

Ecosystems Valuation The Bahamas Experience

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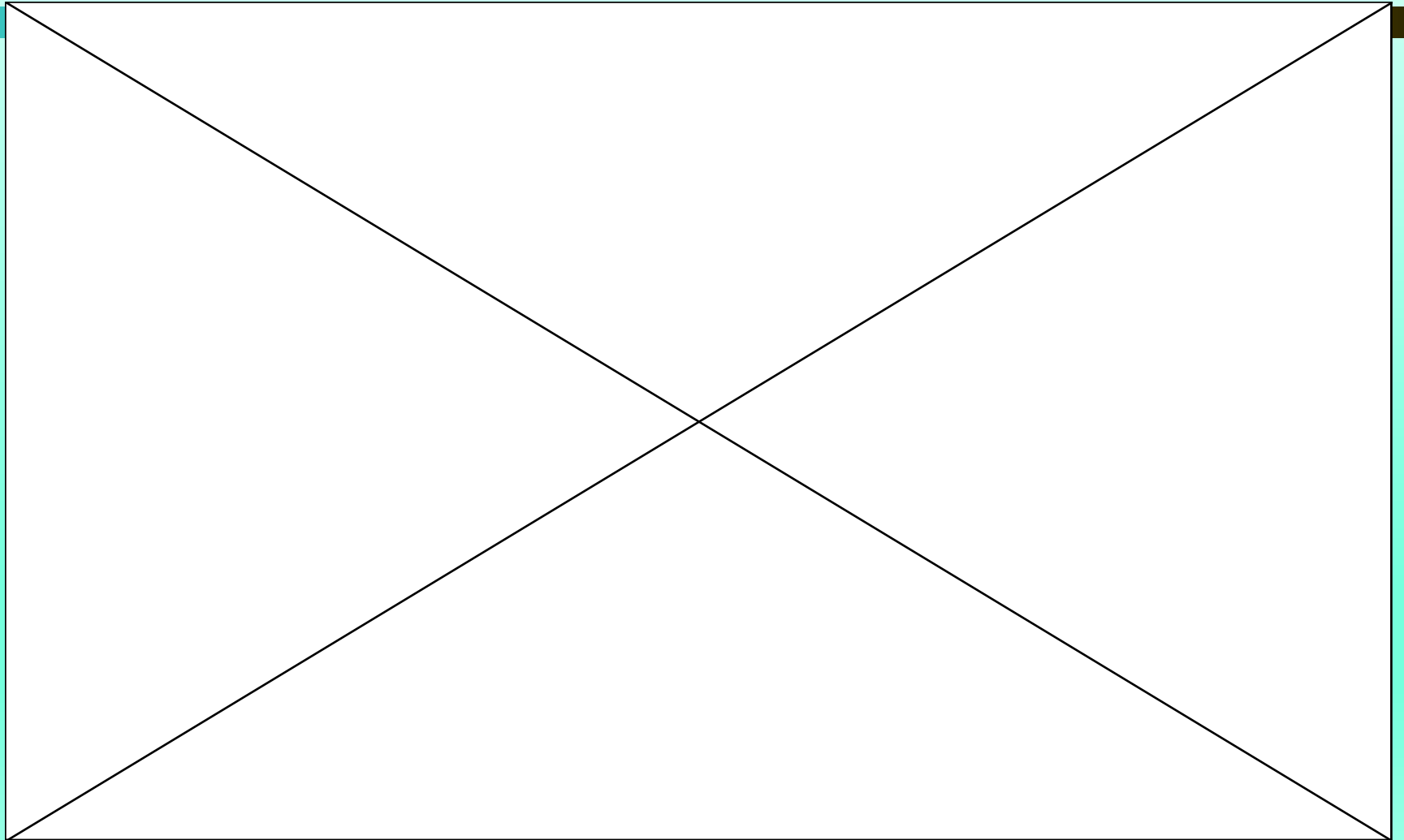
The Bahamas Environment, Science & Technology
(BEST) Commission



The Commonwealth of the Bahamas



Its Better in The Bahamas...



Facts about The Bahamas

- ❑ **Population:** 377, 374 People (2013)
- ❑ **Industries:** tourism, banking, cement, oil transshipment, salt, rum, aragonite mining, pharmaceuticals, international shipping & agriculture among others...
- ❑ **Economic summary: GDP/PPP(2013 est.):** \$8.373 billion; per capita \$32,000.
- ❑ **Natural resources:** Salt, Aragonite, Timber, Large fish stocks & Arable lands
- ❑ **Exports:** \$960 million (2013 est.): mineral products and salt, animal products, rum, chemicals, fruit and vegetables.
- ❑ **Major trading partners:** U.S., South Korea, Dominican Republic, India, Singapore, Ecuador, Colombia, China, Canada, Switzerland (2012).



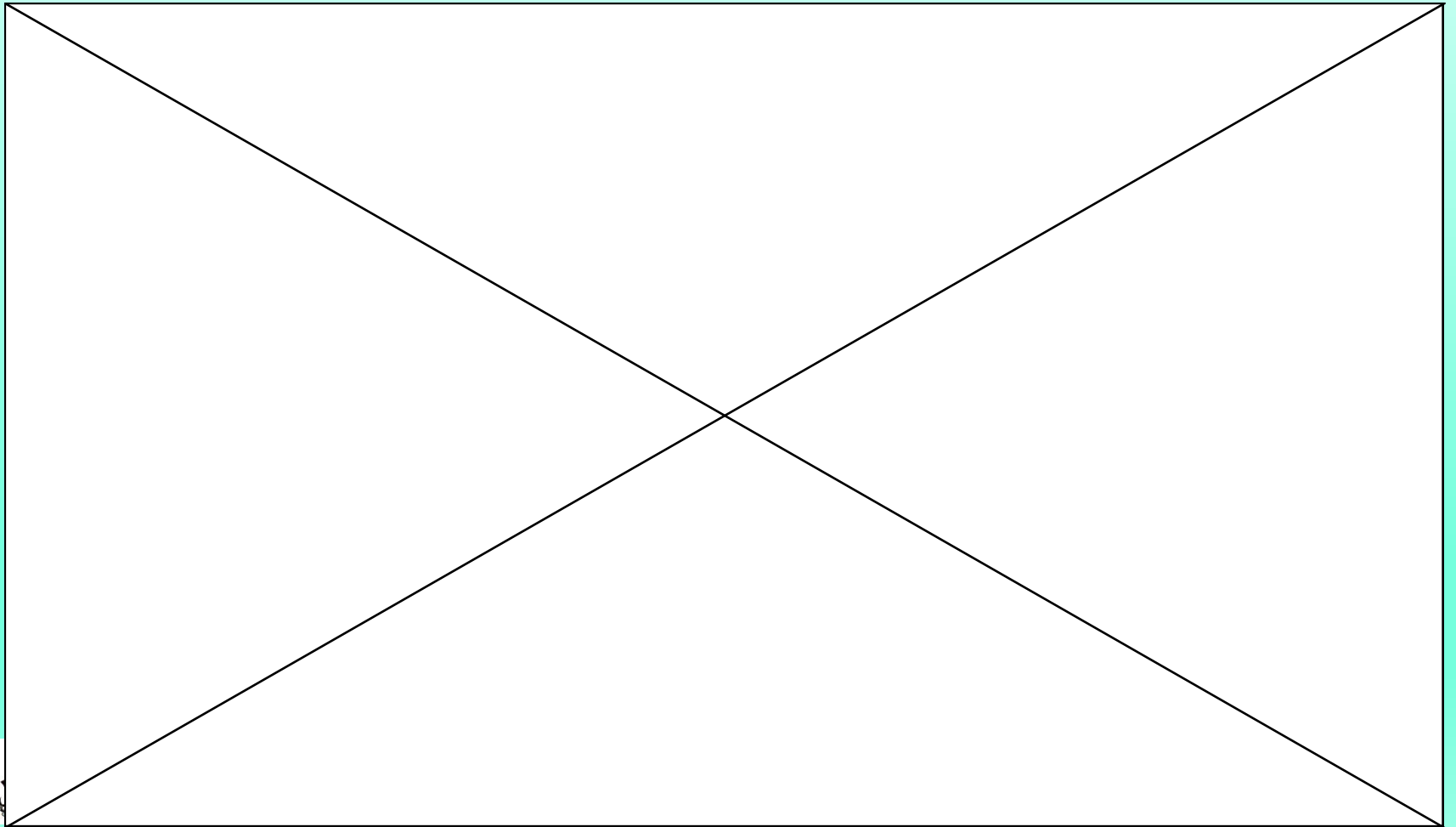
The BIG Picture

- Recognizing the importance of the Bahamian Natural Resources and its linkages to the economy
- Practical Importance of Ecosystem Valuation
- Creation and Expansion of National Parks and Marine Protected Areas and Reserves
- Researching Economic Valuation & Payment for Eco-Services
- Performing Ecological Gap Assessments to determine values of these systems
- Protecting and preserving the Bahamian Natural Environment thru public awareness and educational initiatives.



The Out Islands of The Bahamas...

The “REAL” Bahamas



Bahamas National Parks and Protected Areas

- ❑ 27 National Parks throughout the archipelago
- ❑ Managed by the Bahamas National Trust
- ❑ More than 2million acres of marine and terrestrial sites
- ❑ Additional proposed areas include:
 - 2 sites in Grand Bahama in addition to the 3 already established parks
 - 1 site in San Salvador in addition to the 5 already established parks
 - 1 site at Joulter's Cay, Andros in addition to the 2 already established parks.... among others



Ecosystem Service Valuation of Proposed Protected Areas in Abaco, The Bahamas

Tyler Clavelle and Zach Jylkka

Sustainable Fisheries Group, UC Santa Barbara December 2013

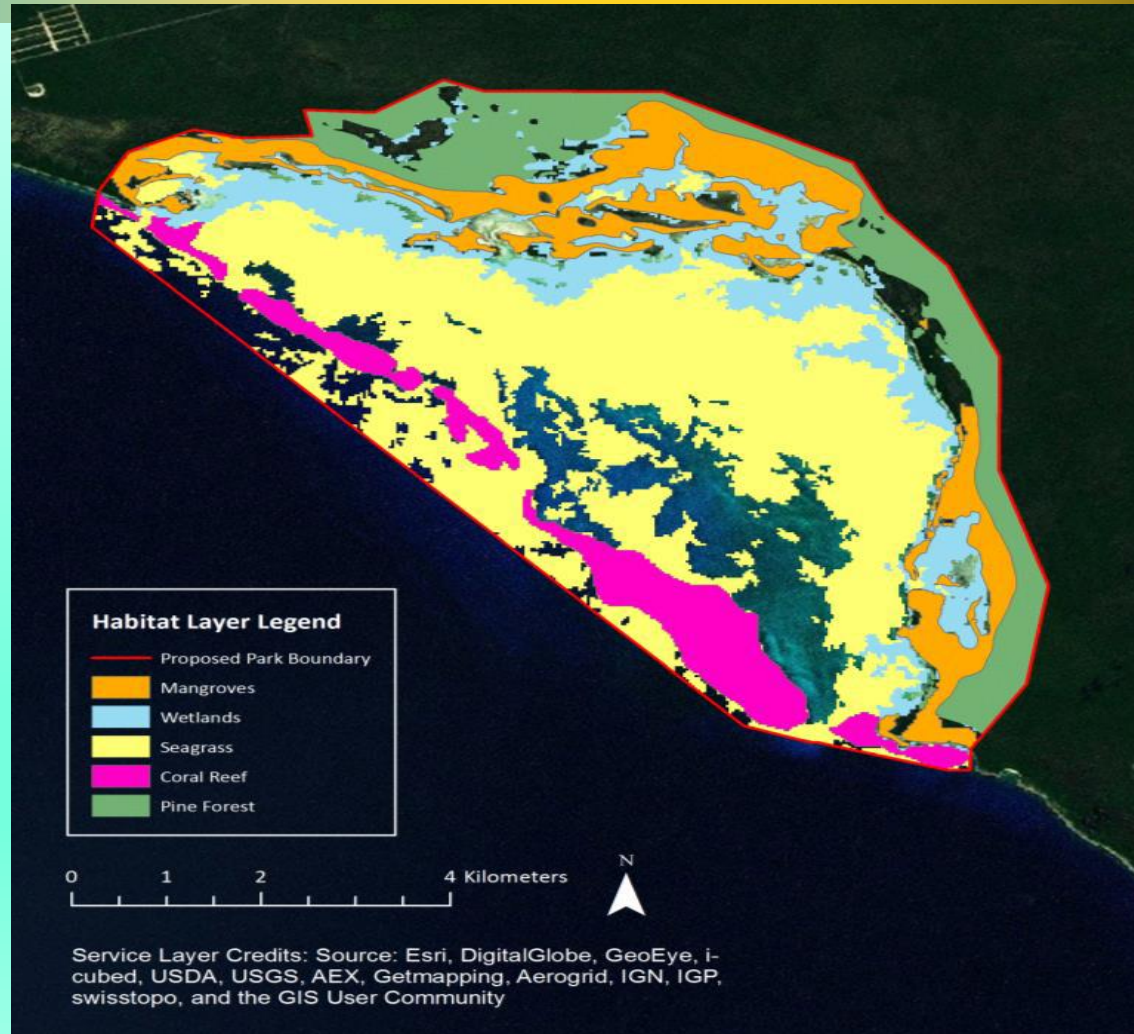


A closer look...

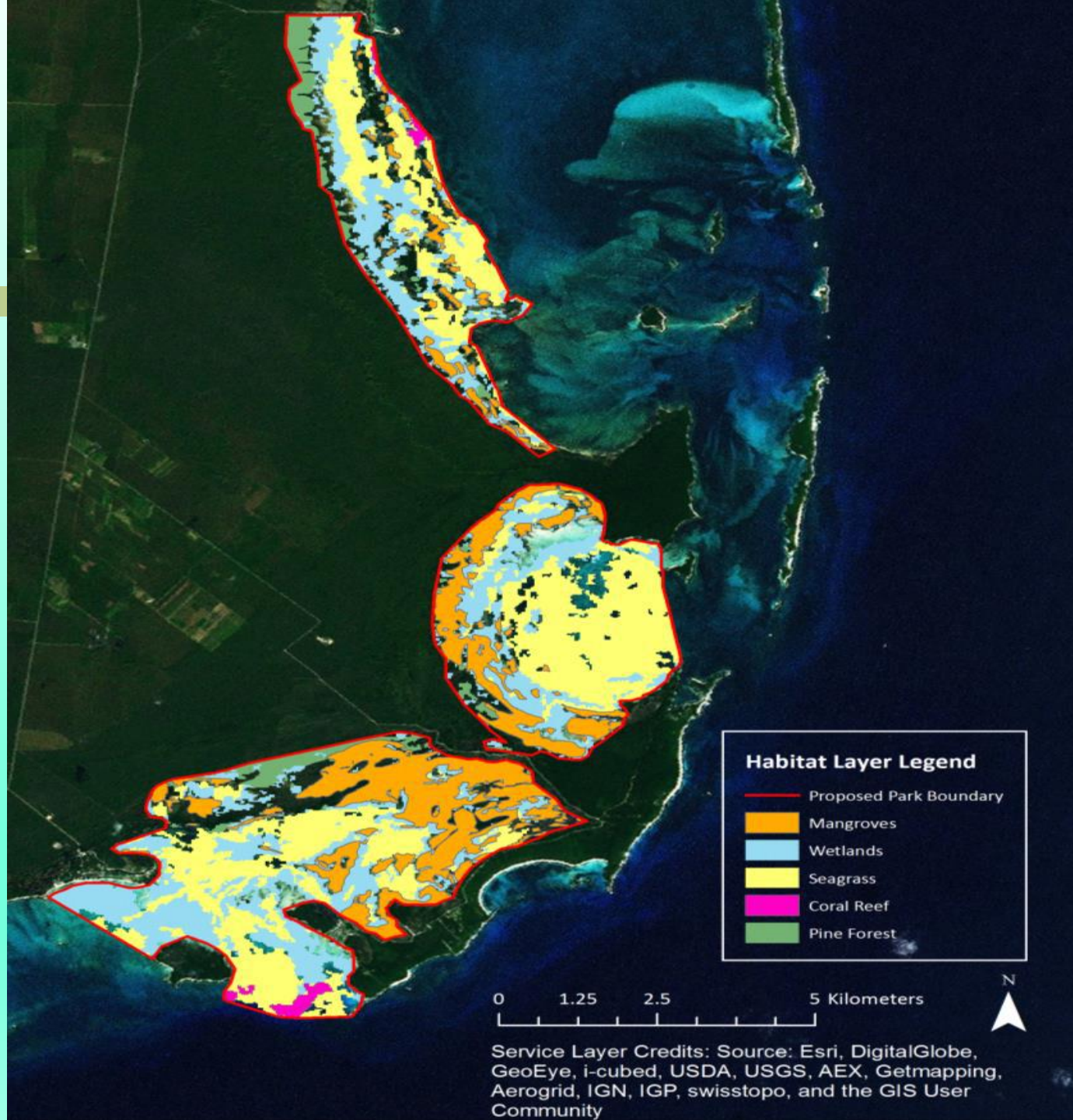


Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Habitat Distribution Map



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Valuation Methodology: Benefit Transfer

The four benefit transfer methods include:

- ❑ Single-point or average value transfer: the most straightforward method, direct value transfer takes a per unit value estimated at a study site and multiplies it by the quantity of that ecosystem service at the policy site
- ❑ Adjusted benefit transfer: prior to transfer, values are adjusted to account for socioeconomic differences between the original study site and the policy site of interest. These adjustments generally account for spatial and temporal differences in income and prices.
- ❑ Value function transfer: this approach takes a function developed from a previous economic valuation (revealed preference, contingent valuation, choice modeling) and parameterizes it to reflect the policy site.
- ❑ Meta-analysis: estimates are produced from a unique value function that accounts for differences in the parameters of multiple primary studies.



Annual Aggregate Values of Cross Harbor and East Abaco Creeks Proposed Protected Areas (2012 Int. \$)



Low Estimates

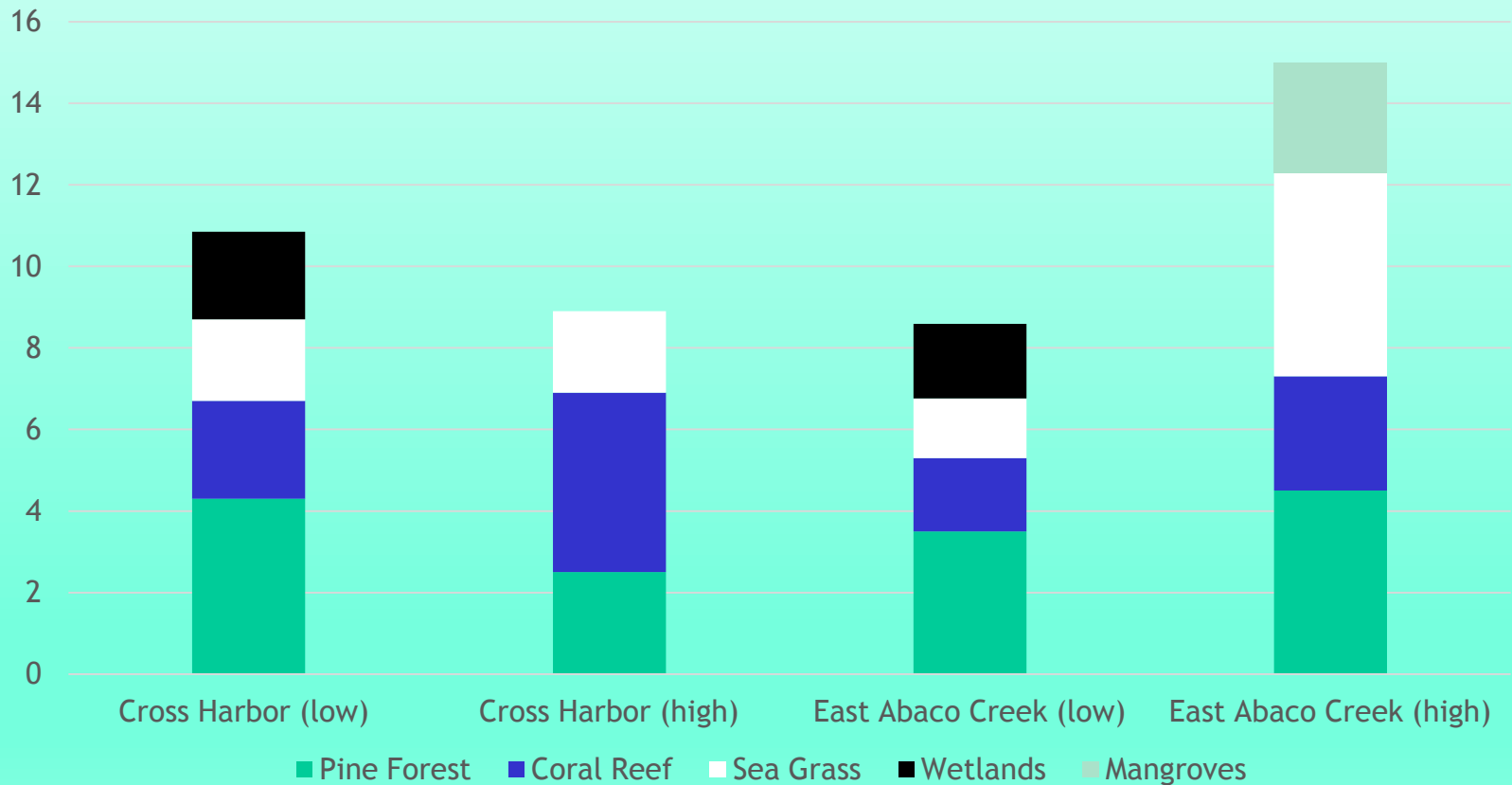
High Estimates

Habitat	Cross Harbour	East Abaco Creeks	Cross Harbour	East Abaco Creeks
Mangroves	\$1,879,000	\$2,770,000	\$1,879,000	\$2,770,000
Wetlands	\$899,300	\$1,831,800	\$1,475,600	\$2,152,000
Seagrass	\$1,720,500	\$1,462,000	\$1,720,600	\$1,462,000
Coral Reef	\$305,300	\$40,500	\$358,300	\$47,600
Pine Forest	\$476,800	\$165,100	\$476,800	\$165,100
TOTAL	\$5,280,900	\$6,269,400	\$5,910,300	\$6,596,700

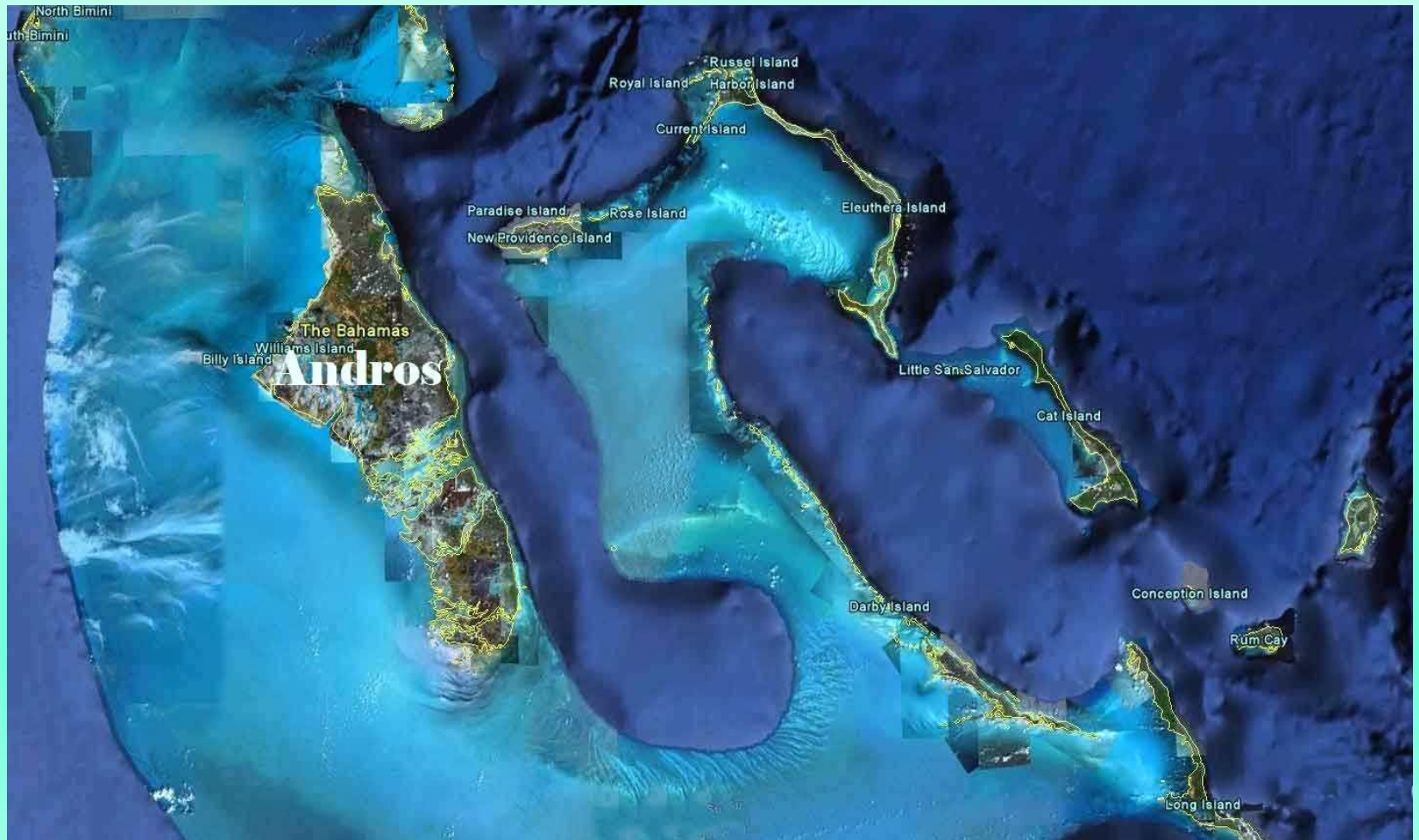
For Cross Harbor, mangrove habitat presents the highest value (\$1.88 million). Wetlands generate the second most value in both scenarios (\$899,300 and \$1.48 million), followed by pine forest and coral reefs.



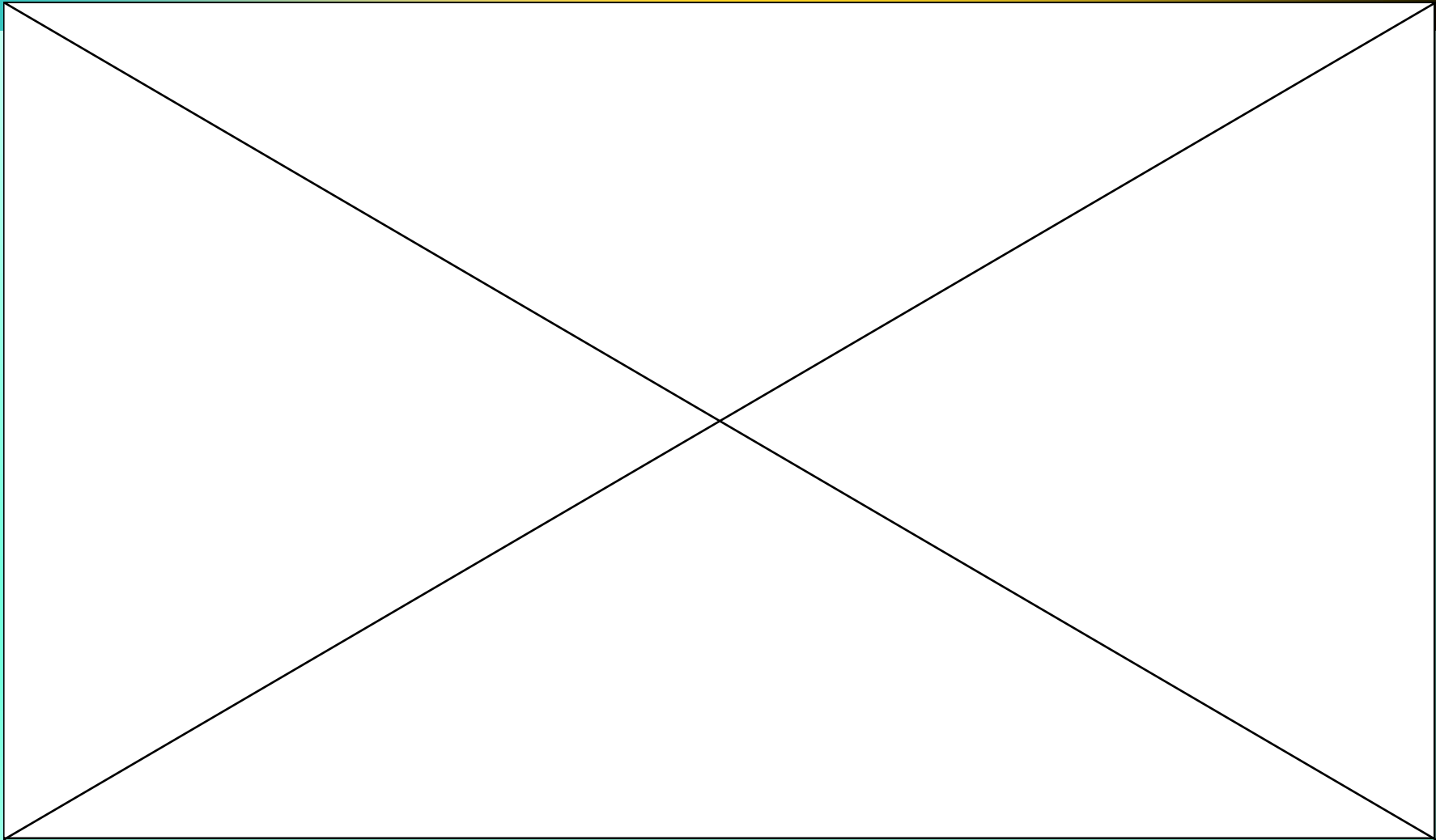
Annual Aggregate Value of Cross Harbor and East Abaco Creeks Proposed Protected Areas



Andros Island, Bahamas

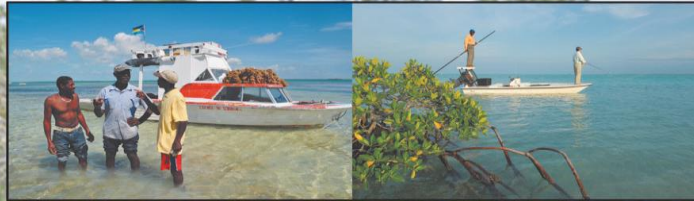


Welcome to the “Big Yard”



IWCAM

An Economic Valuation of Natural Resources on Andros Island



Integrating Watershed and Coastal Areas Management
in Caribbean Small Island Developing States

ANDROS DEMONSTRATION SITE

ECONOMIC VALUATION OF THE NATURAL RESOURCES

Summary Map of Habitat Values

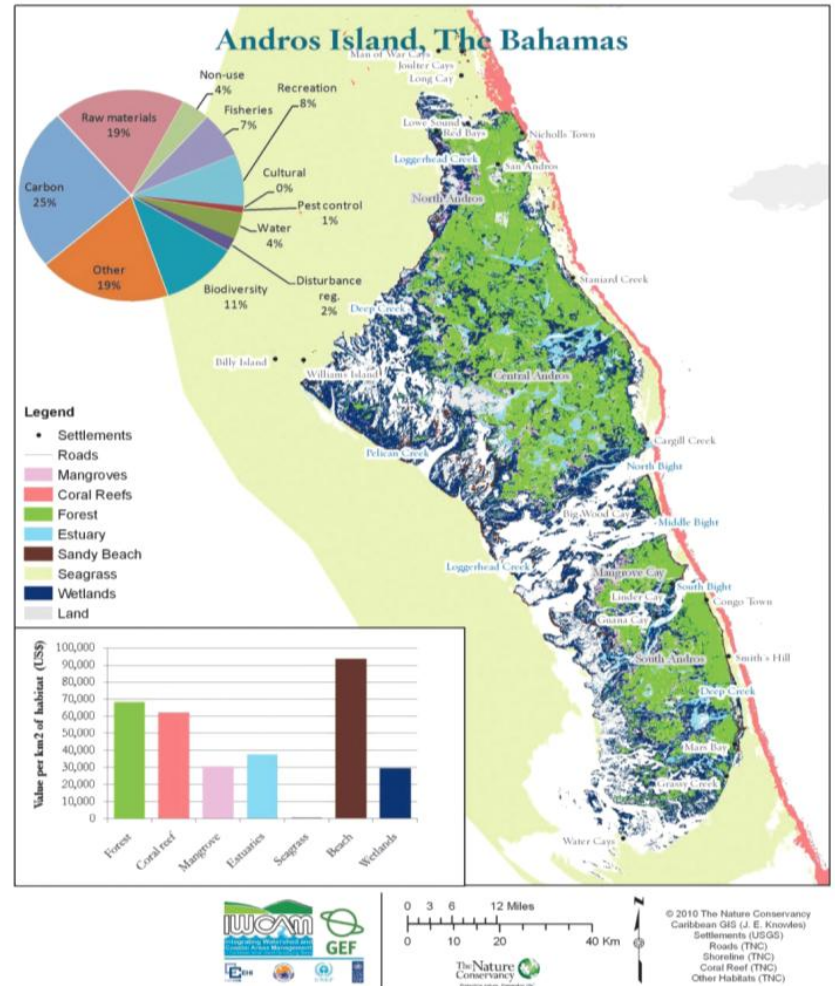


Figure. Summary map of Habitat Economic Values

A6.
A7.
A8.
A9.
A10.
A11.



Summary of Direct Economic Impacts

Type of Activity	Aggregated impact in 2009 (US\$)	Principal income	Secondary income	% of Economic Impact
Fishing	47,265	392	3700	33%
Crabbing	19,687	53	3700	14%
Sponging	3,180	32	275	2%
Farming	1,234	486	28	1%
Crafts	1 8,345	448	17	6%
Water revenues	15,830	31	0	11%
Guided recreational fishing	10,000	18	35	7%
Tourism expenditure	1 32,555	178	176	23%
Eco-trips	1,025	20	60	1%
Education / research	2,800	18	8	2%
TOTAL	\$141.9Million	1676	8000	

The Key messages from the Economic Valuation of the Natural Resources of Andros Island

- ❑ The ecosystems, species and landscapes of Andros represent a huge ecological and economic endowment for the people of Andros, The Bahamas and the wider Caribbean region.
- ❑ The habitats on Andros provide an estimated mean of \$46,000 per km² per year in ecosystem services, such as carbon storage, water supply and recreation.
- ❑ Overall, habitats on Andros are thought to generate \$260 million a year in net economic benefits, which if sustained, will be worth \$4.6 billion over the next 25 years.
- ❑ The net benefit of fresh water on Andros is \$3.5 million each year.
- ❑ Nature provides income and employment for 80% of Andros; 1,645 full time jobs and 8,000 part time jobs.
- ❑ Commercial fisheries in Andros (including crabbing and sponging) generate \$70 million in revenues each year, which provides food and income for many people and households.
- ❑ Nature based tourism activities (including accommodation, bone fishing and diving) constitute \$43.6 million in revenues each year in Andros.
- ❑ Overall, the extractive and non-extractive use of Androsian natural resources generates \$142 million in direct gross economic activity and an additional \$35 million in associated spending, which is at least 60% of all economic activity on Andros. Over the next 25 years, this could add up to \$3 billion in revenues.
- ❑ Environmental degradation in the Caribbean means that natural resources on Andros are likely to become more valuable, if they are properly protected. Conversely, the potential losses in values and the loss in income, jobs and welfare could be enormous, if effective conservation actions are not implemented.
- ❑ In order to establish a basic level of sustainable management of these habitats, initial funding of \$1.62 million is needed, which is equivalent to 0.6% of the economic benefits and 1% of the gross revenues this island's ecosystems produce each year.



The Bahamas...Our Unique Experiences

- ❑ NBSAP- formulated September 1996 and completed in 1999.
- ❑ In 2002 the National Park System of The Bahamas was doubled in size, an unprecedented accomplishment in protected area history.
- ❑ July 1st 2013 an environmental tax was imposed on various items imported into the country. This fee/tax range in amounts from \$1 to \$200 per item. The funds are collected by the Custom Department and placed in an environmental fund.



Cont'd...

- ❑ Economic Valuation needs assessment was conducted January 2008-December 2009
- ❑ In July 2014, the BPAF was legally established with the overall goal to close the critical shortfall in meeting the financial needs of protected areas.. Hence, the general purpose of the Fund is to ensure sustainable financing into perpetuity for the management of Protected Areas including management of activities under the Caribbean Challenge Initiative (CCI) and the objectives of the Caribbean Biodiversity Fund.



“Reality Check”: Why are Valuations Needed???

- ❑ To enhance preserve, conserve and protect the natural environment
- ❑ Create a mechanism for the possibility of more MPAs and reserves being established.
- ❑ To consider the public’s values, and encourage public participation and support for environmental protection.
- ❑ To prioritize conservation or restoration projects.
- ❑ To examine the revenue of the services ecosystems offer
- ❑ To assess the economic value of natural resources so that they are not abused, exploited or devalued.



THANK YOU!!!

