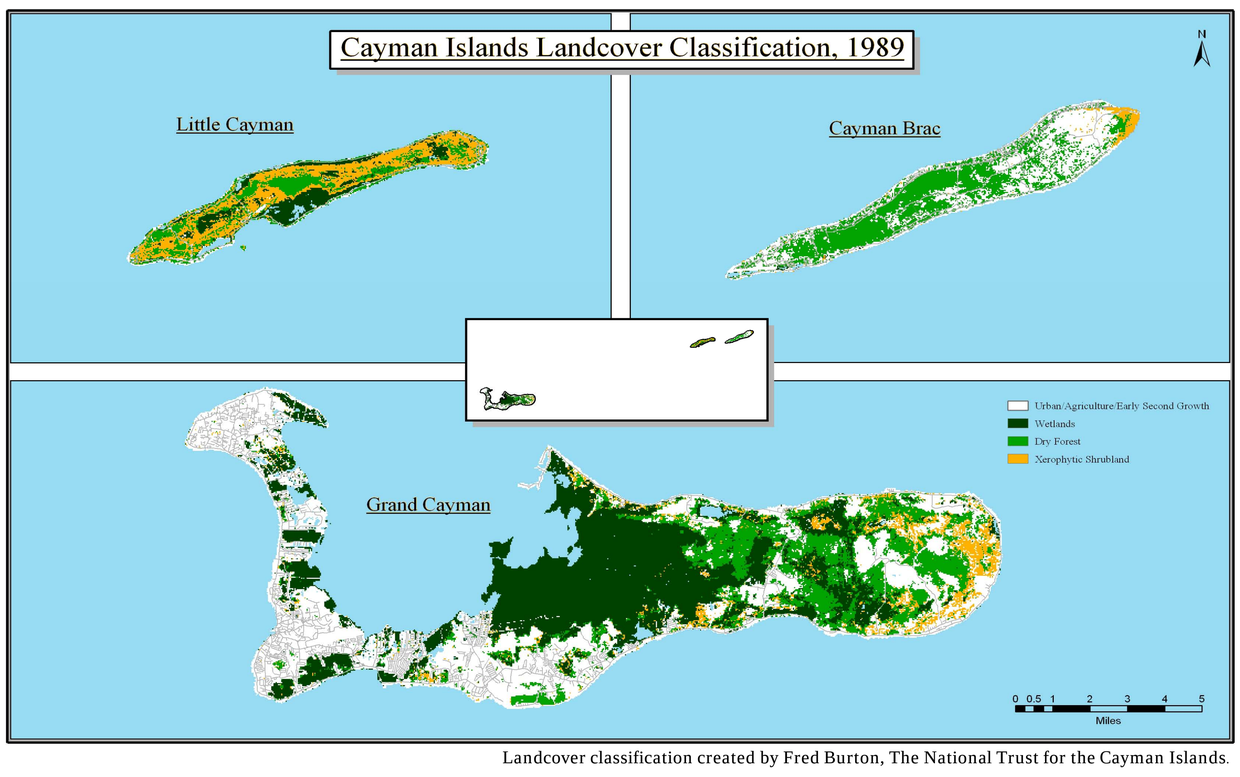
Main Objectives of the Habitat Mapping Portion of the *Darwin Initiative*

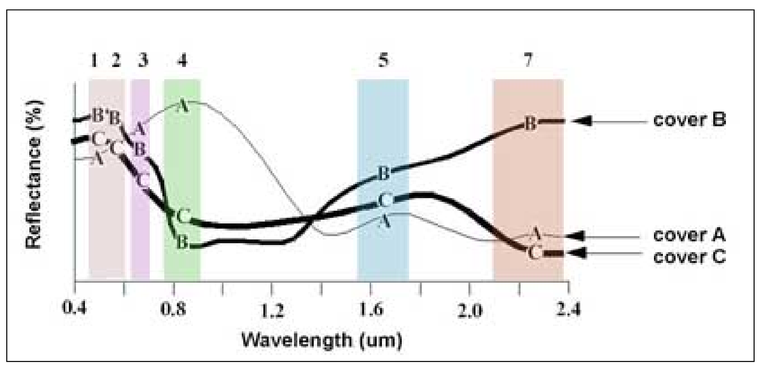


Landcover classification created by Fred Burton, The National Trust for the Cayman Islands.

Update and Expand Existing Landcover Classification

A landcover classification is a visual description of the type vegetation or ground cover in an area. Different types of ground cover (water, urban area, dry forest) have a unique 'spectral signature'. A spectral signature is the way a land cover reflects and absorbs light. The colors recorded by the satellite can be manipulated to get the combination of wavelengths that best distinguishes the spectral signature of the target land cover. A series of test sites are used where pictures are taken and data recorded for known cover types and these are applied to the satellite image to assist in the classification process.

This information will be used to in conjuction with the Biodiversity Action Plan to establish practical habitat protection and management.



Various cover types give unique spectral signatures across the light spectrum. In the above example, wavelengths are chosen where separation between the lines is maximized.

Accurately Map Marine Benthic Habitat

Benthic habitat mapping can be used to accomplish a variety of resource management goals. Habitat and resources change over time can be monitored through benthic habitat mapping. It is also useful in determining the effects of habitat change due to natural or human impacts, such as hurricanes or dredging. Further, resource mapping is a critical component in identifying commercially and ecologically important areas for protection. Mapping of benthic resources for resource management is conducted to accomplish one or more goals including the following:

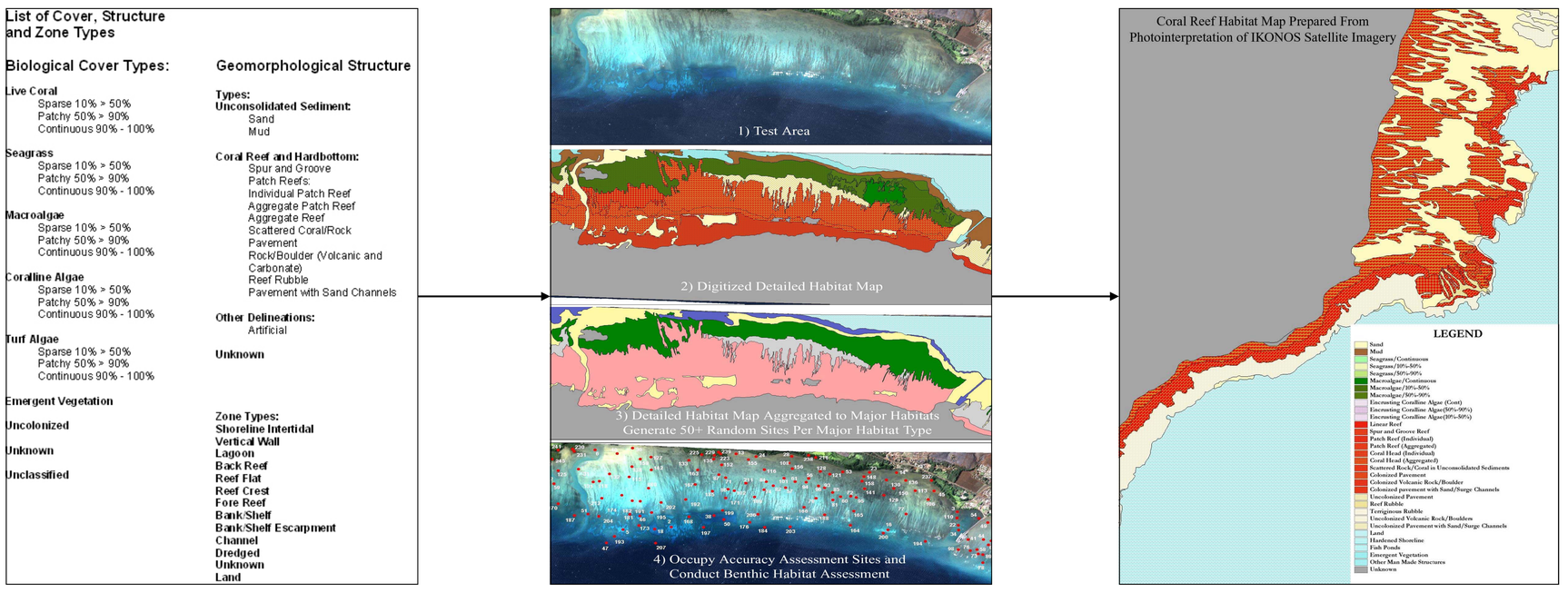
. Establish baseline conditions for comparison with past or future conditions — based on changes from natural or human related effects;
. Develop and document engineering plans and determine construction-related impacts and mitigation for estuarine habitats (creation, restoration, and enhancement projects);
. Document the success of mitigation actions and compensation required due to project impacts;
. Document the need for management intervention

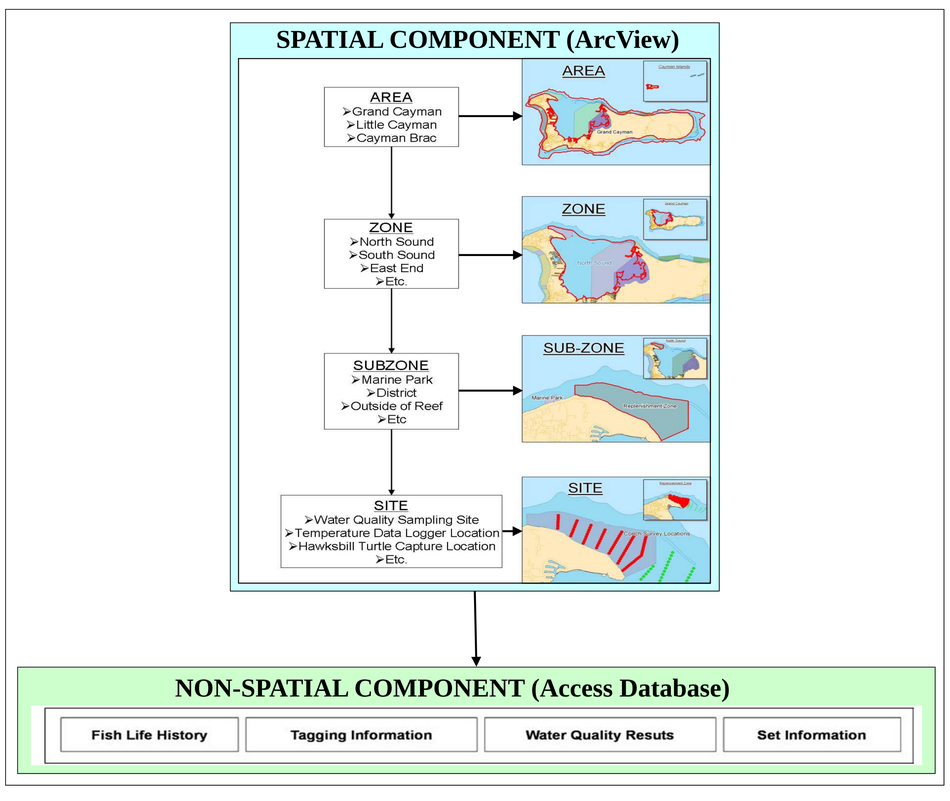
Steps To Be Taken

First: A detailed list of the desired cover, structure, and zone types is documented. This step requires that the level of accuracy that needed be determined. It is less costly and time-consuming to map the benthic resources by major habitat type, although detail of these habitats is often needed to make decisions.

Second: High resolution imagery is needed in order to accurately determine habitat extents. Random field verification sites are established and visited in order to document accuracy of initial delineations using imagery. An accuracy can be measured and is necessary in order to compare results over time or with other similar projects being conducted around the world.

Third: A visual interpretation is produced in map form for quick reference.





Spatial data provided by the Land Information System, Cayman Islands Government, Department of Lands and Survey

Create a Spatial Relational Database Management System (RDBMS)

The database houses all data covering all aspects of the project in one central location. It allows for the storage, retrieval, and viewing of all data quickly and efficiently. Spatial data such as locations for field studies, aerial photography, bathymetric models, and environmentally protected areas are stored in a Geographic Information System software (ArcView). Non-spatial data such as tag information of turtles, conch lip sizes, and species lists are stored in a relational database (Microsoft Access). Some major advantages of this system are:

. Non-spatial data can be added to a map and viewed (ie. When all turtle locations are highlighted, their corresponding tag, length, weight, etc. can be viewed as well)
. The relationships between different datasets can be viewed (ie. Bathymetry, substrate, species locations, and habitat information can be combined to understand habitat requirements)
. Outside users can be supplied accurate data in a timely manner and in a widely recognized format and comparisons can be drawn to other locations
. Biodiversity management decisions are assisted greatly by having all relevant information on hand in one central location

Determine Effects of Hurricane Ivan

Pre and Post Ivan maps can be used to draw conclusions on the effects of this devastating natural disaster. Hurricane Ivan has seriously modified the vegetation and the full extent of this will be clearly defined. Potentially positive impacts of the hurricane included the toppling of many non-native Casuarina (Casuarina equisentifolia) trees along the coast of Grand Cayman, presenting an opportunity for recovery planting of denuded areas with native species such as Sea Grape (Coccoloba uvifera) before recolonising invasives take hold.