# APPLICATIONS

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## Habitat Priority Planner → Benthic Habitat Connectivity

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### Introduction

Connectivity between coral, seagrass, and mangrove habitats is very important to fish diversity. Fish use different habitats at various points of their life cycle, so when protecting marine areas, habitat diversity and connectivity are crucial to faunal diversity.

This document illustrates a spatial approach to identify areas off the coast of St. Thomas, U.S. Virgin Islands, with strong connectivity between seagrass, mangrove, and coral reef for maximum fish diversity. The information and table below show the process steps needed to conduct spatial analysis using the Habitat Priority Planner for the objectives described. Developing a clearly defined goal and objectives helps *spatial analysis* run more smoothly and ensures that the appropriate *datasets* are identified.

### Goal

Identify seagrass areas with strong connectivity to mangrove and coral reef habitats in the U.S. Virgin Islands.

### Objectives

- Identify patches of seagrass habitat that are large with less edge.
- Identify seagrass patches close to coral reef.
- Identify seagrass patches close to mangrove.

### Spatial Analysis Steps Using the Habitat Priority Planner

1. Use the Habitat Classification module to run a Grouped Classification on the base dataset, Benthic Habitats. Create three customized groups to visually simplify the marine ecosystem: Seagrass, Mangrove, and Coral Reef.
2. Use the Habitat Priority Planner's Habitat Analysis module to run a series of analyses that will help identify key habitat areas that fit the criteria:
    - Perimeter to Area Ratio
        - Seagrass patches that are larger and have less edge
    - Distance To
        - Distance between Seagrass and Coral Reef patches
        - Distance between Seagrass and Mangrove patches
3. Use the Data Explorer module to narrow down from all available habitats to those that meet the specific criteria:

- From the classification containing three groups, select Seagrass habitat.
- Select seagrass patches with a perimeter area ratio ranging from 0 to 0.04, which identifies larger patches with less edge.
- Select seagrass patches within 100 meters of coral reef, an ideal distance for fish movement between the two habitats.
- Select seagrass patches within 750 meters of mangrove, an ideal distance for fish movement between the two habitats.

| Describe Objectives | Data | Analysis (HPP Module 1 & 2) | Selection Criteria (HPP Module 3) |
|---|---|---|---|
| Identify important benthic habitats on the eastern end of St. Thomas, U.S. Virgin Islands | Benthic Habitats | Grouped Classification: Seagrass, Coral, Mangrove | Seagrass |
| Identify larger seagrass habitats with less edge | Seagrass | Perimeter to Area Ratio (meters/hectares) | 0-0.04 |
| Identify seagrass close to coral reef | Coral Reef | Distance to Coral Reef | 0-100 m |
| Identify seagrass close to mangrove | Mangrove | Distance to Mangrove | 0-750 m |

## Results

Of the original 1,230 acres, the final output from the Habitat Priority Planner identifies 670 acres of seagrass that has ideal connectivity to coral reef and mangrove, promoting greater fish diversity.