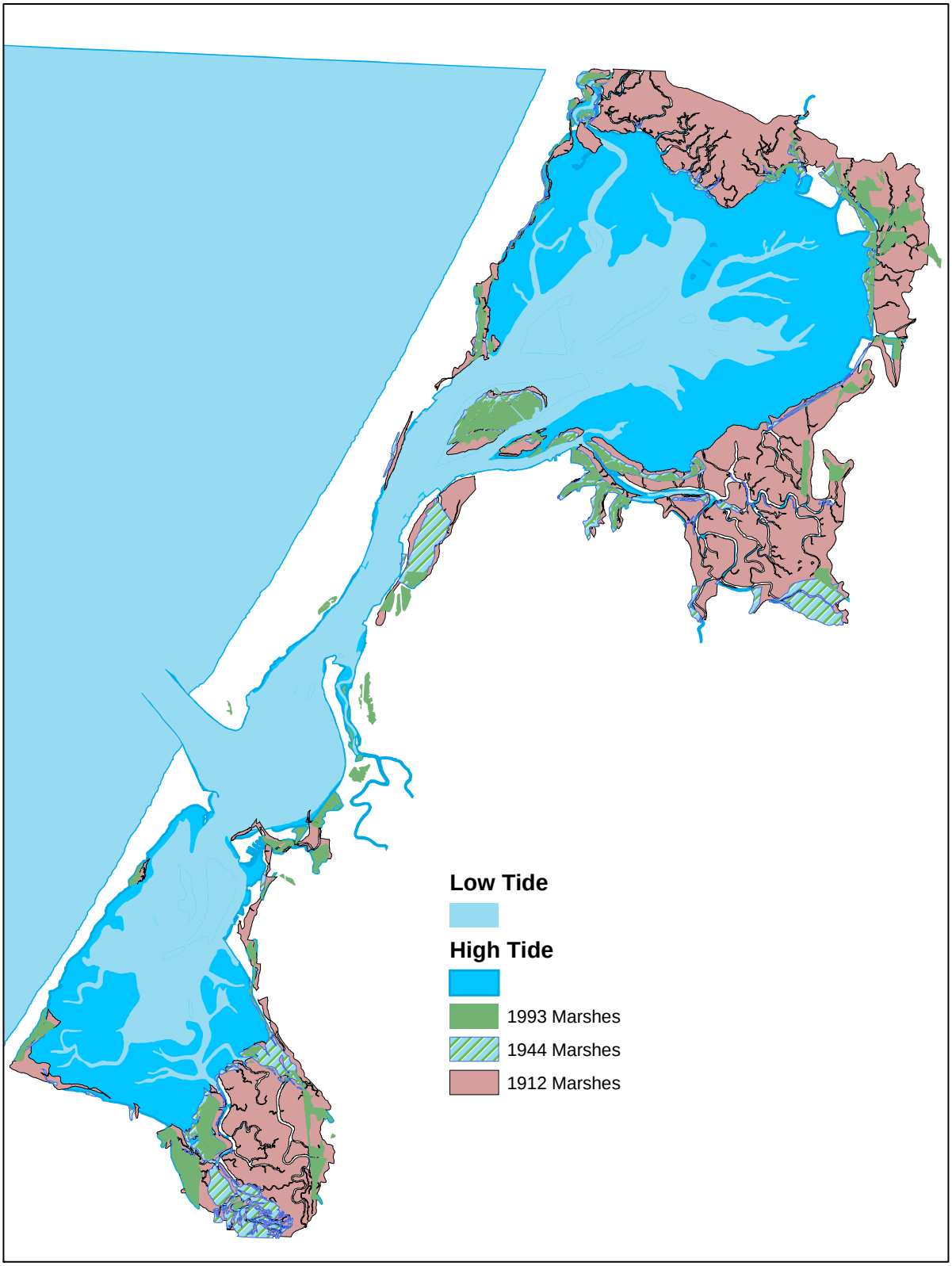

Low Tide
High Tide
1912 Roads

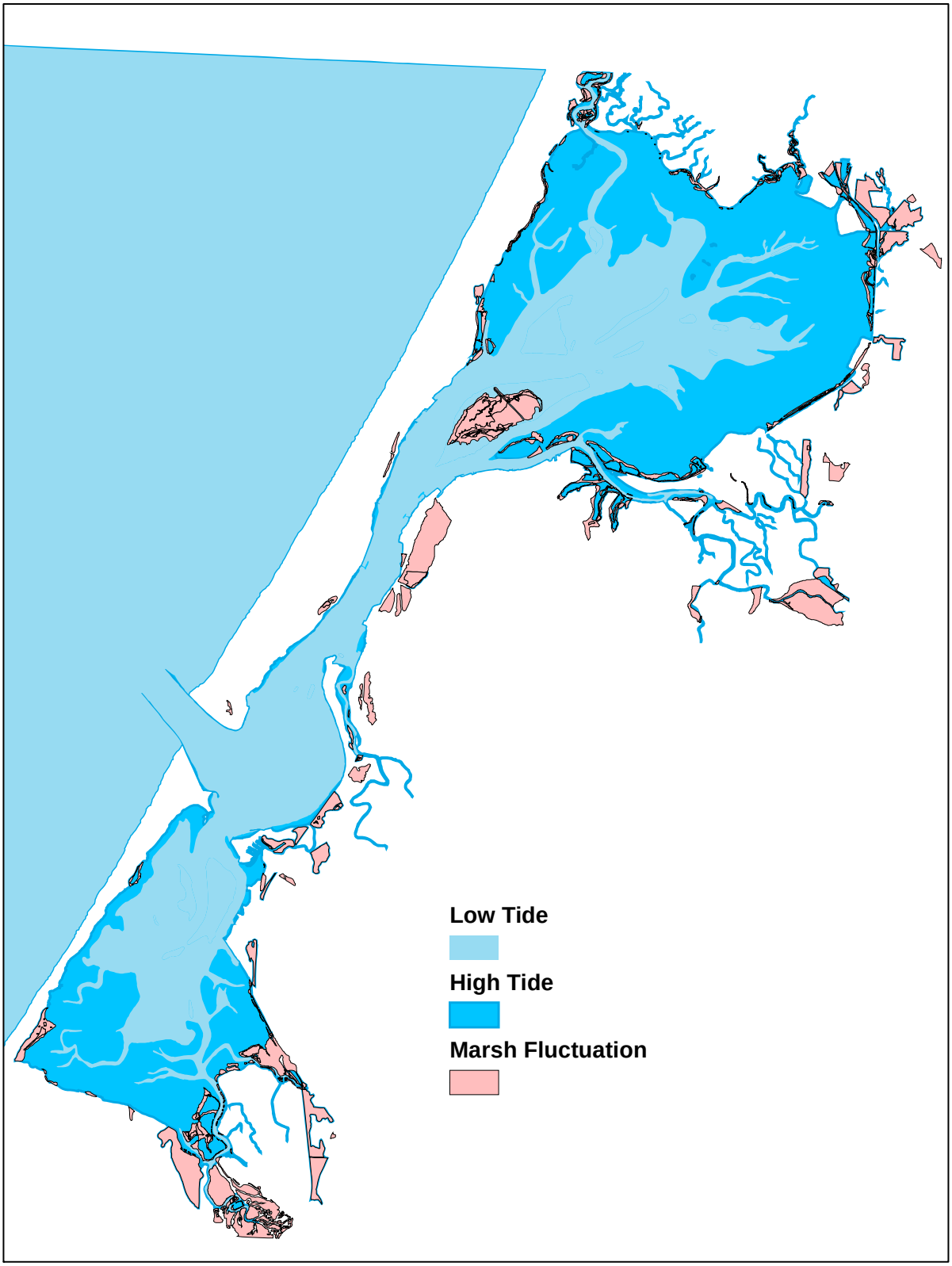

Low Tide
High Tide
2000 Geology

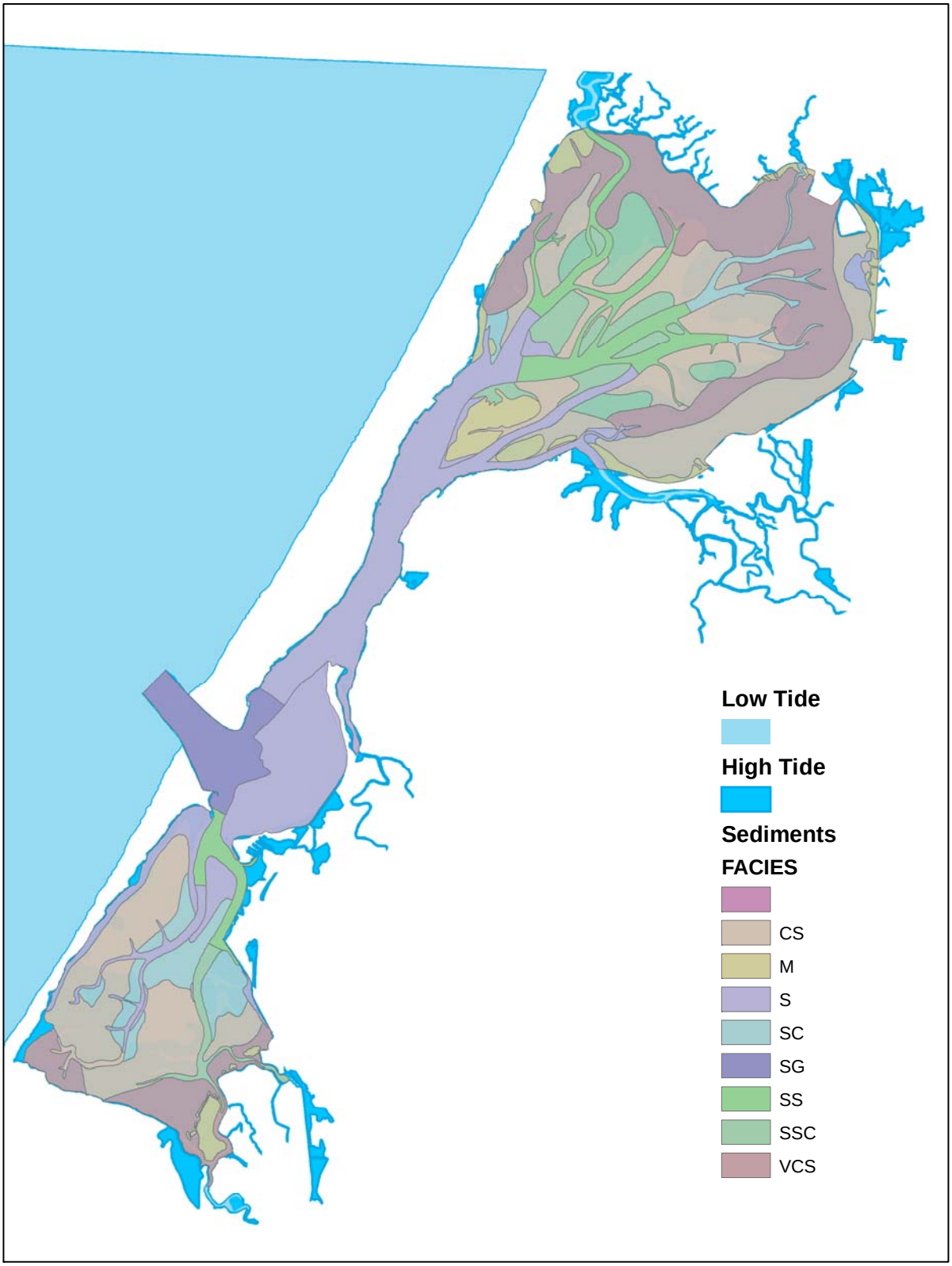

Low Tide
High Tide
1993 Channels and Basins

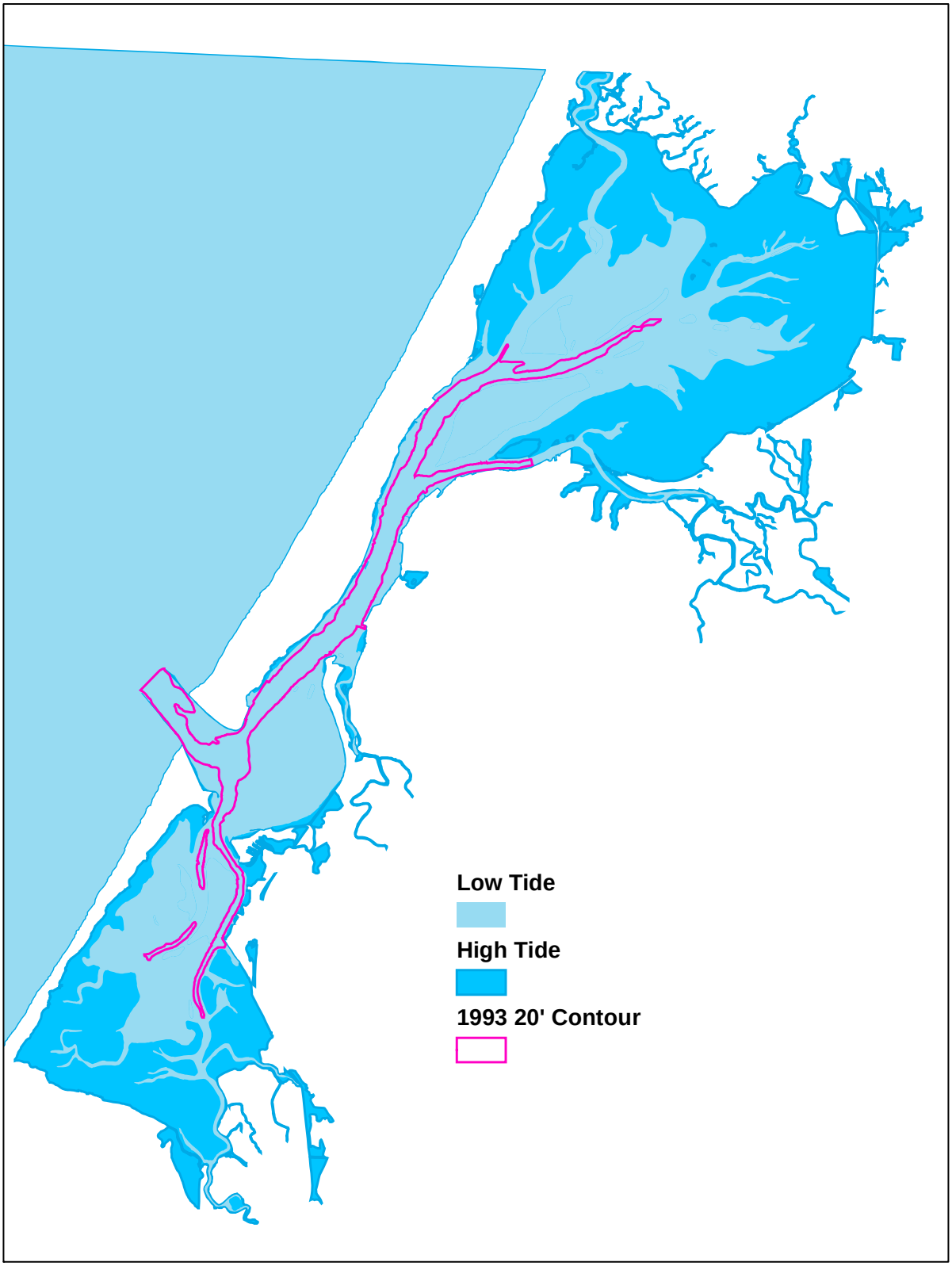

Low Tide
High Tide
1944 Channels

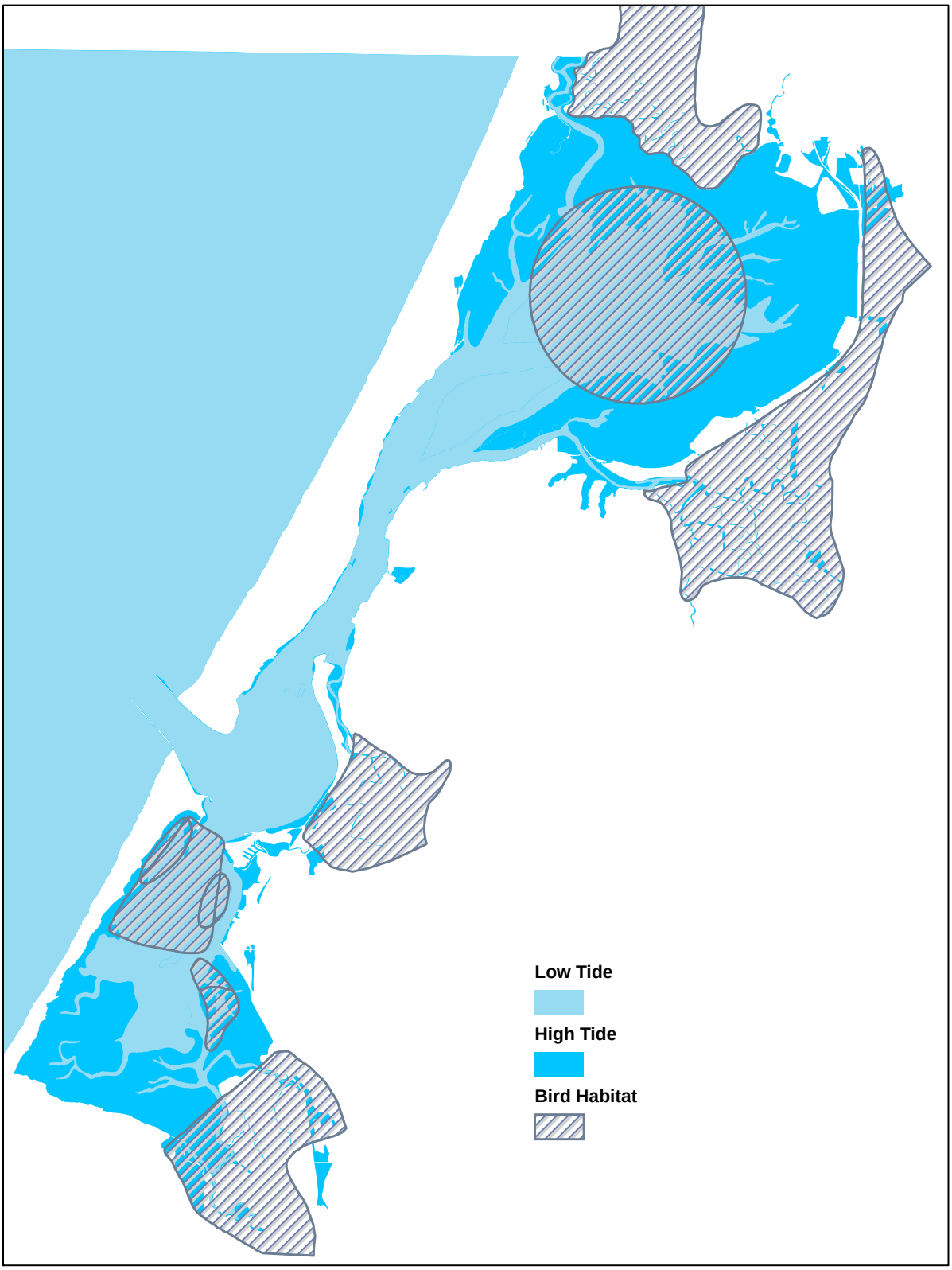

Low Tide
High Tide
Landuse


Low Tide
High Tide
1993 Marshes
1944 Marshes
1912 Marshes

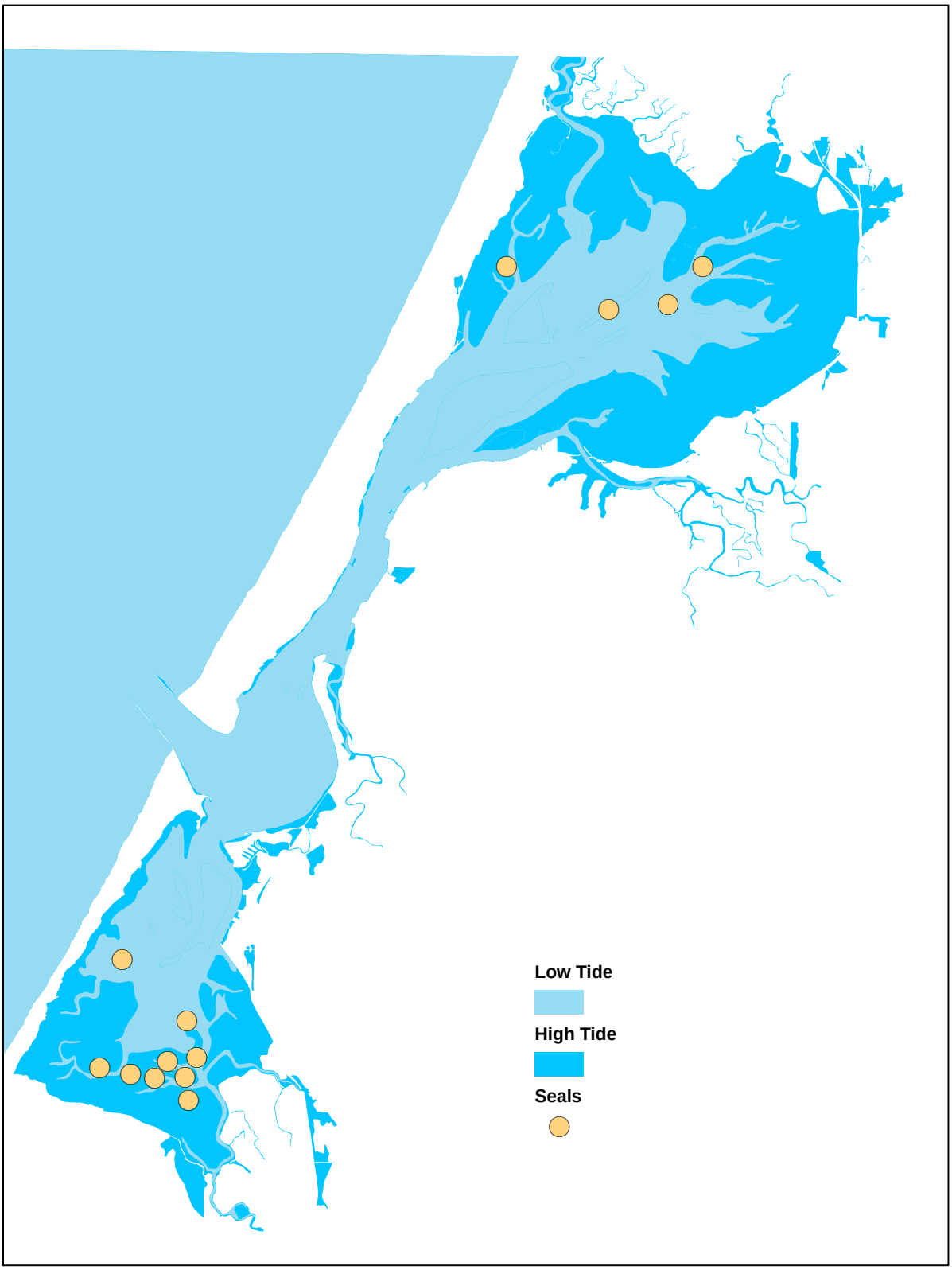

Low Tide
High Tide
Marsh Fluctuation

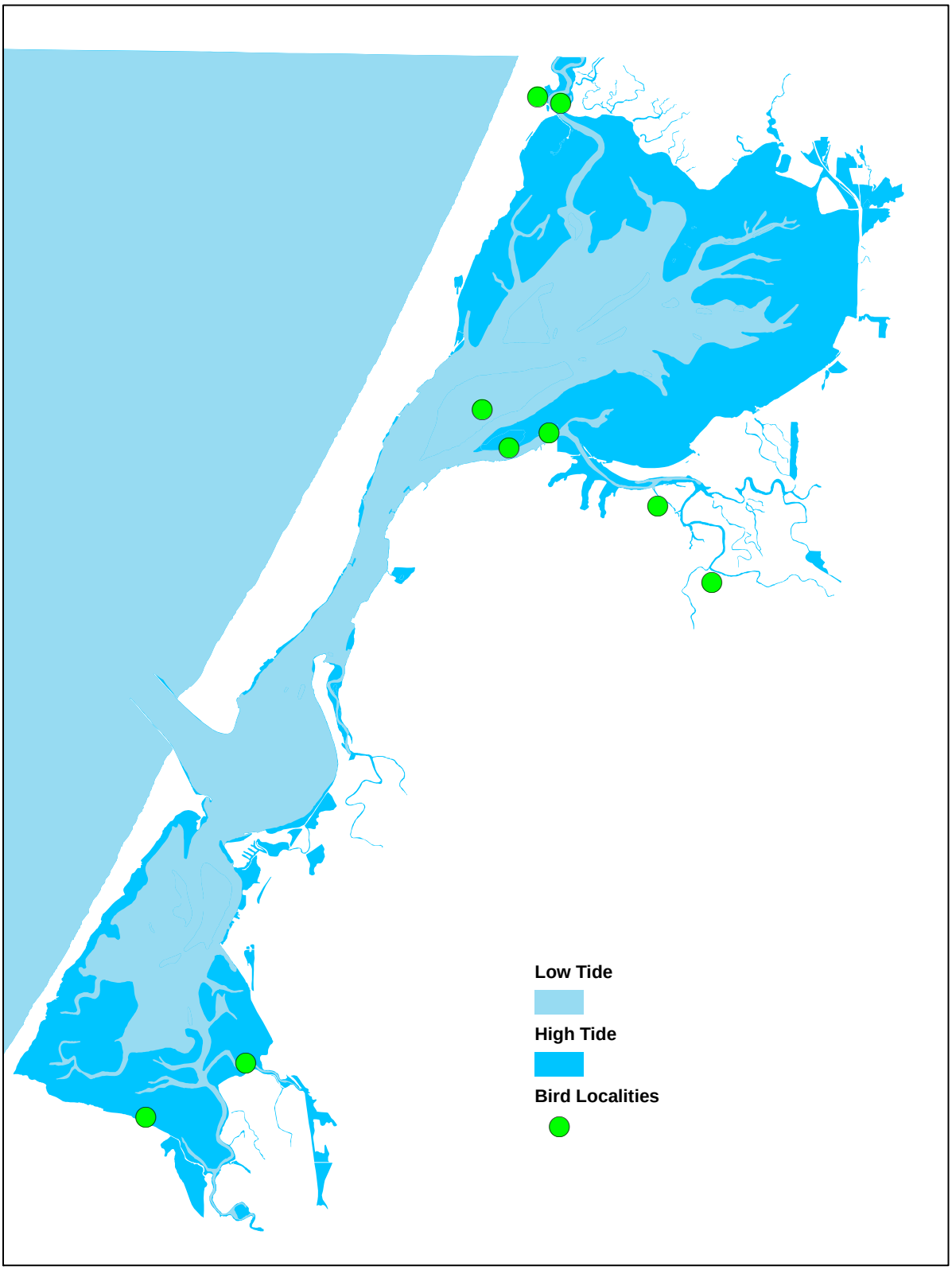

Low Tide
High Tide
Sediments
FACIES
CS
M
S
SC
SG
SS
SSC
VCS

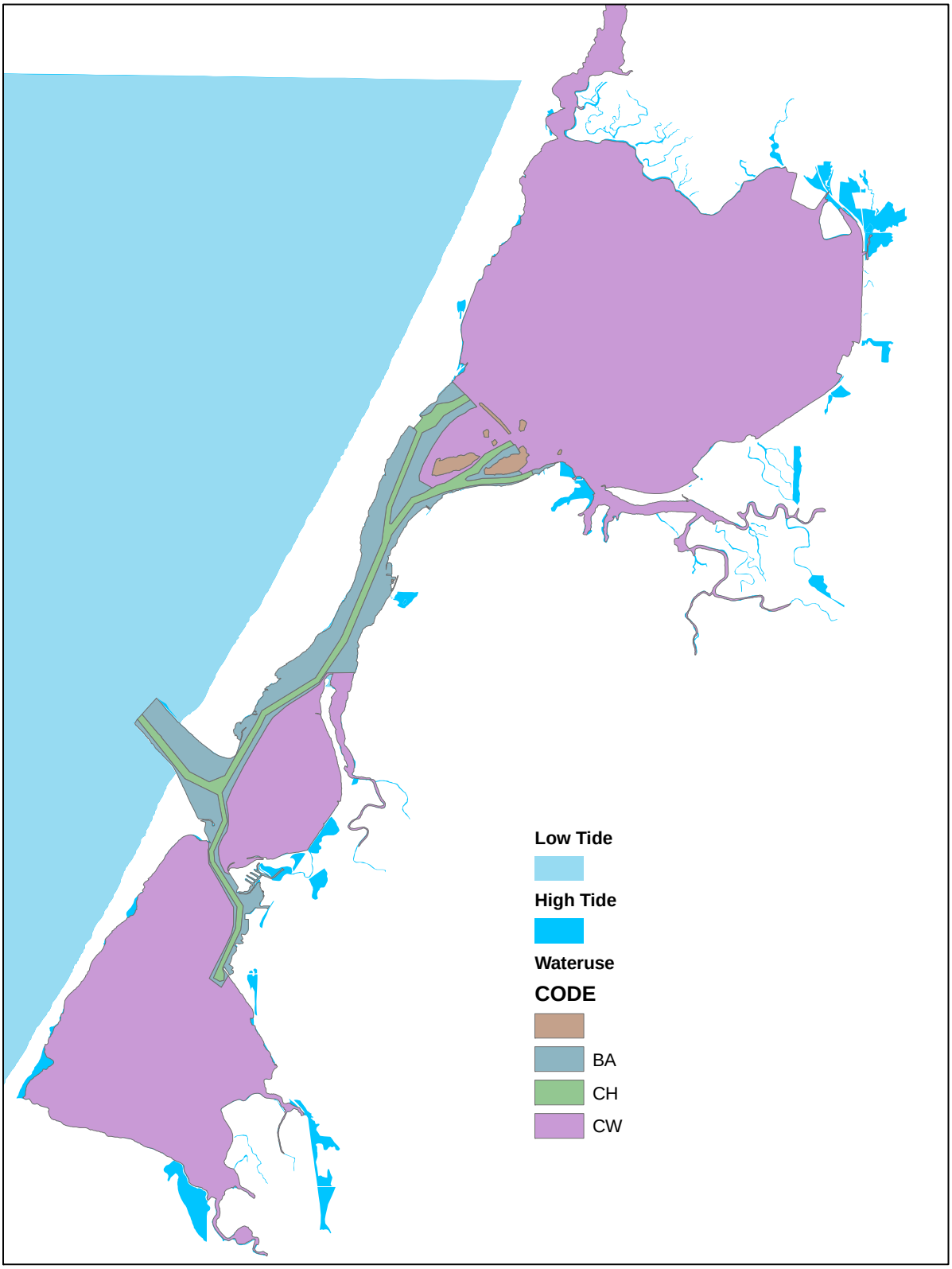

Low Tide
High Tide
1993 20' Contour

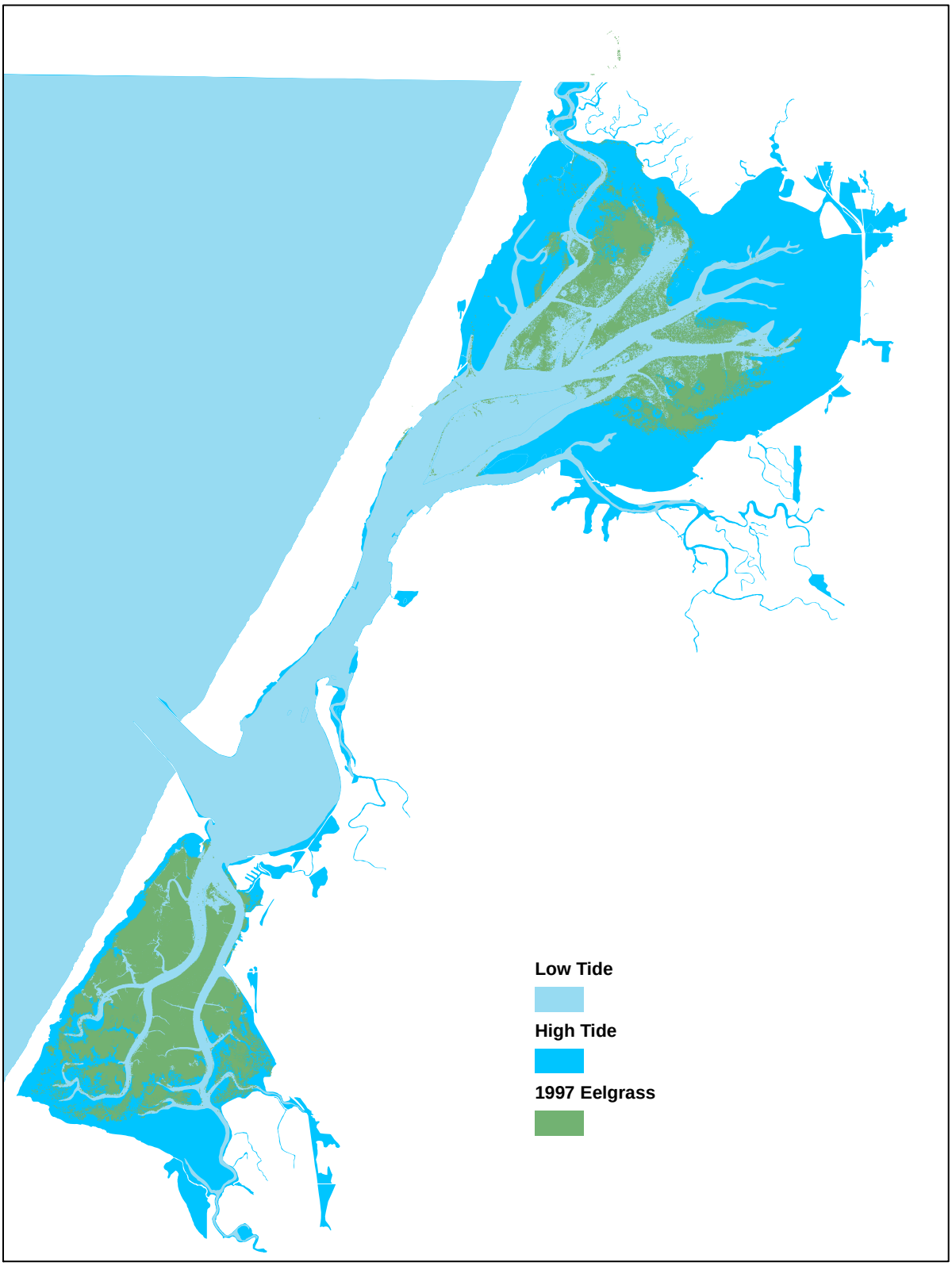

Low Tide
High Tide
Bird Habitat

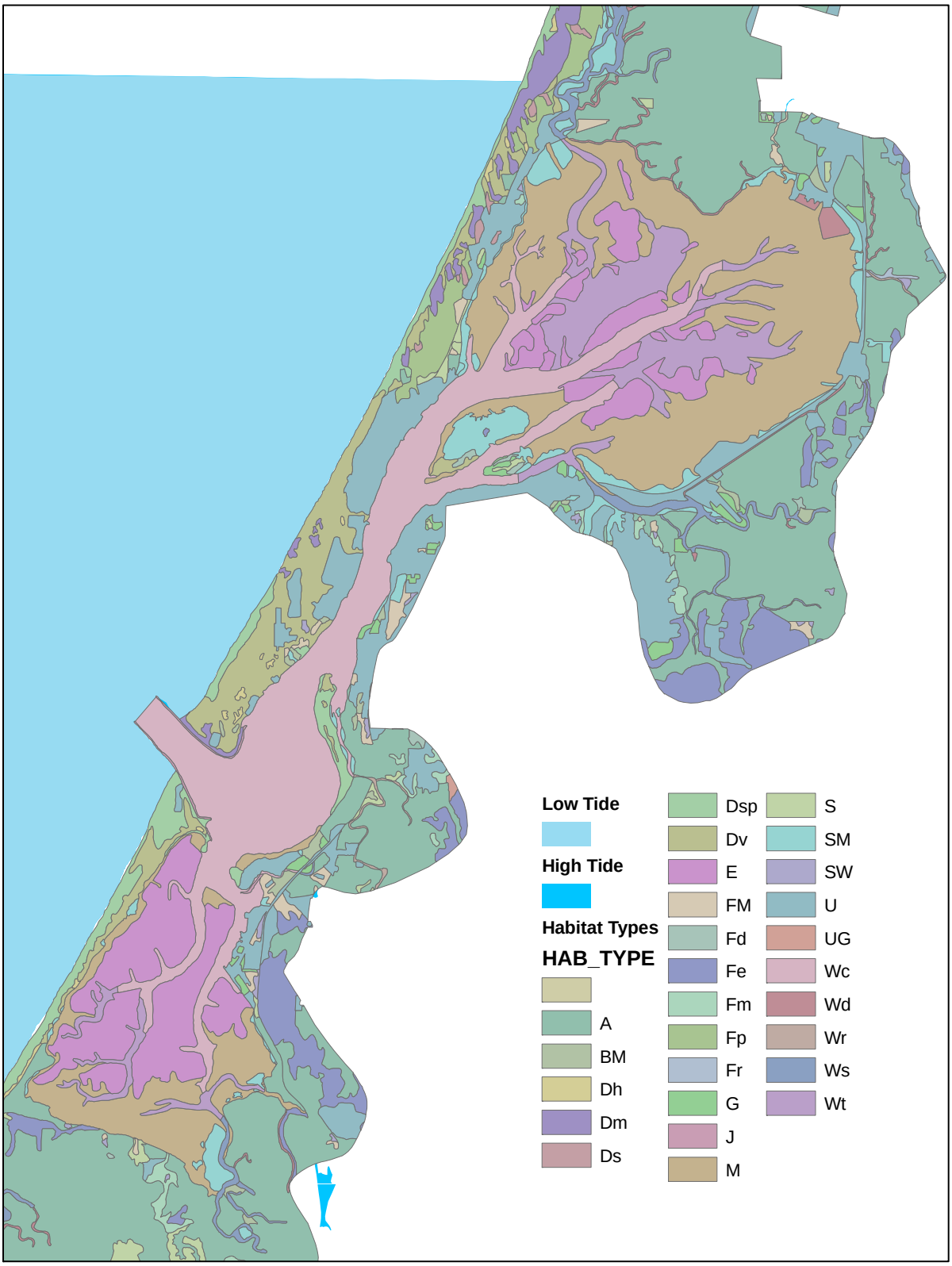

Low Tide
High Tide
Sphere of Interest

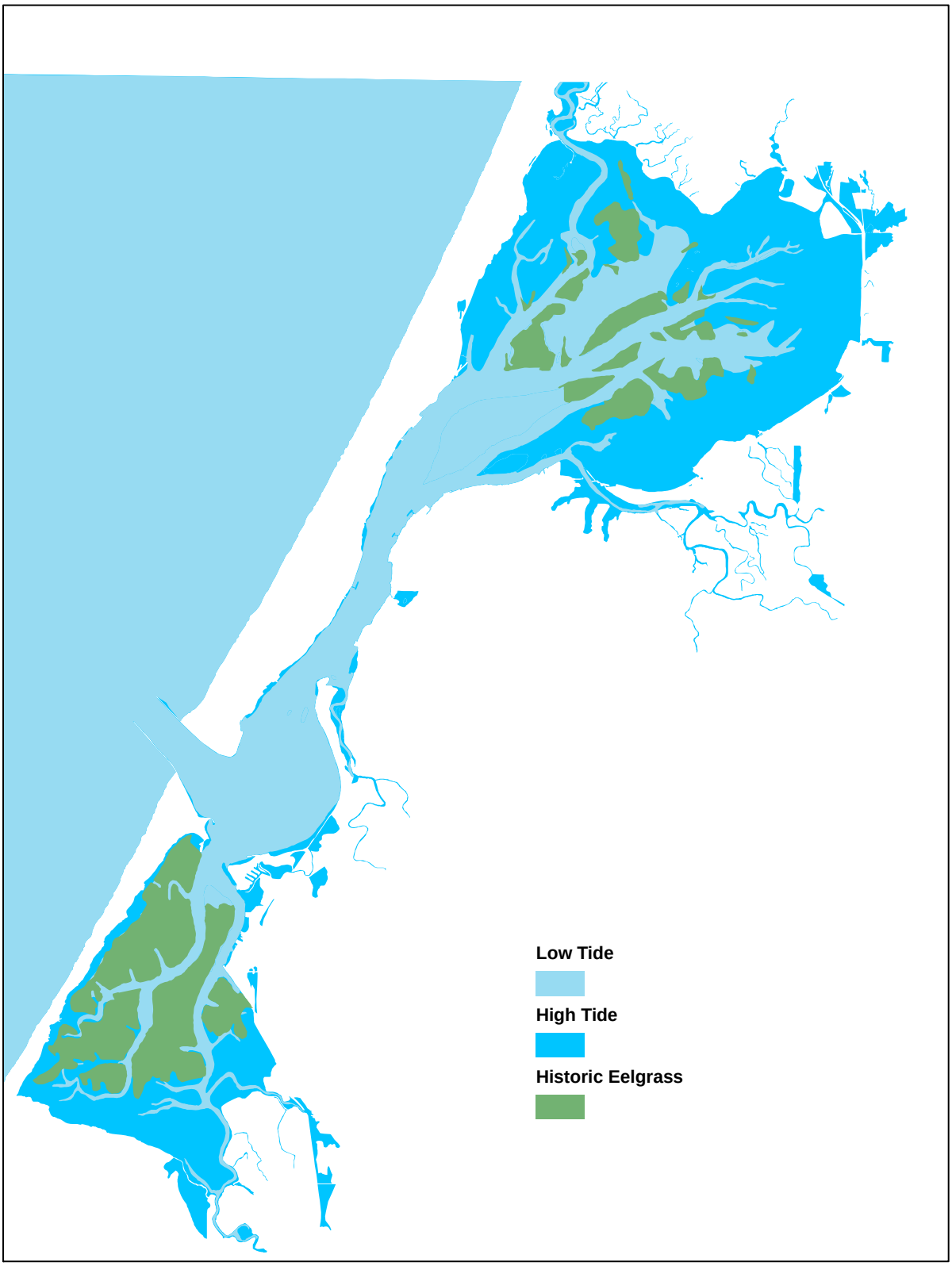

Low Tide
High Tide
Seals

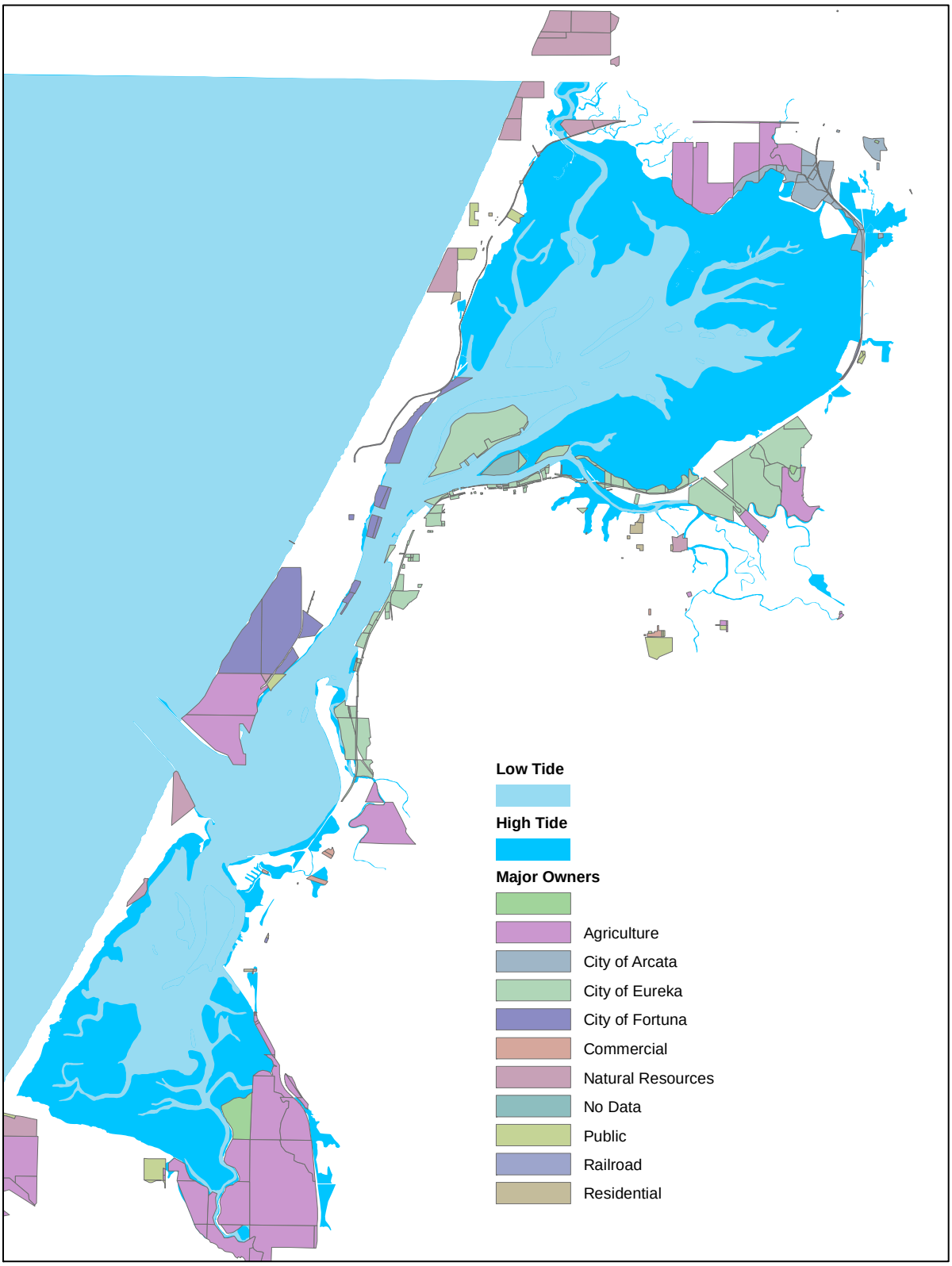

Low Tide
High Tide
Bird Localities

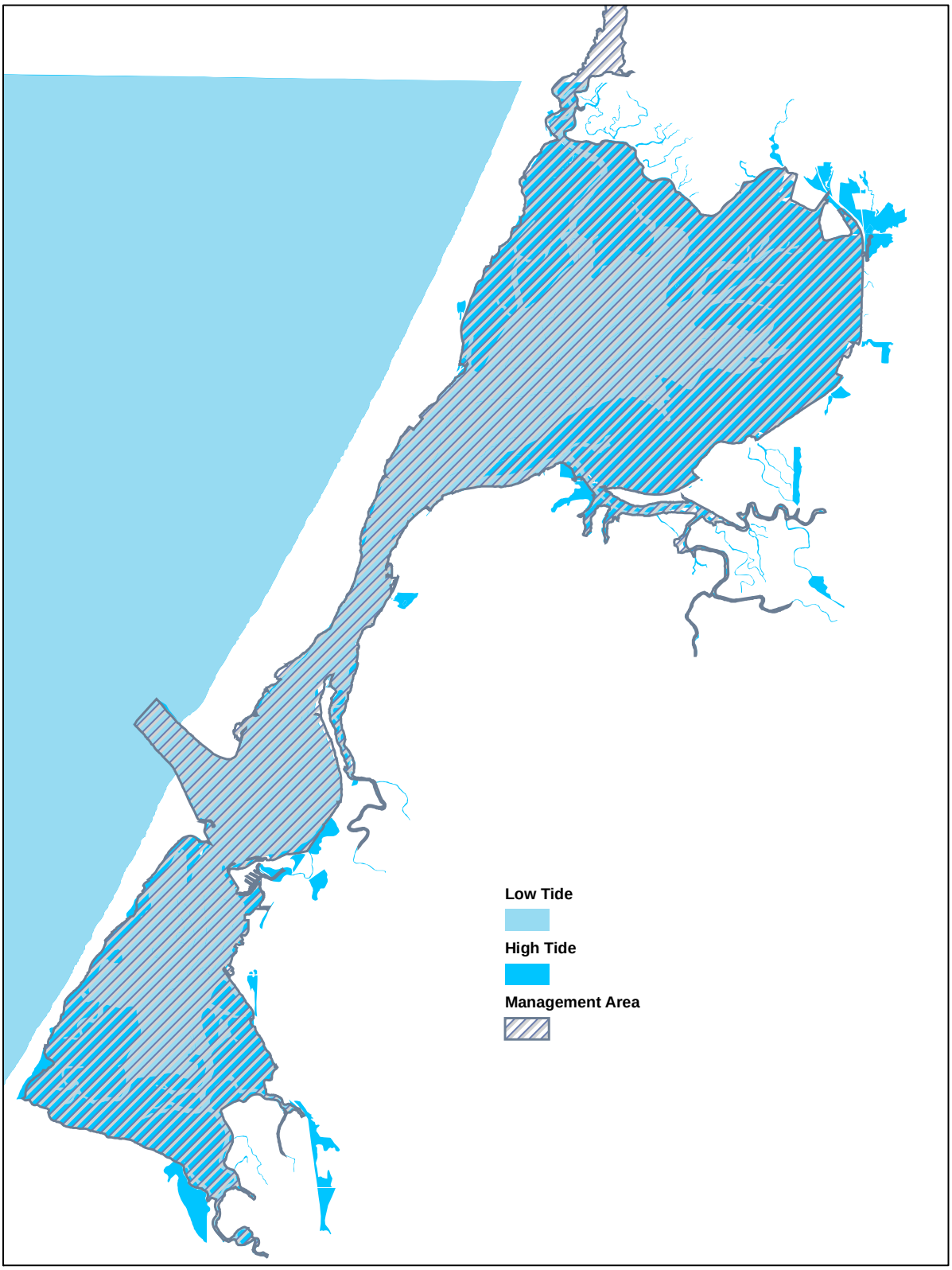

Low Tide
High Tide
Wateruse
CODE
BA
CH
CW

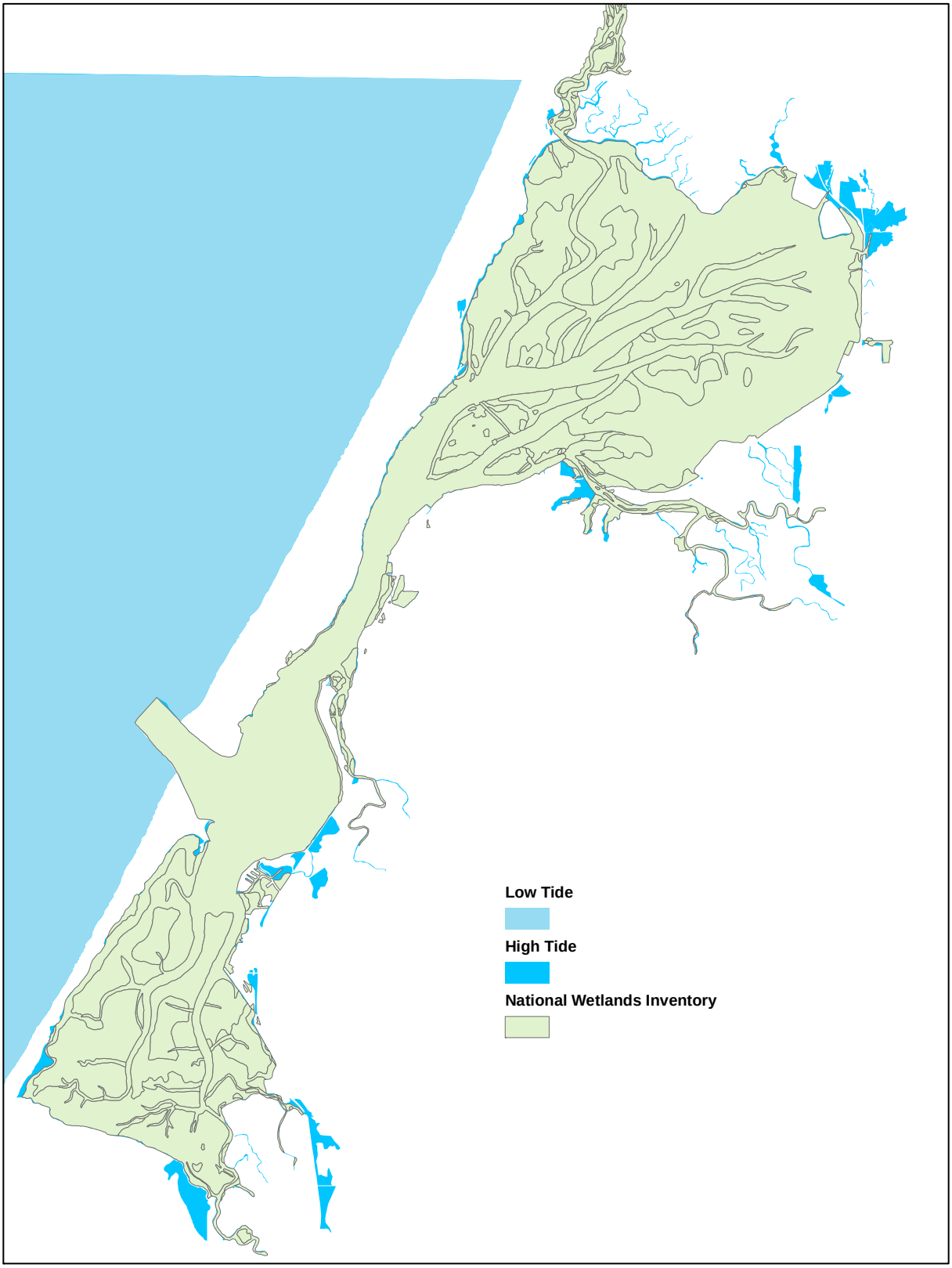

Low Tide
High Tide
1997 Eelgrass

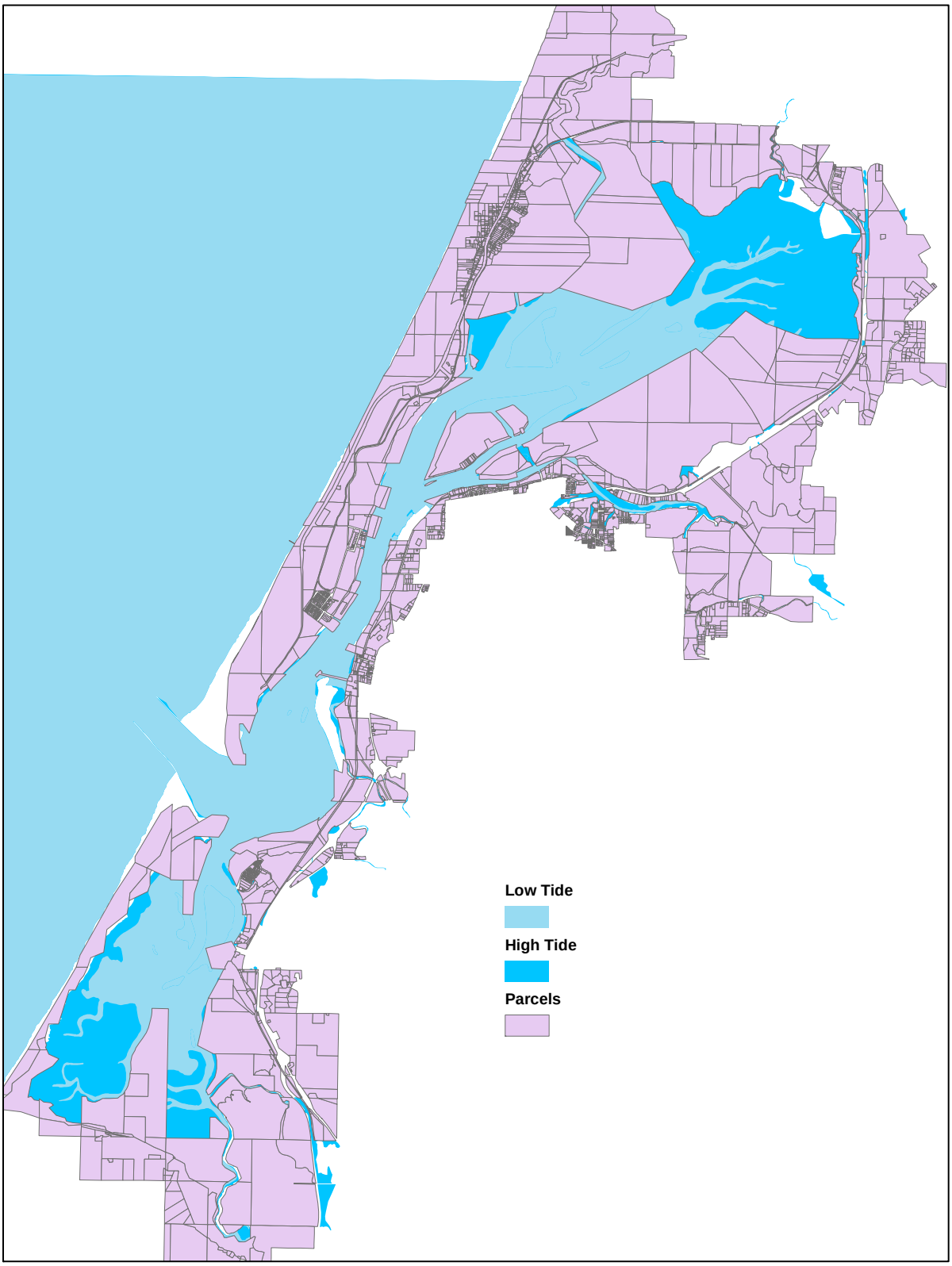

Low Tide
High Tide
Habitat Types
HAB_TYPE
A
BM
Dh
Dm
Ds
Dsp
Dv
E
FM
Fd
Fe
Fm
Fp
Fr
G
J
M
S
SM
SW
U
UG
Wc
Wd
Wr
Ws
Wt

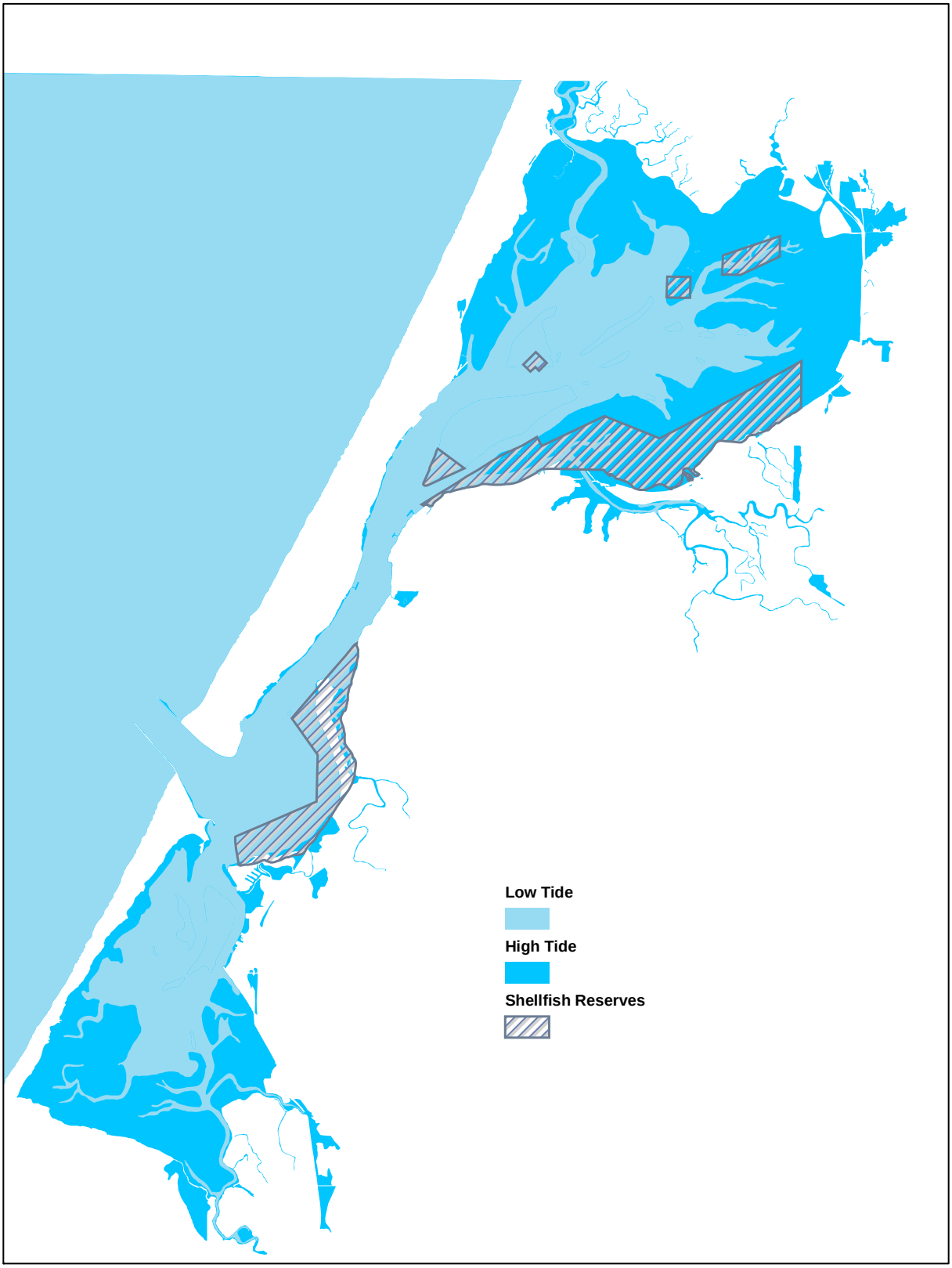

Low Tide
High Tide
Historic Eelgrass

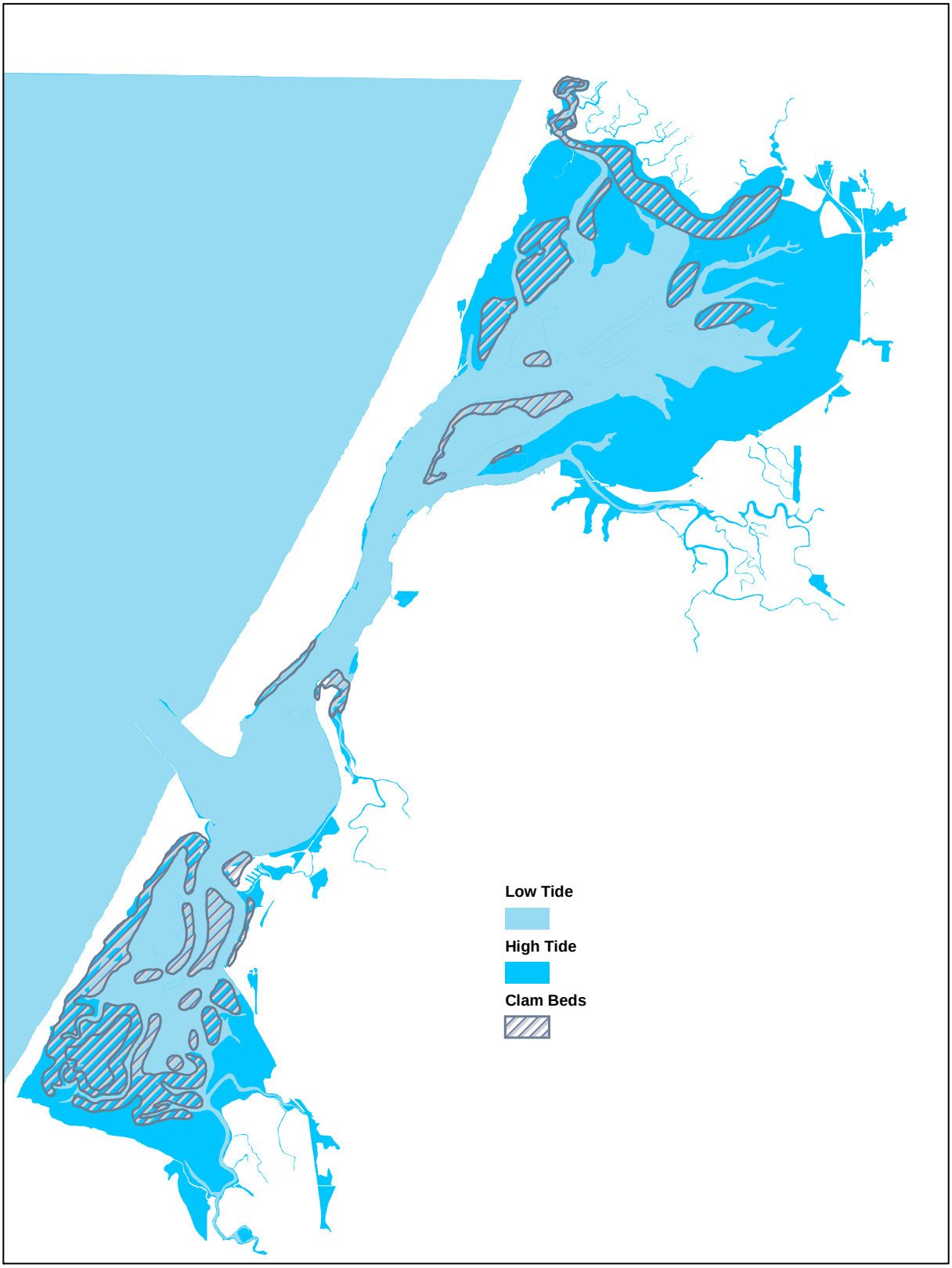

Low Tide
High Tide
Major Owners
Agriculture
City of Arcata
City of Eureka
City of Fortuna
Commercial
Natural Resources
No Data
Public
Railroad
Residential

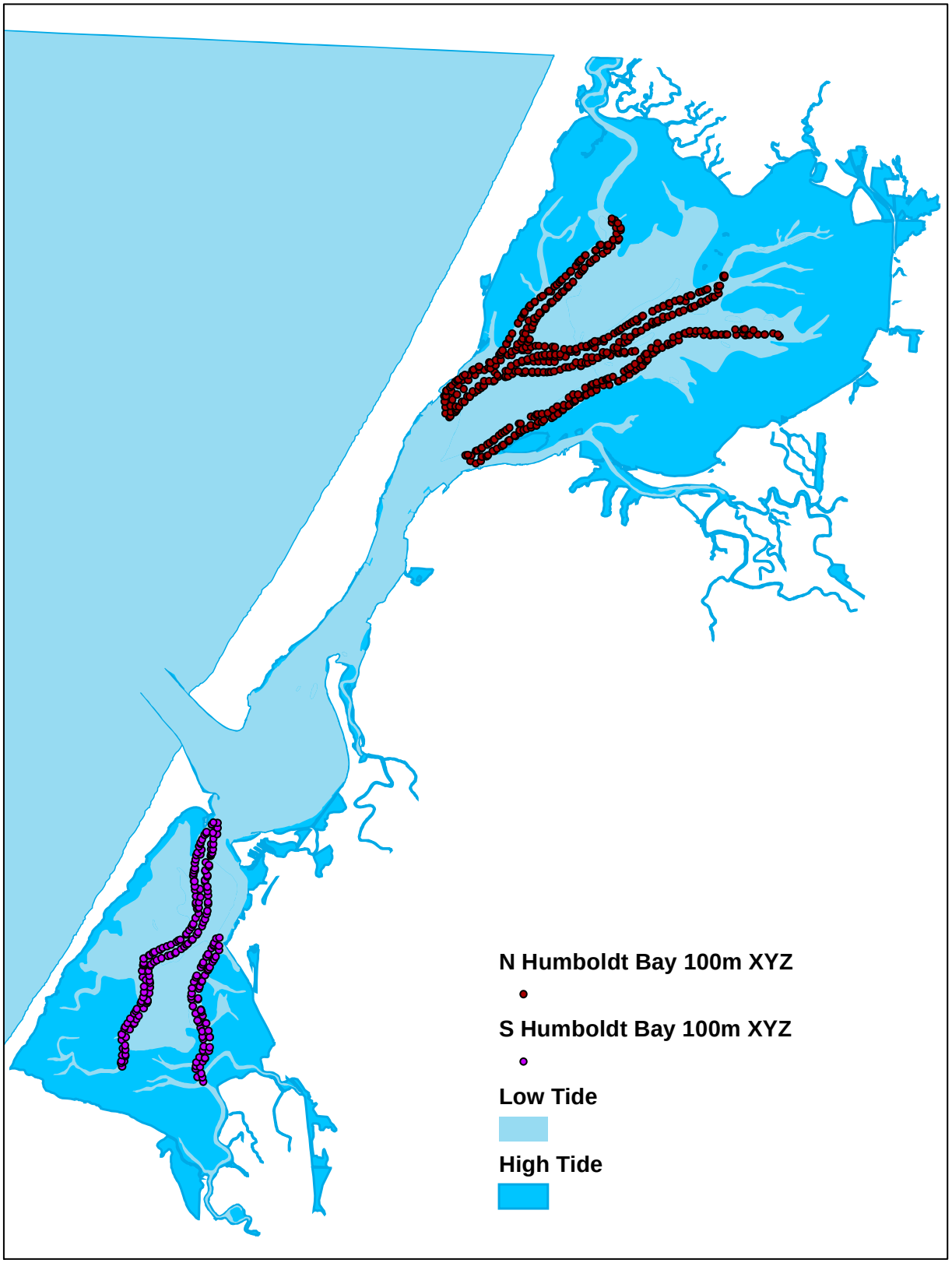

Low Tide
High Tide
Management Area

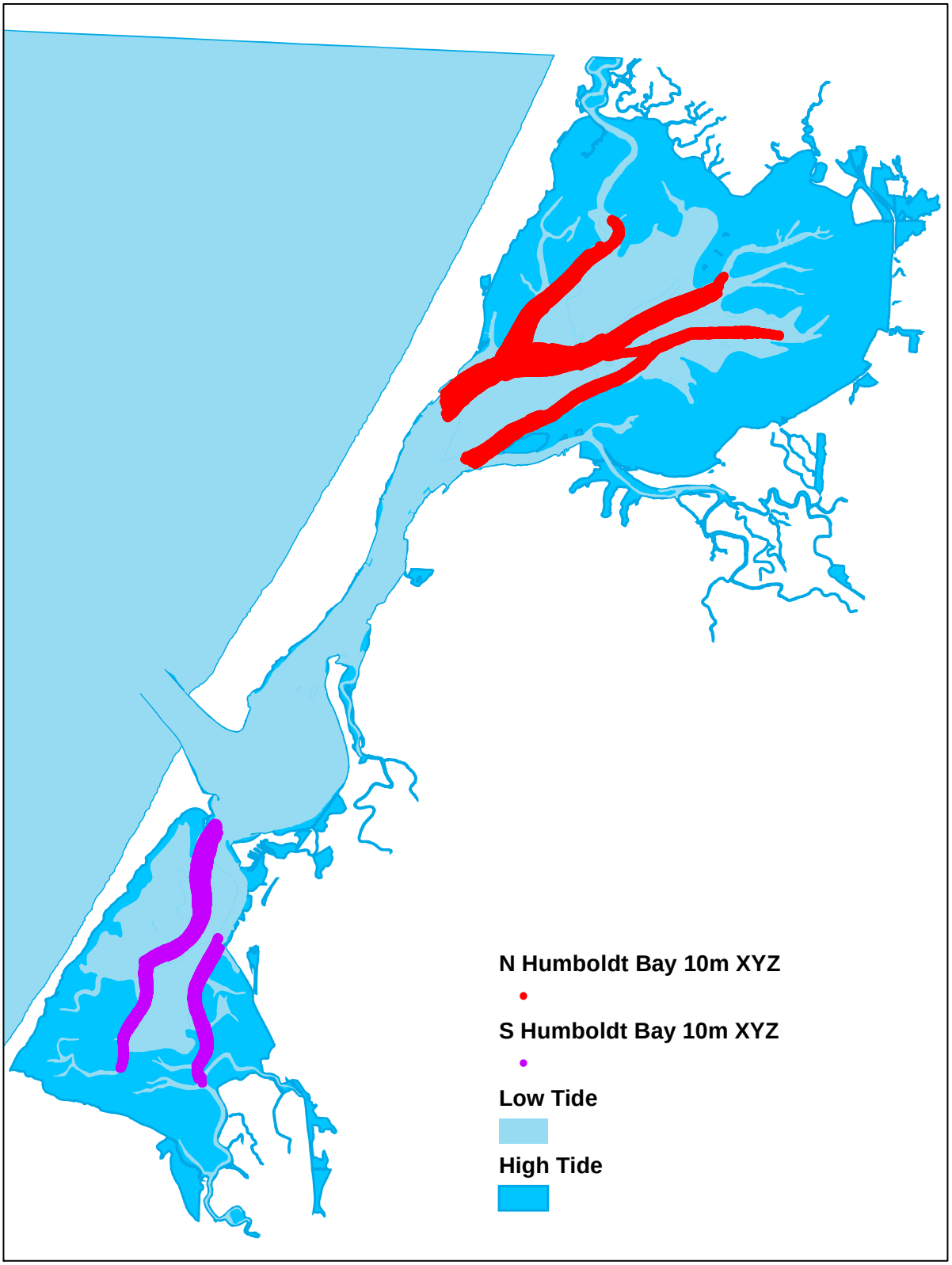

Low Tide
High Tide
National Wetlands Inventory

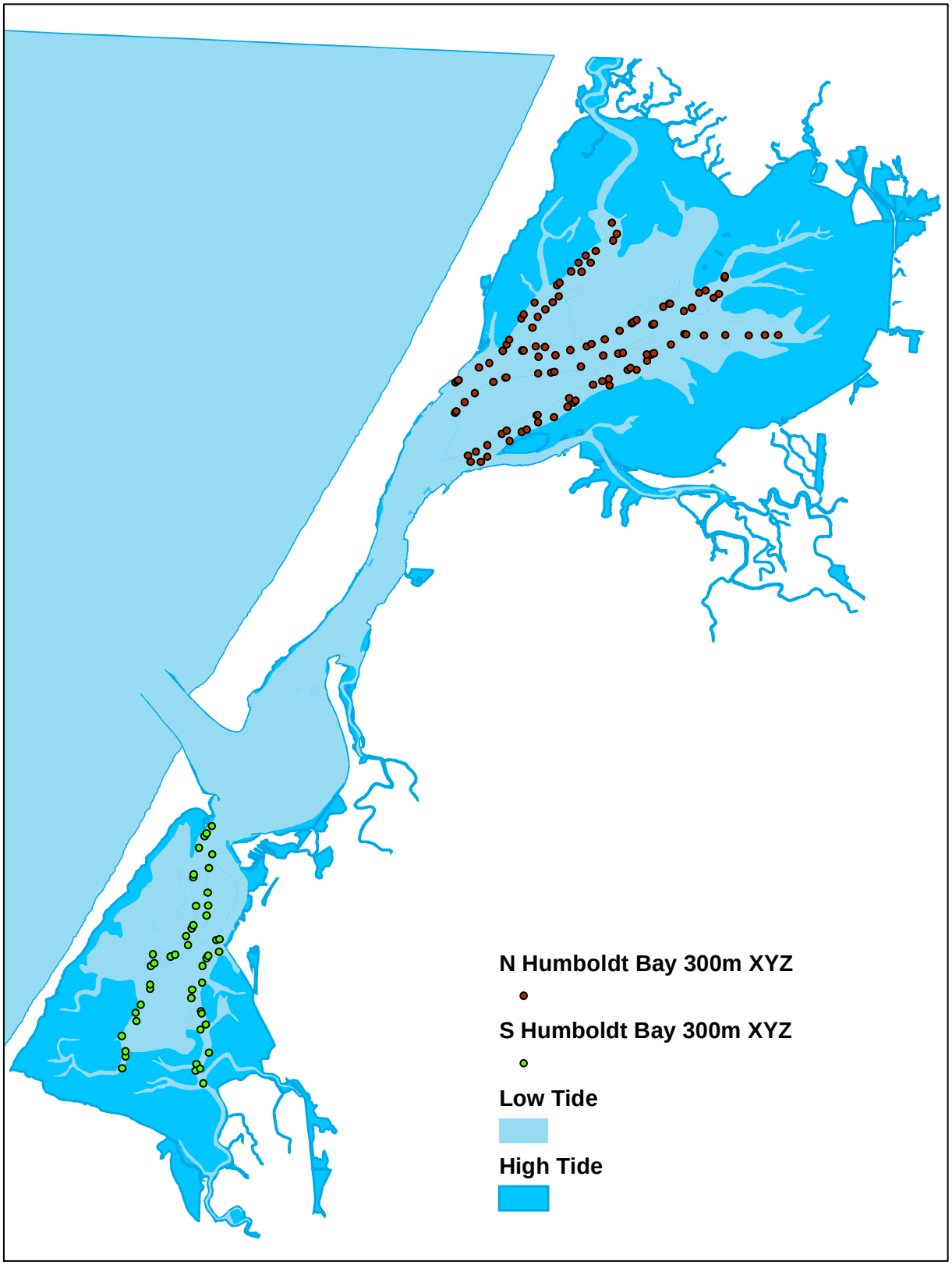

Low Tide
High Tide
Parcels

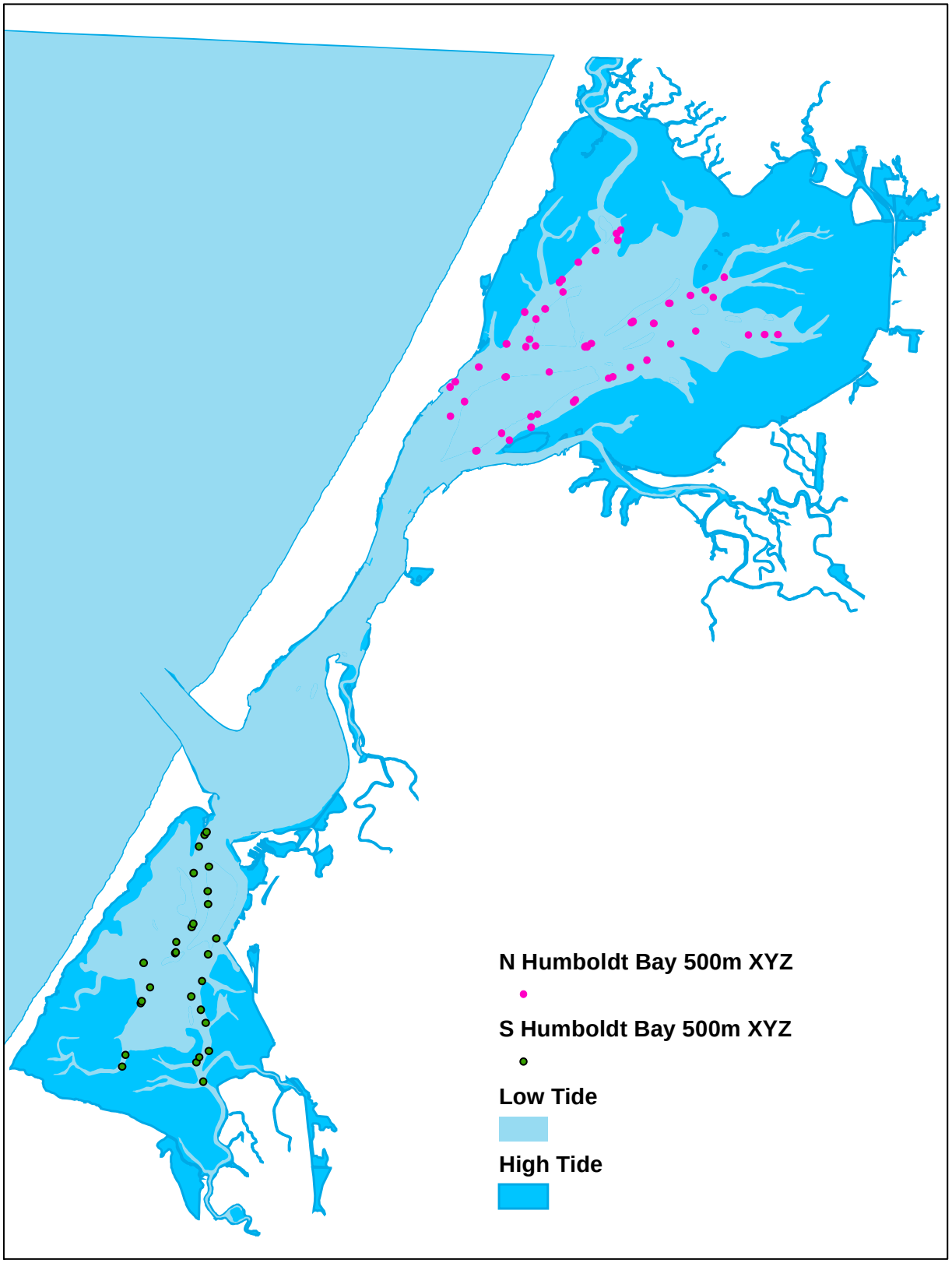

Low Tide
High Tide
Shellfish Reserves

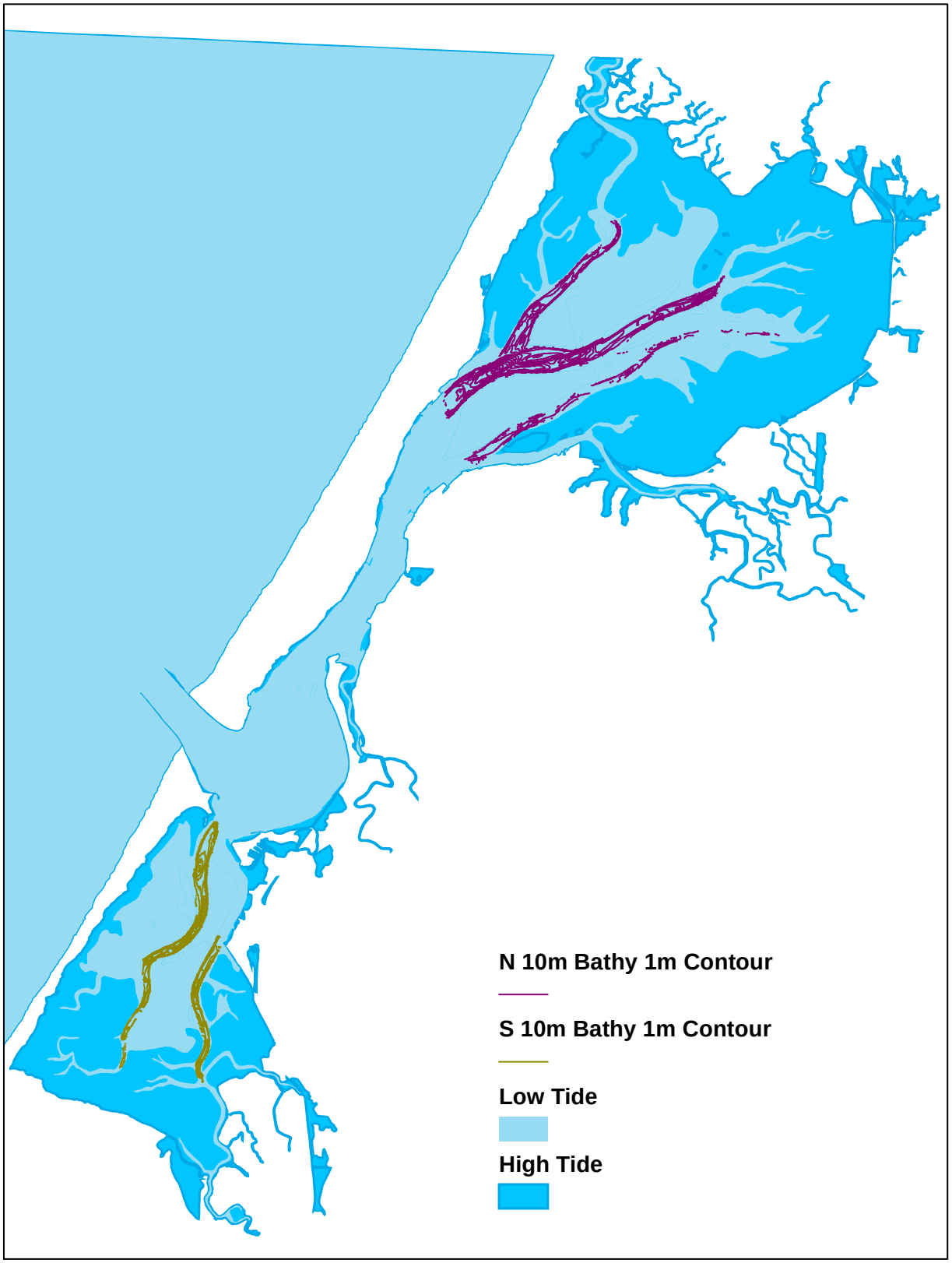

Low Tide
High Tide
Clam Beds

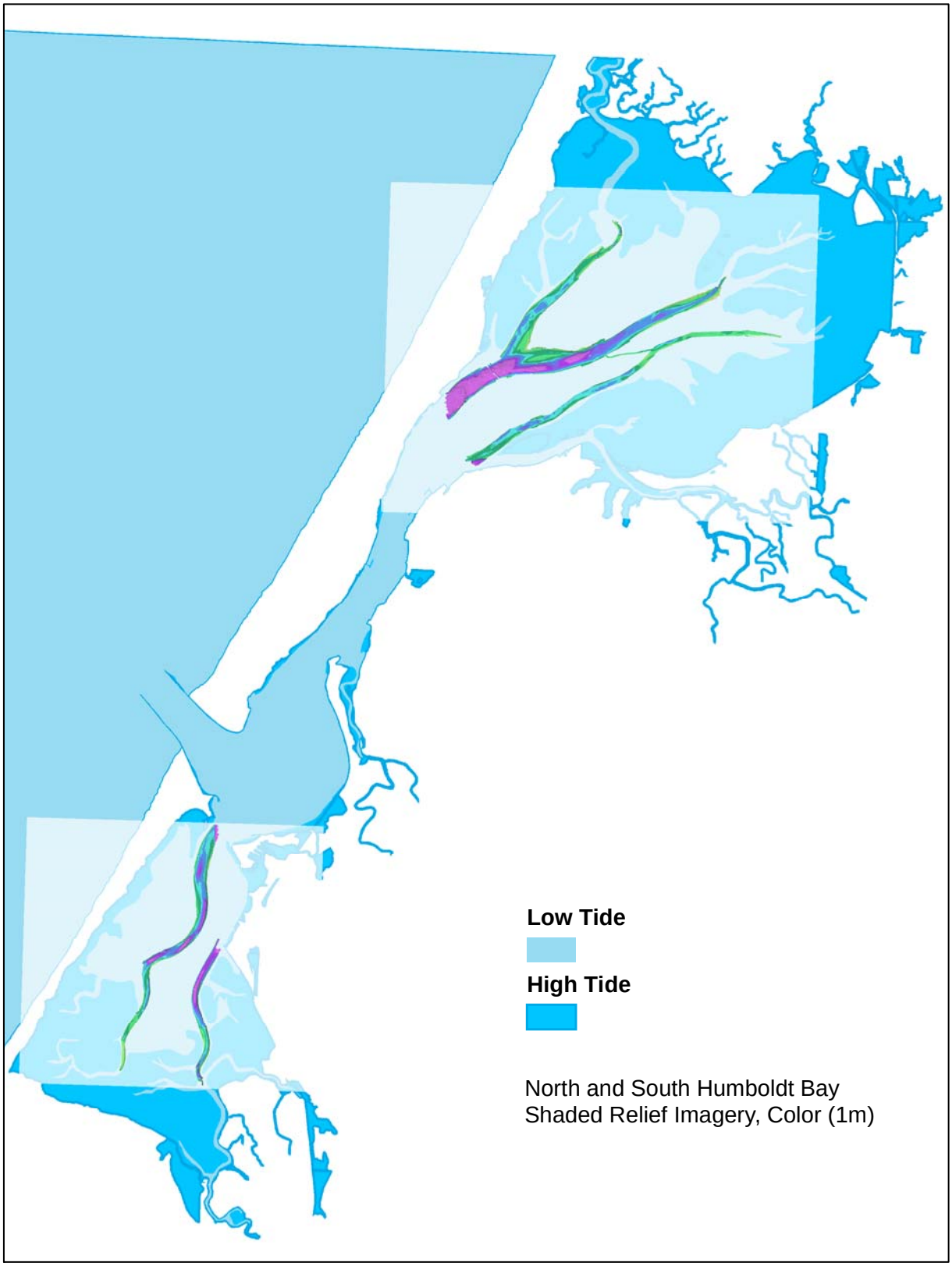

N Humboldt Bay 100m XYZ
S Humboldt Bay 100m XYZ
Low Tide
High Tide

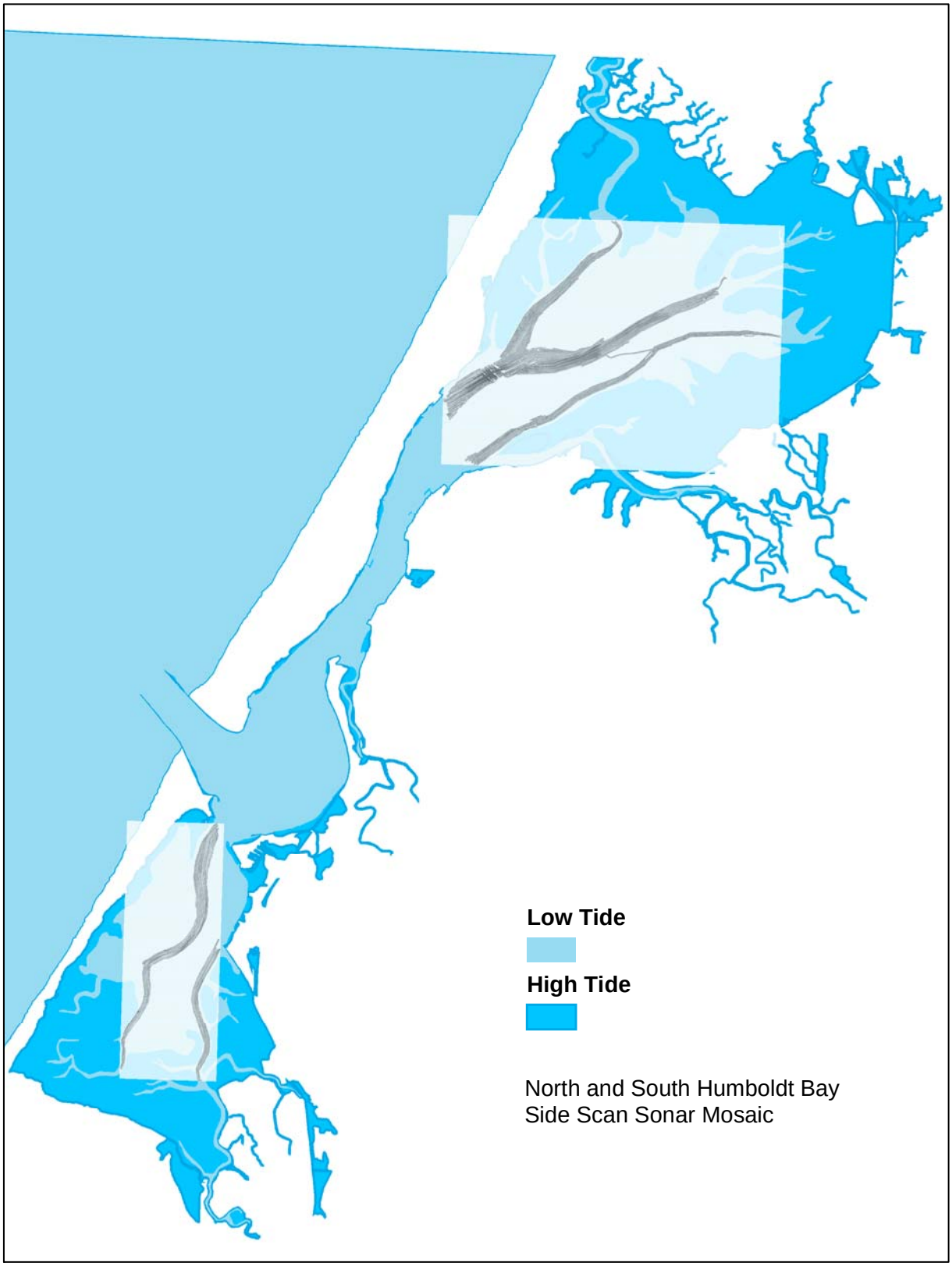

N Humboldt Bay 10m XYZ
S Humboldt Bay 10m XYZ
Low Tide
High Tide

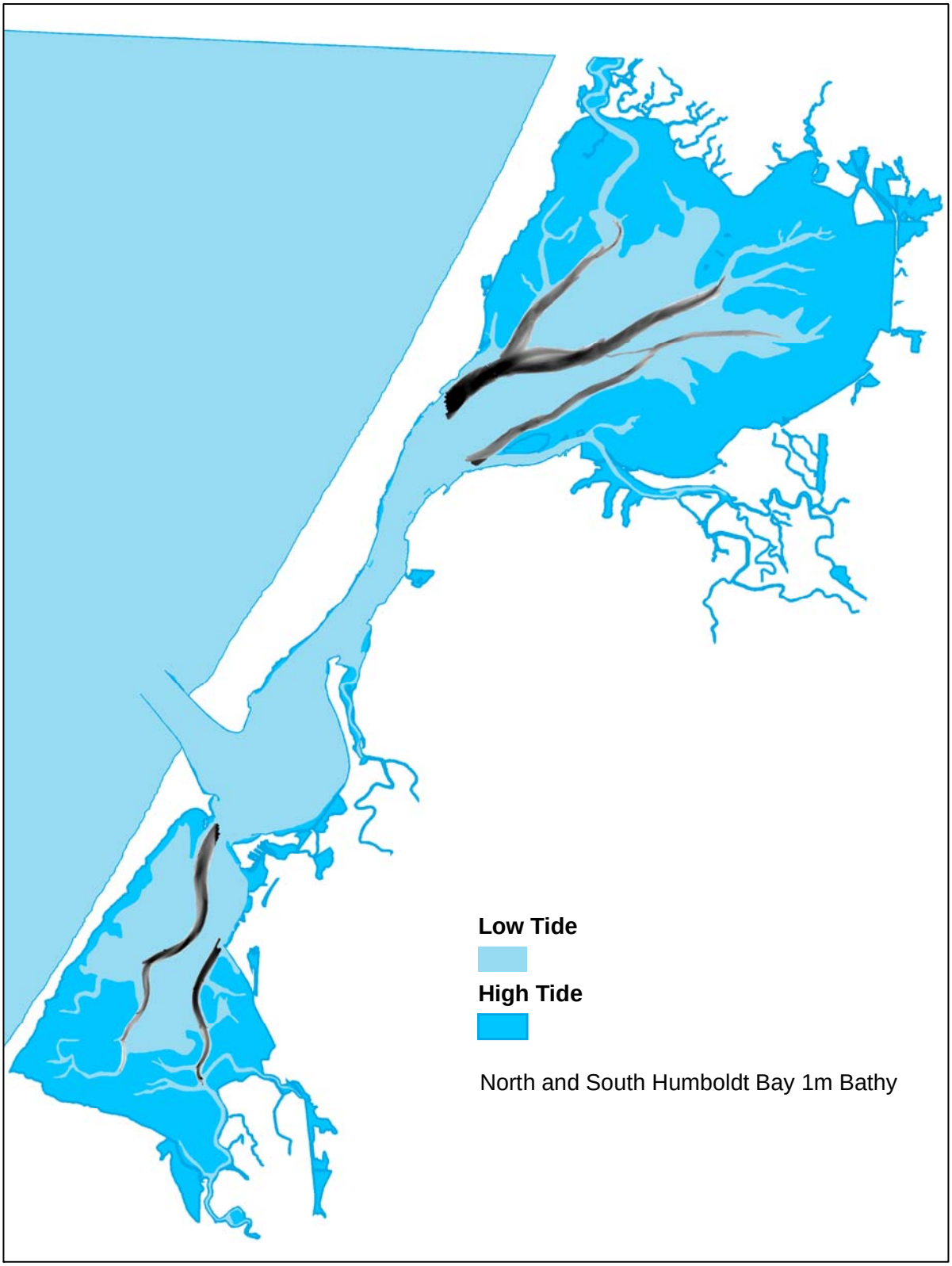

N Humboldt Bay 300m XYZ
S Humboldt Bay 300m XYZ
Low Tide
High Tide

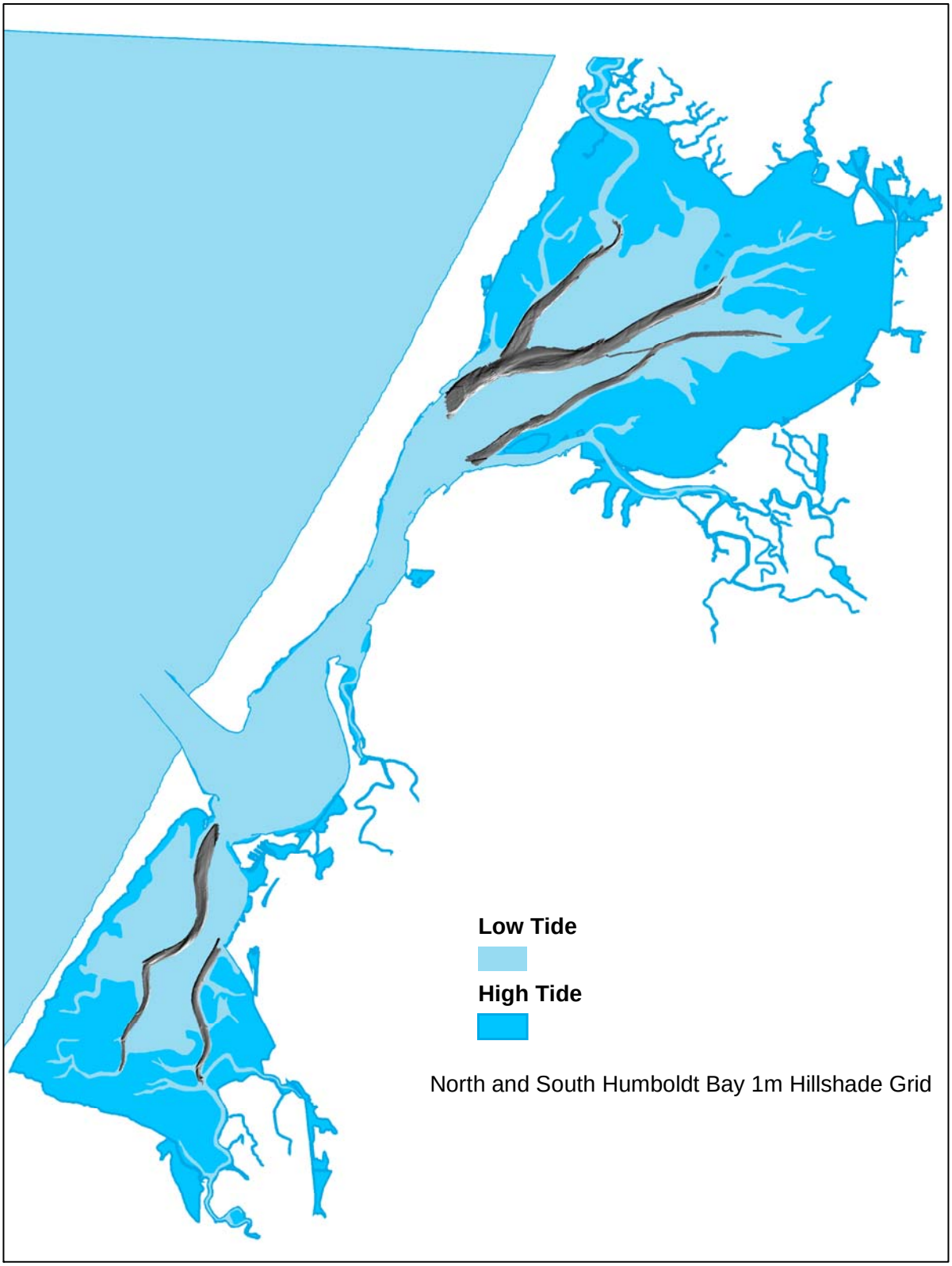

N Humboldt Bay 500m XYZ
S Humboldt Bay 500m XYZ
Low Tide
High Tide


N 10m Bathy 1m Contour
S 10m Bathy 1m Contour
Low Tide
High Tide

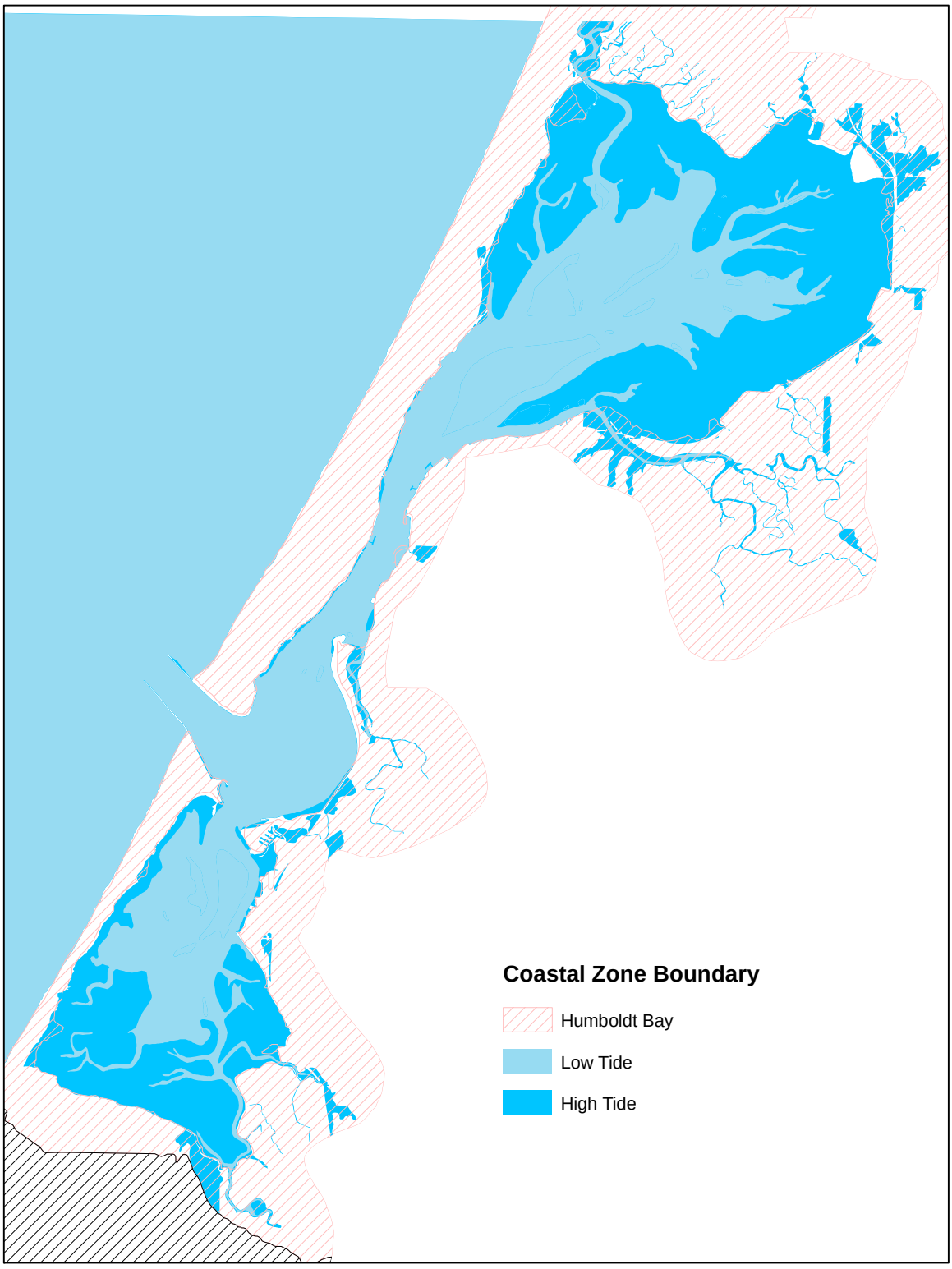

Low Tide
High Tide
North and South Humboldt Bay
Shaded Relief Imagery, Color (1m)

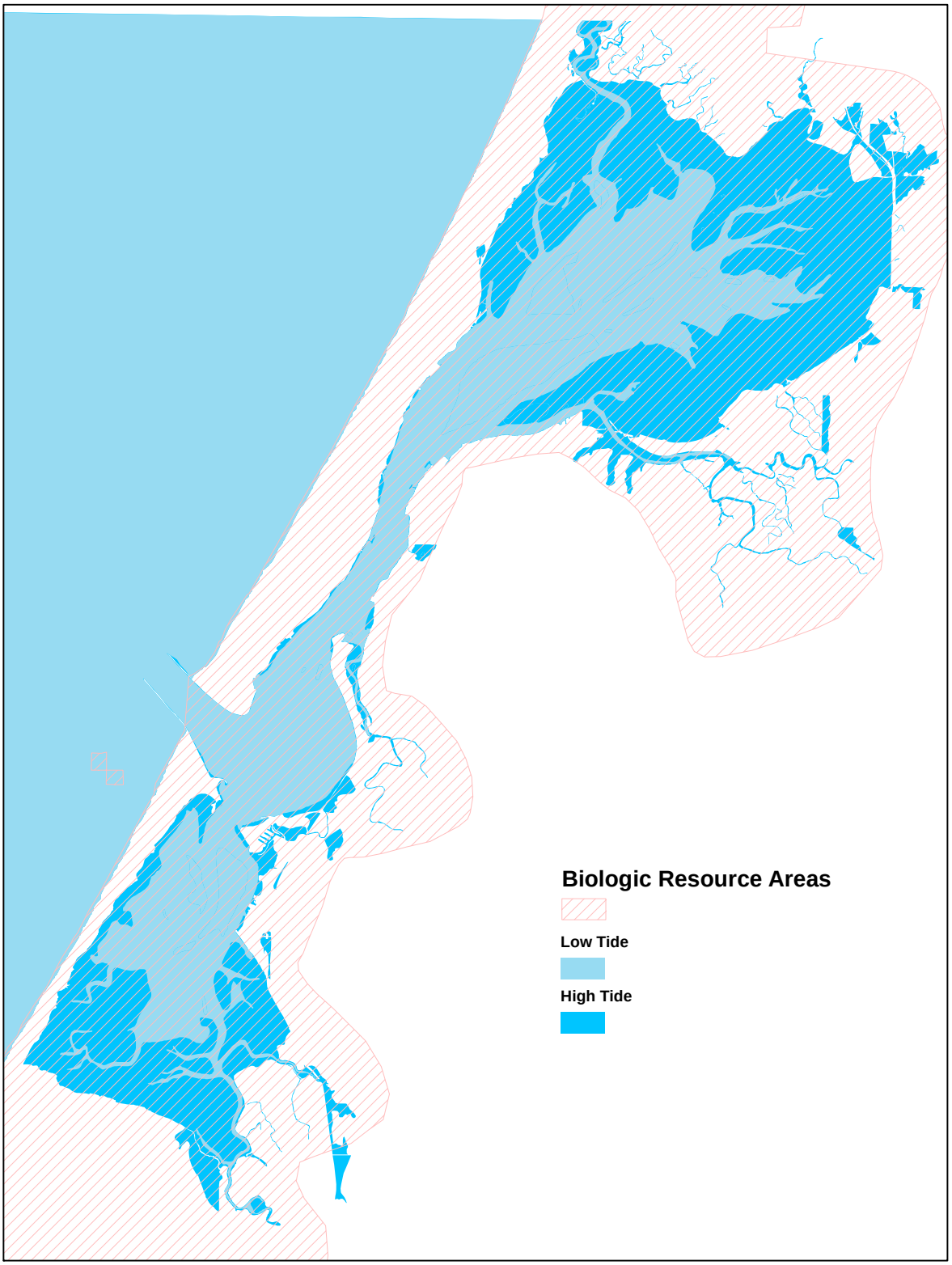

Low Tide
High Tide
North and South Humboldt Bay
Side Scan Sonar Mosaic

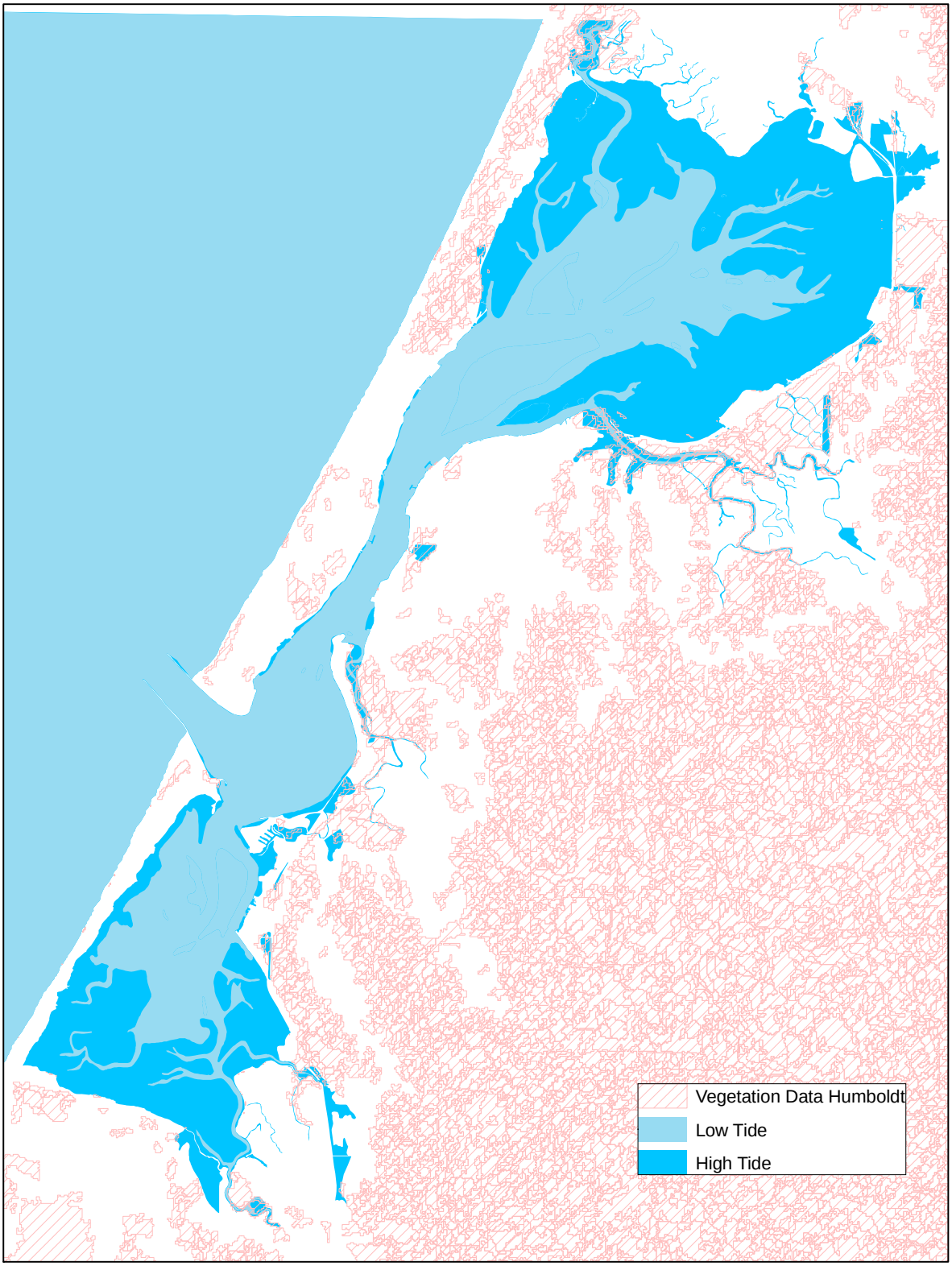

Low Tide
High Tide
North and South Humboldt Bay 1m Bathy

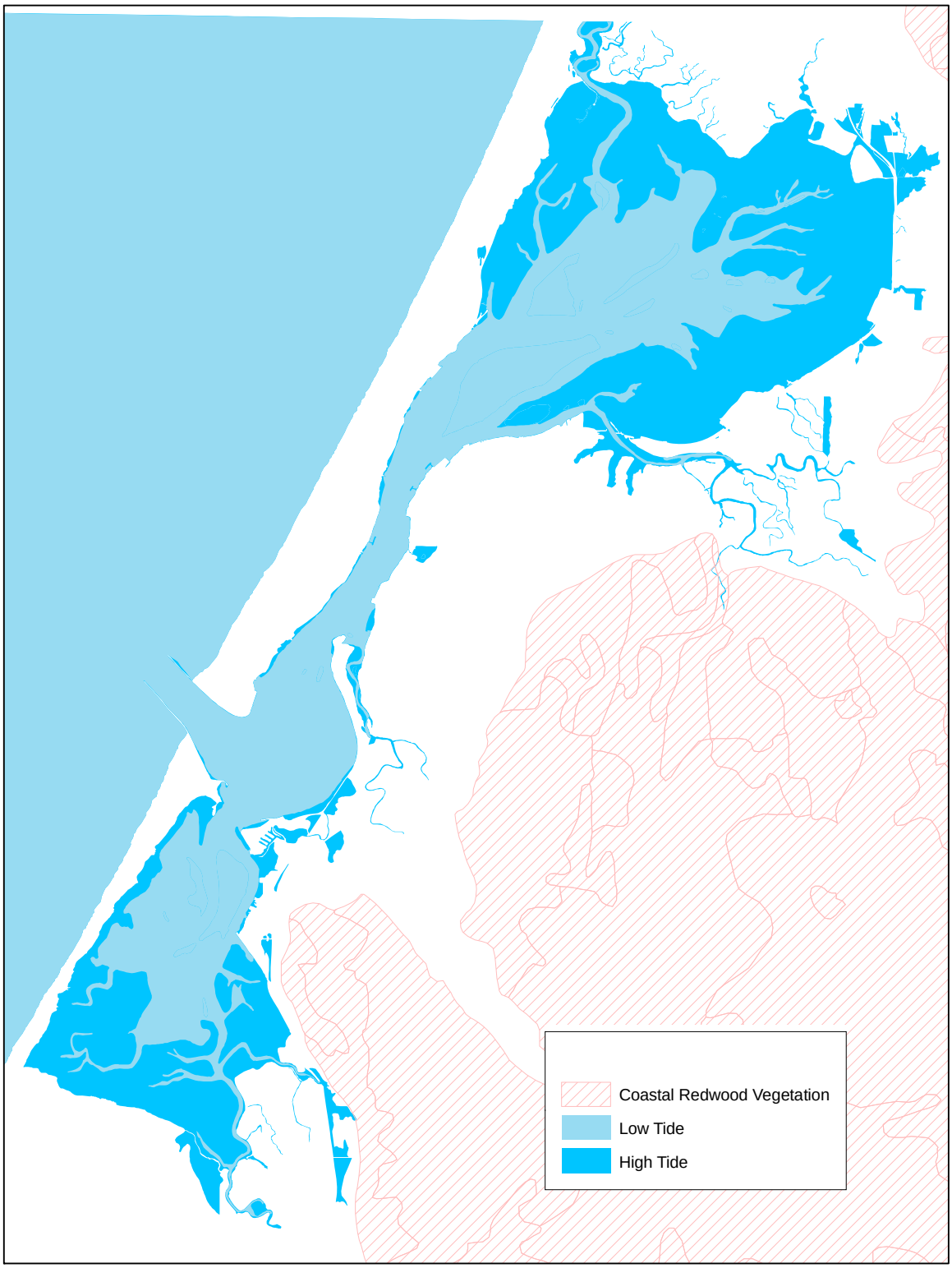

Low Tide
High Tide
North and South Humboldt Bay 1m Hillshade Grid

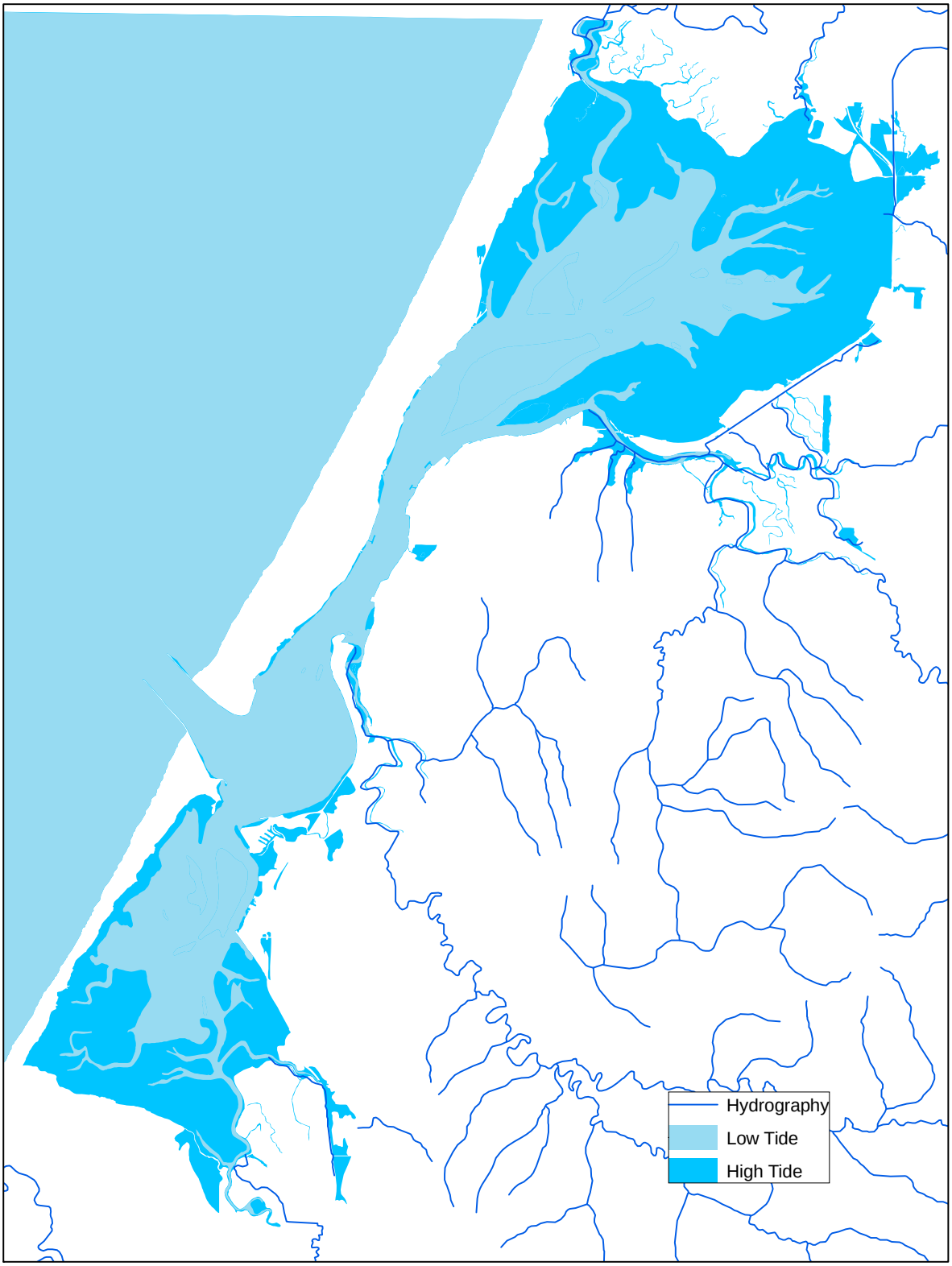

Low Tide
High Tide
North and South Humboldt Bay 1m Slope

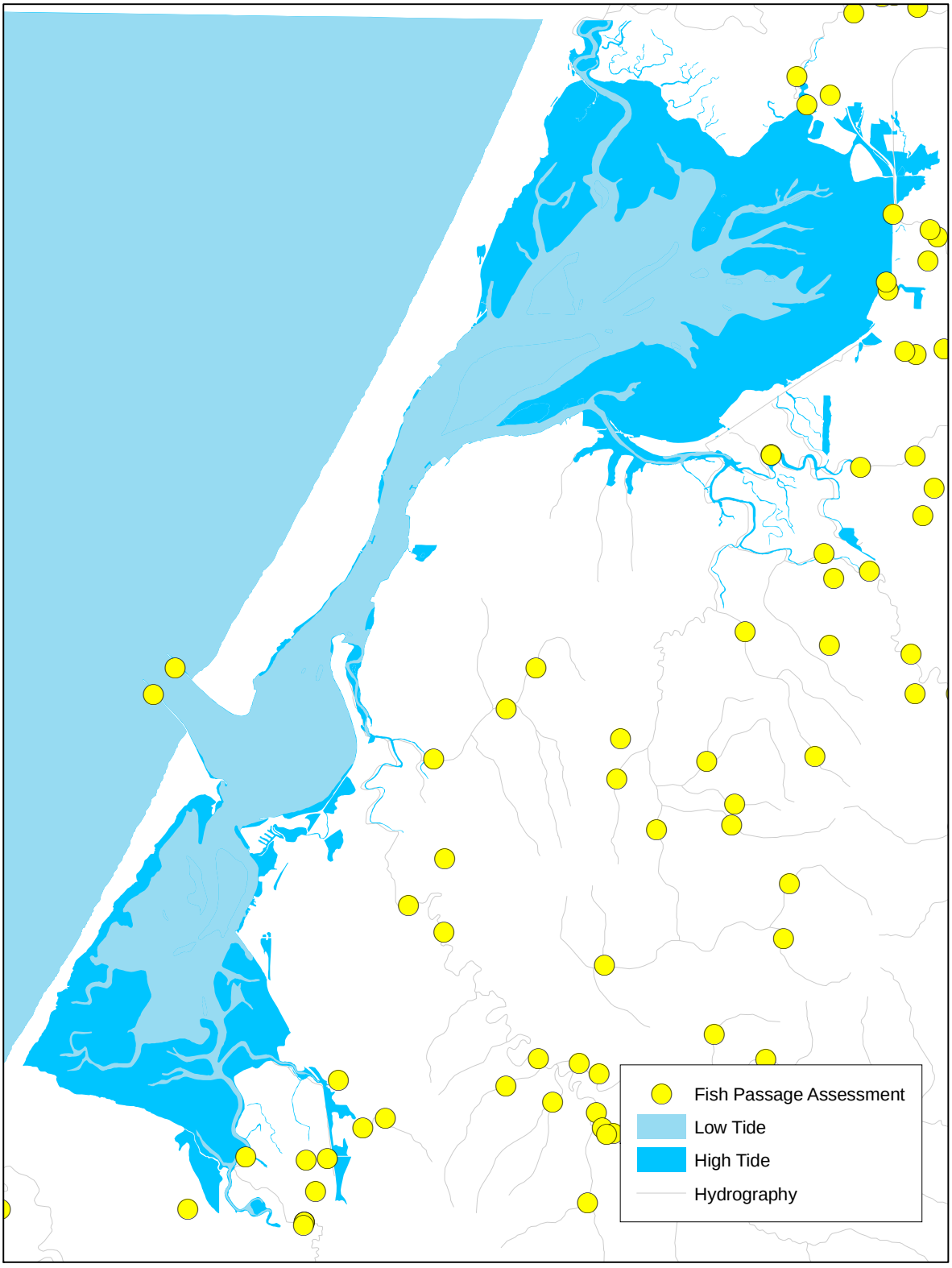

Coastal Zone Boundary
Humboldt Bay
Low Tide
High Tide

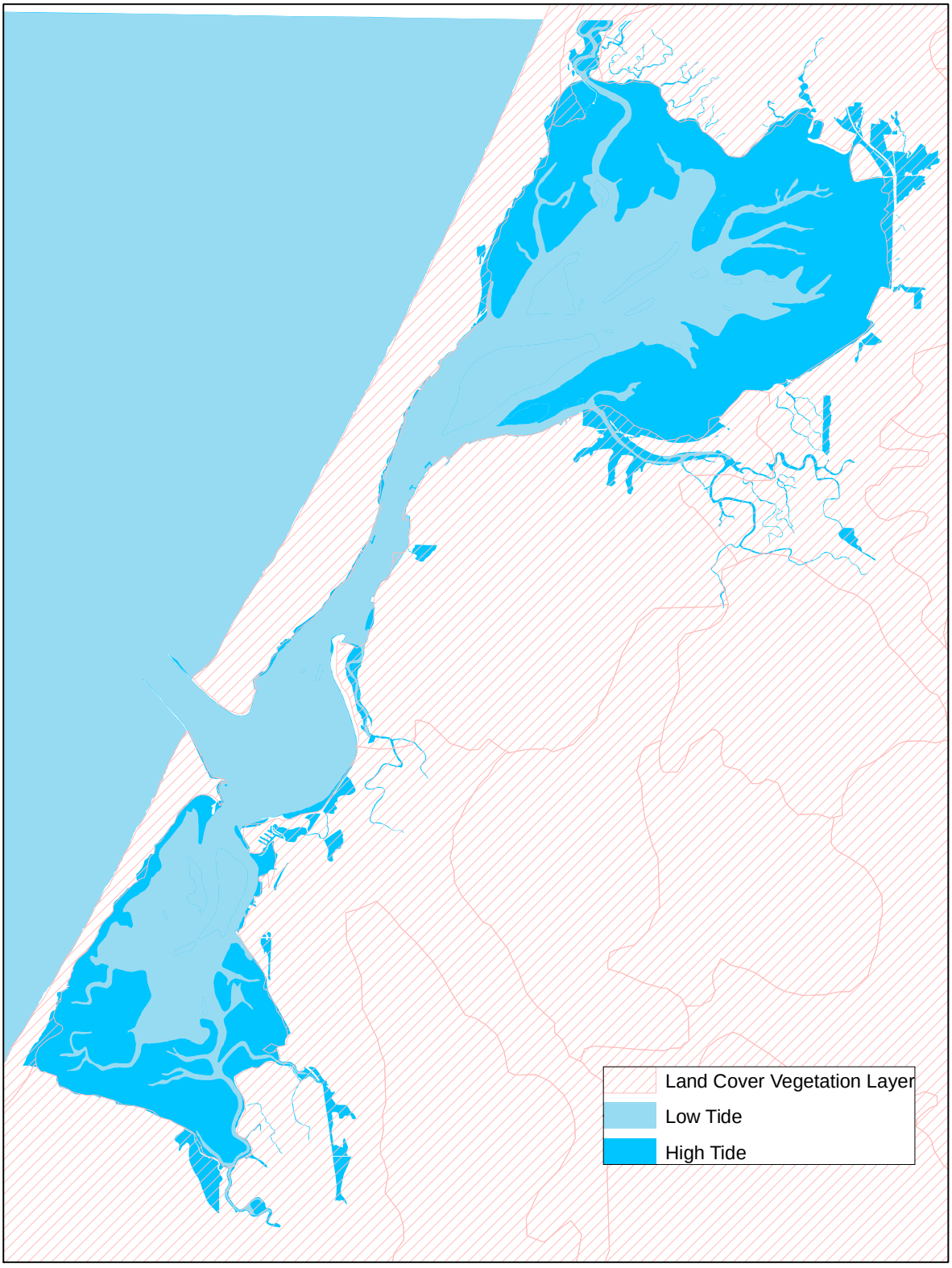

Biologic Resource Areas
Low Tide
High Tide


Vegetation Data Humboldt
Low Tide
High Tide


Coastal Redwood Vegetation
Low Tide
High Tide


Hydrography
Low Tide
High Tide


Fish Passage Assessment
Low Tide
High Tide
Hydrography


Land Cover Vegetation Layer
Low Tide
High Tide