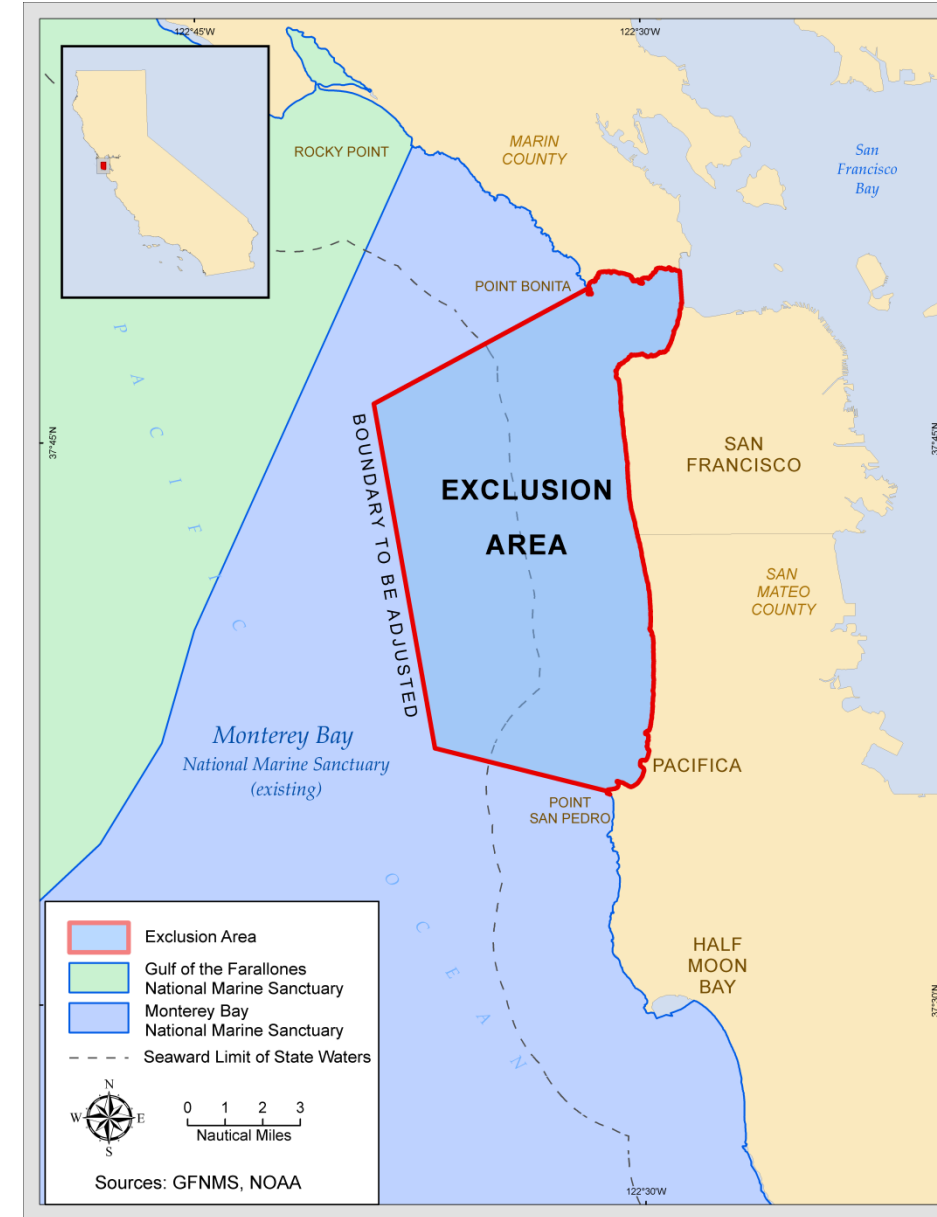


Analyzing a proposed expansion of Monterey Bay National Marine Sanctuary

Carey Batha, Jenna Driscoll, Emma Freeman, Cameron Gray, Hugo Hoffman, Sarah Pierce

Advisor: James Frew Client: Gulf of the Farallones National Marine Sanctuary

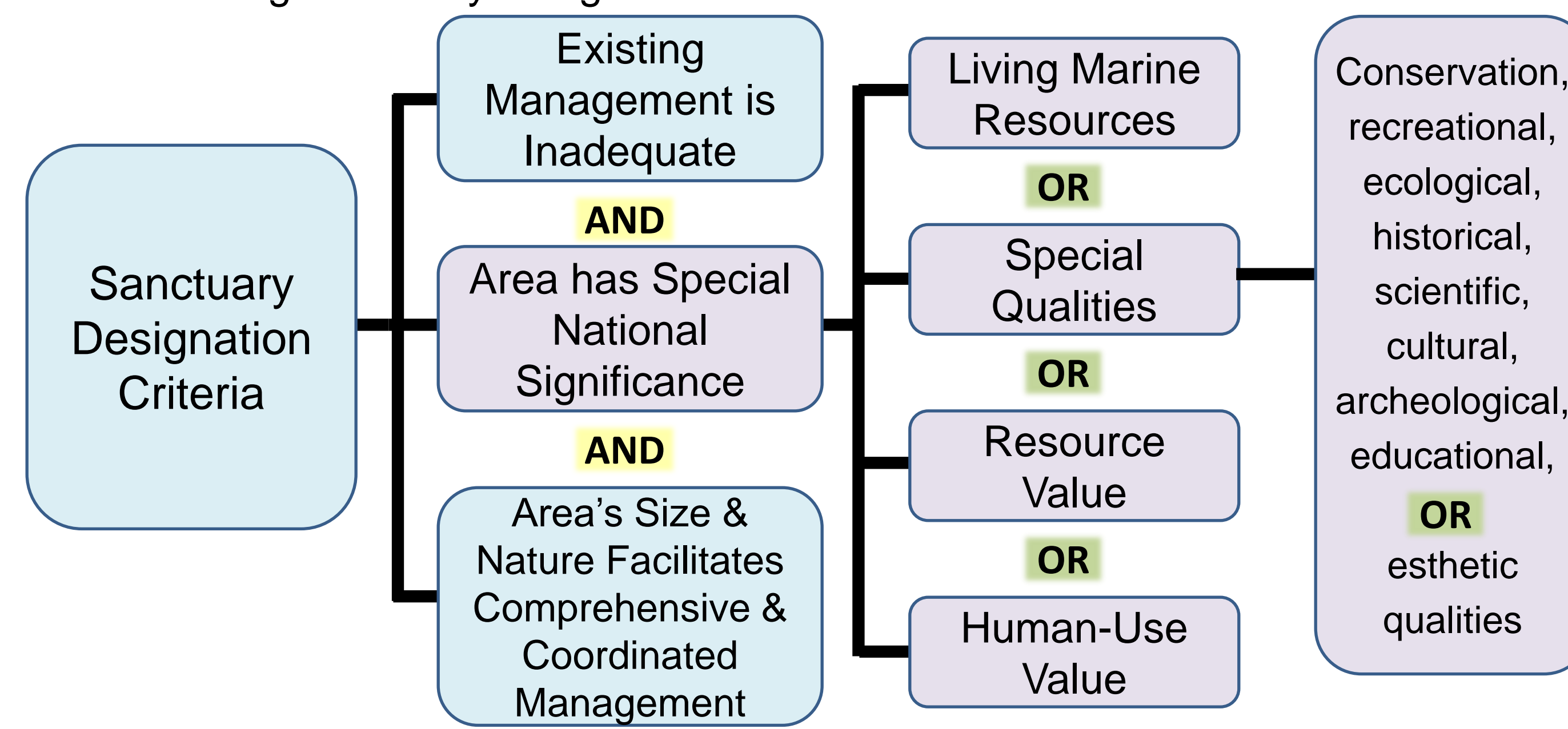
The Problem



When Monterey Bay National Marine Sanctuary (MBNMS) was designated in 1992, a 101-square-mile area was omitted from the northern region of the Sanctuary. Gulf of the Farallones National Marine Sanctuary (GFNMS) manages this region of MBNMS. In September 2012, GFNMS issued a Notice of Intent to begin the legal process necessary to expand MBNMS into the Exclusion Area. This project offers an impartial scientific analysis of the Exclusion Area's suitability for sanctuary status.

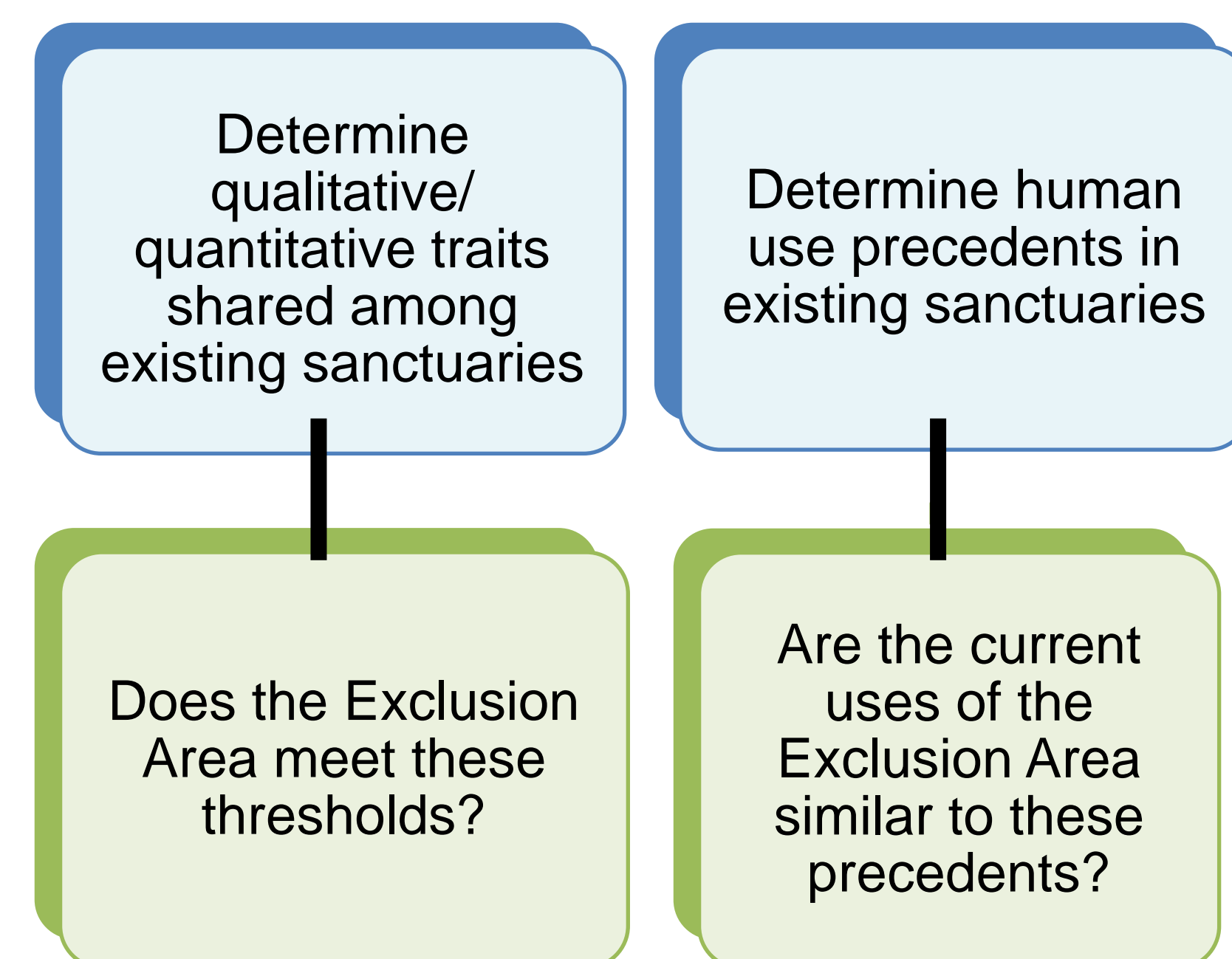
The National Marine Sanctuaries Act

In order for the Exclusion Area to legally receive sanctuary status, it must satisfy the following sanctuary designation criteria:



Operationalizing "National Significance"

Since "special national significance" is subjective, we operationalized the phrase by reviewing the characteristics of the 13 existing sanctuaries. We identified qualitative and quantitative criteria that have emerged over time as thresholds for sanctuary status, and used them as a framework against which to evaluate the Exclusion Area. We also determined what levels of human activities are common in existing sanctuaries.



We compared the Exclusion Area's characteristics to these "emergent sanctuary criteria" to reveal how well the Exclusion Area meets the standards set by the past interpretation of the NMSA.

Is the Exclusion Area Nationally Significant?

OR statements in the National Marine Sanctuaries Act means the Exclusion Area only needs to meet one of these criteria to be considered "nationally significant"

	Emergent Criteria
Ecological Significance	<ul style="list-style-type: none"> ✓ Seasonal upwelling and high productivity ✓ Habitat and feeding grounds for a significant number of marine mammals and seabirds (some threatened or endangered) ✓ High abundance of fish X Confluence of major biogeographic regions, or unique topographic feature X Unusually high habitat diversity X Exceptionally high diversity of benthic organisms
Educational Significance	<ul style="list-style-type: none"> ✓ Educational facilities currently have programs in this area
Scientific Significance	<ul style="list-style-type: none"> ✓ Current research projects conducted in the area ✓ Major research facilities nearby ✓ High research potential X No major research facilities in the area
Human Use Significance	<ul style="list-style-type: none"> X Fishing in the area contributes a small amount to regional catch
Recreational Significance	<ul style="list-style-type: none"> ✓ More than nine recreational uses ✓ More than two pre-existing recreation areas ✓ Recreational fishing exists ✓ Human activity intensity increasing ✓ Accessible to an urban population
Historical, Cultural, & Archaeological Significance	<ul style="list-style-type: none"> ✓ Contains historical resources
Adequacy of Existing Management	<ul style="list-style-type: none"> ✓ Many agencies dedicated to individual characteristics, but overall comprehensive management is inadequate and requires coordination ✓ Two existing government recognitions of the value of the area
Area's Size and Nature Requirement	<ul style="list-style-type: none"> ✓ Smaller than other sanctuaries and other expansions ✓ Adjacent to three existing sanctuaries ✓ Would remove gap in management

What About the Original Reasons for Exclusion?

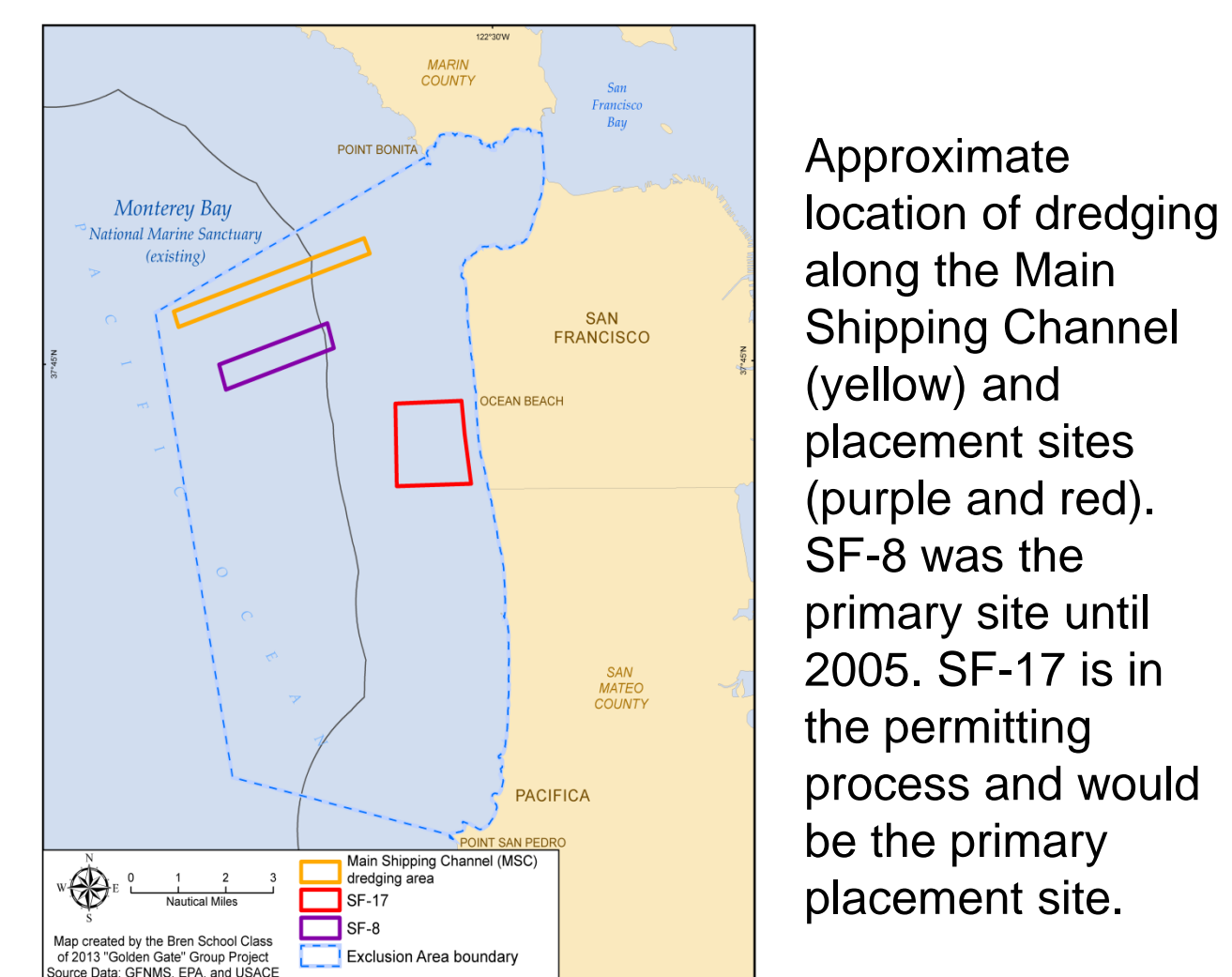
Dredging

Occurs at similar levels in other sanctuaries

Negligible pollutant loading of material

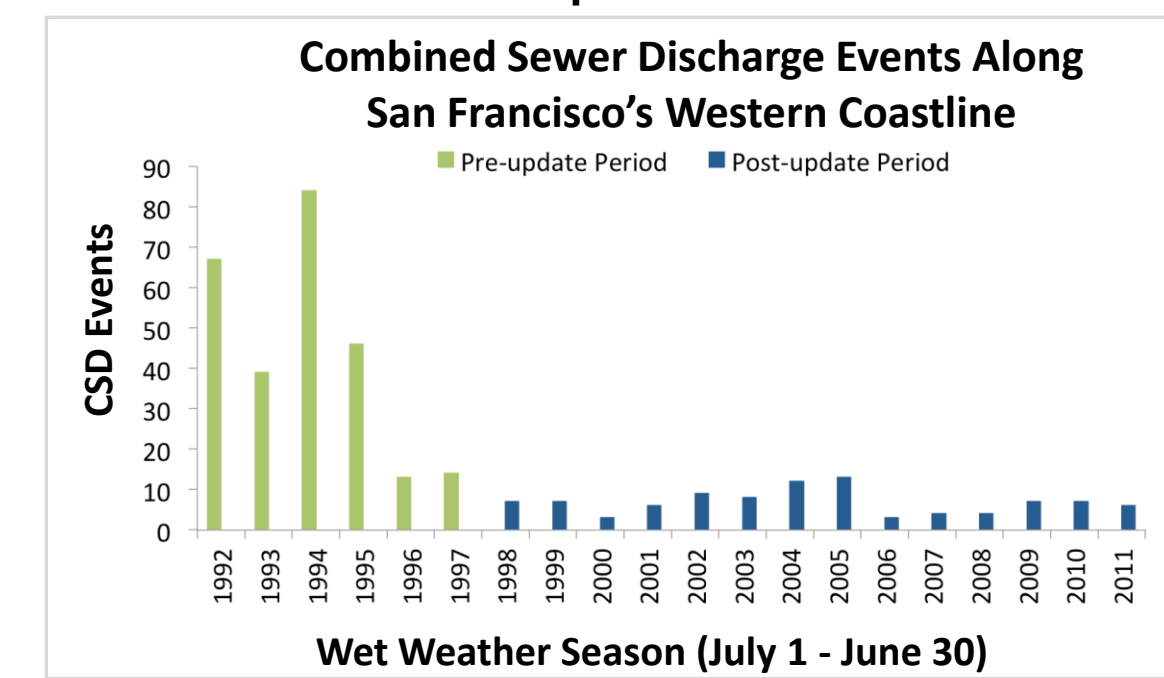
- High grain size
- Low total organic carbon

Placement may be classified as beneficial reuse



Wastewater

Combined sewer discharge events decreased, coinciding with infrastructure updates



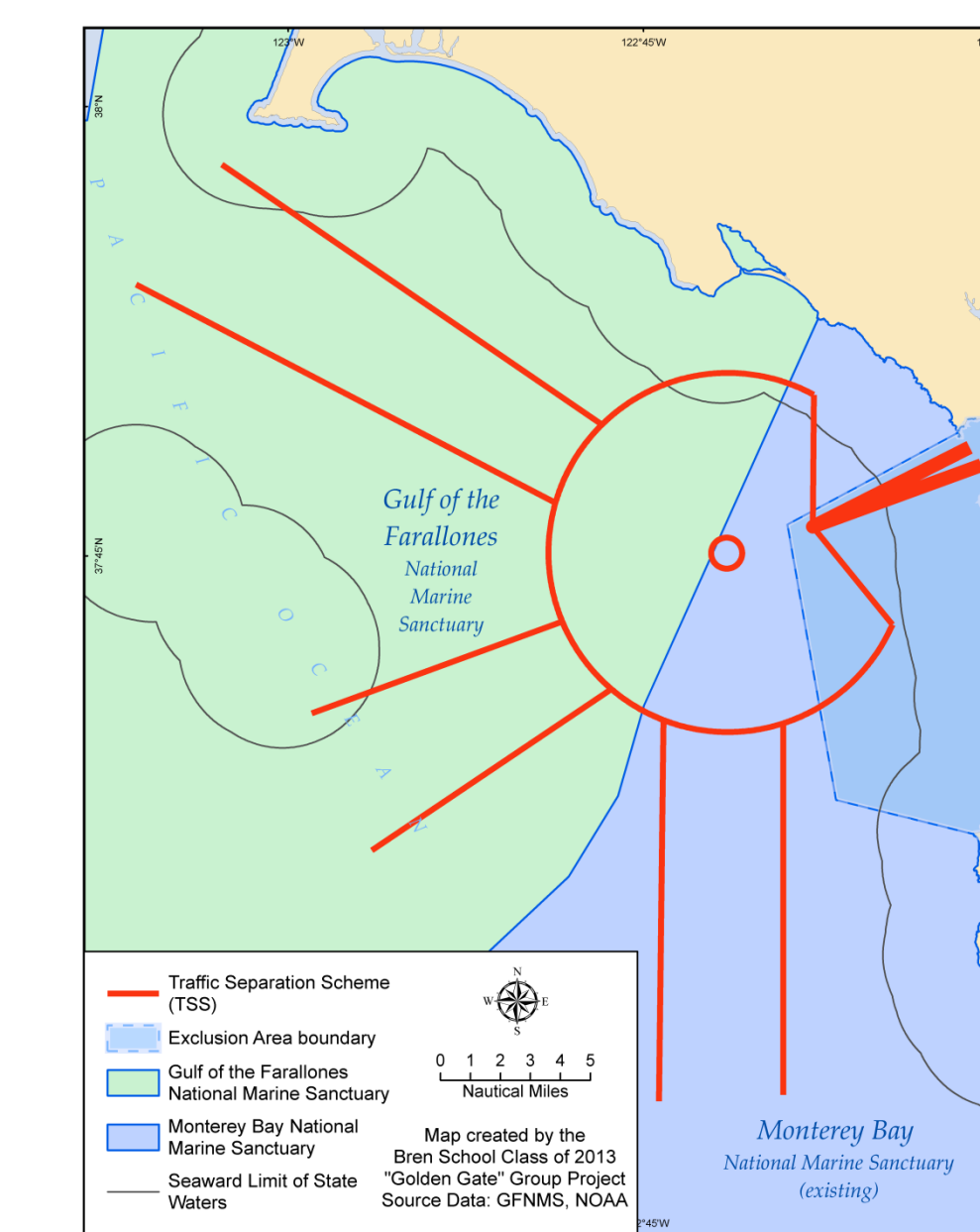
Number of indicator bacteria tests above state limits decreased

Indicator	Difference (Post-Pre)	Increase/Decrease	Statistically Significant	Confidence Level
Total Coliform	-0.012	Decrease	Yes	> 99%
E.coli	-0.010	Decrease	Yes	99%
Enterococcus	0.016	Increase	Yes	95%

No significant negative impacts to sediment quality or benthic and demersal communities

Vessel Traffic

Occurs at similar levels in other sanctuaries

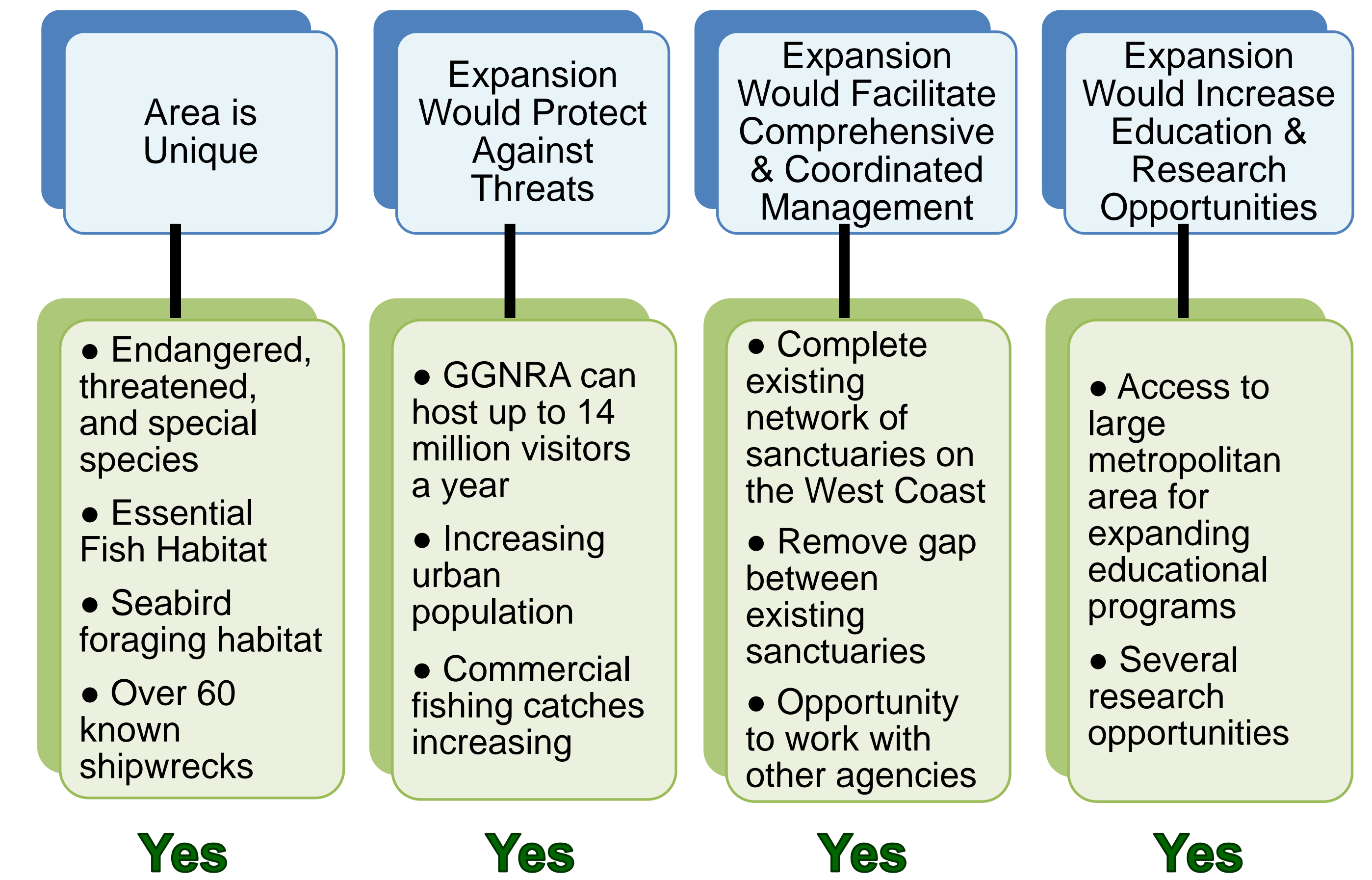


Traffic separation scheme for San Francisco Bay. All vessels traveling in or out of the Bay must follow one of the three routes shown in red. The thicker red lines represent the Main Shipping Channel. It receives an average of 7,390 vessel transits each year. Source: NOAA

Conclusion: Not current barriers to expansion

Is this Similar to Previous Expansions?

There have been five previous sanctuary expansions. We reviewed the Environmental Impact Statements for these expansions and identified four primary justifications for expansion. We then evaluated whether characteristics of the Exclusion Area fulfill these criteria.



Conclusions

The Exclusion Area should be incorporated into MBNMS

Our results indicate that:

- Wastewater discharge, dredging activities, and vessel traffic do not constitute barriers to the proposed sanctuary expansion.
- The Exclusion Area fulfills a compelling number of the emergent sanctuary designation criteria, and thus it fulfills the requirements listed in the National Marine Sanctuaries Act.
- The proposed expansion is comparable to previous sanctuary expansions.

Based on these findings, we conclude that the proposed sanctuary expansion should occur.

We recommend that the Sanctuary coordinate with local agencies to manage the many human uses of the Area.

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