National Protected Areas Policy and Systems Plan

National Protected Areas Analysis

Lead consultant: Jan Meerman

NPAPSP Protected Areas Analysis Consortium:

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NPAPSP Protected Area Analysis

Background:

Belize has a high proportion of its land and sea resources protected under a variety of management structures. This system of Protected Areas has evolved over several decades, reflecting changing conservation attitudes, as has the scope and direction of the various agencies responsible for its administration. However, Belize now finds itself at a crossroads: the system represents a wealth of valuable resources, yet, in the face of calls for additional reserves, how should it be developed, and how should it be integrated more effectively with the national economy?

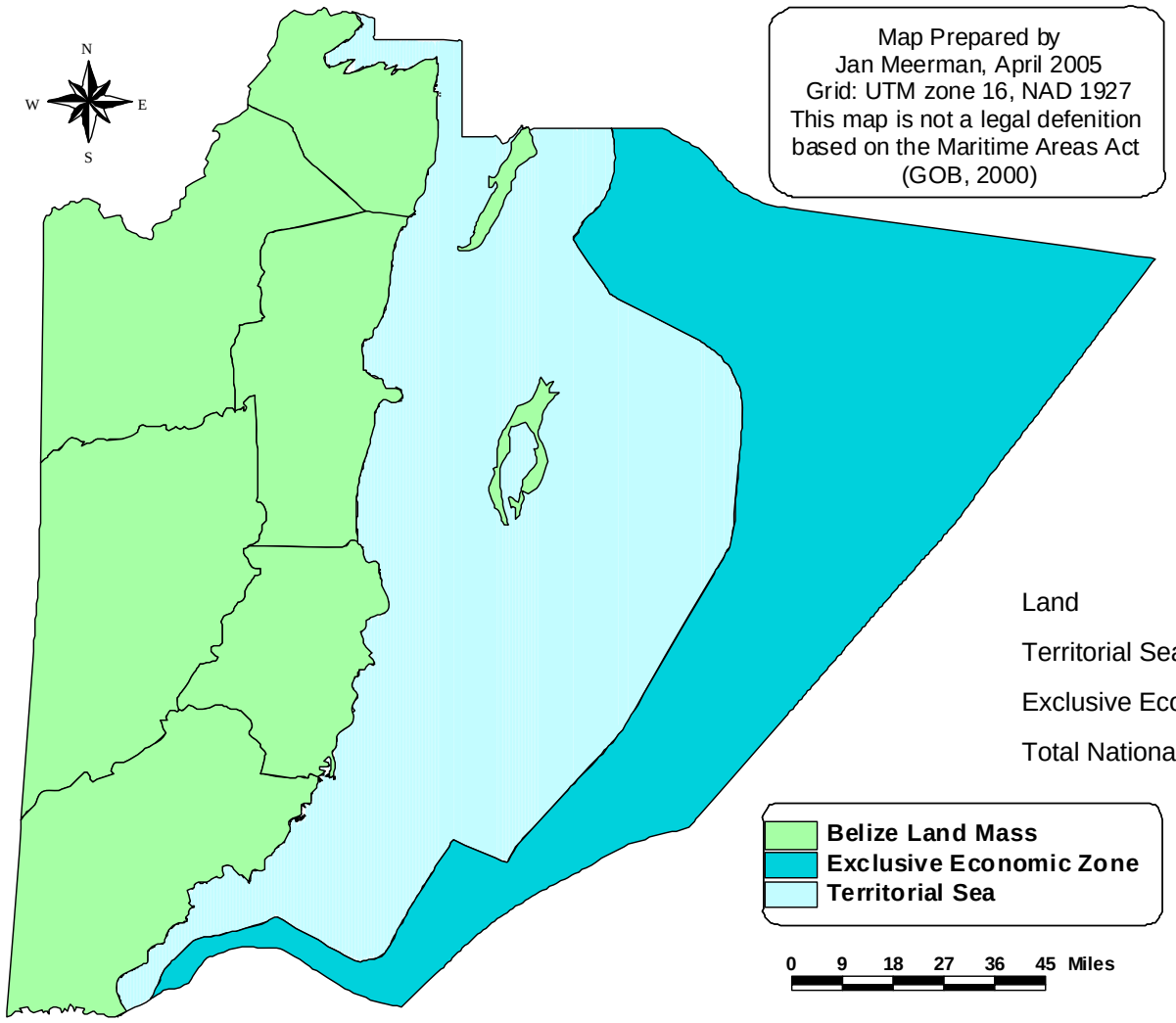
To answer this question, a work plan was developed in 2004 with the guiding principle that the potential contribution of the Protected Areas System to national development and poverty alleviation is to be maximized, thereby putting the system on a sound and rational footing.

NPAPSP Protected Area Analysis

This 2004 work plan called for a Protected Areas System Assessment & Analysis which was defined as:

An assessment of the attributes of Belize's natural resources and the Protected Areas system, including all ecotypes, cultural monuments, critical habitats, watersheds, land suitability, use and ownership, and areas vulnerable to natural or climate-related change. This is assessed in the light of proposals for new and/or consolidated protected areas, and for biological corridors, with regard to identified threats to the system. Through this process, gaps in the system are identified.

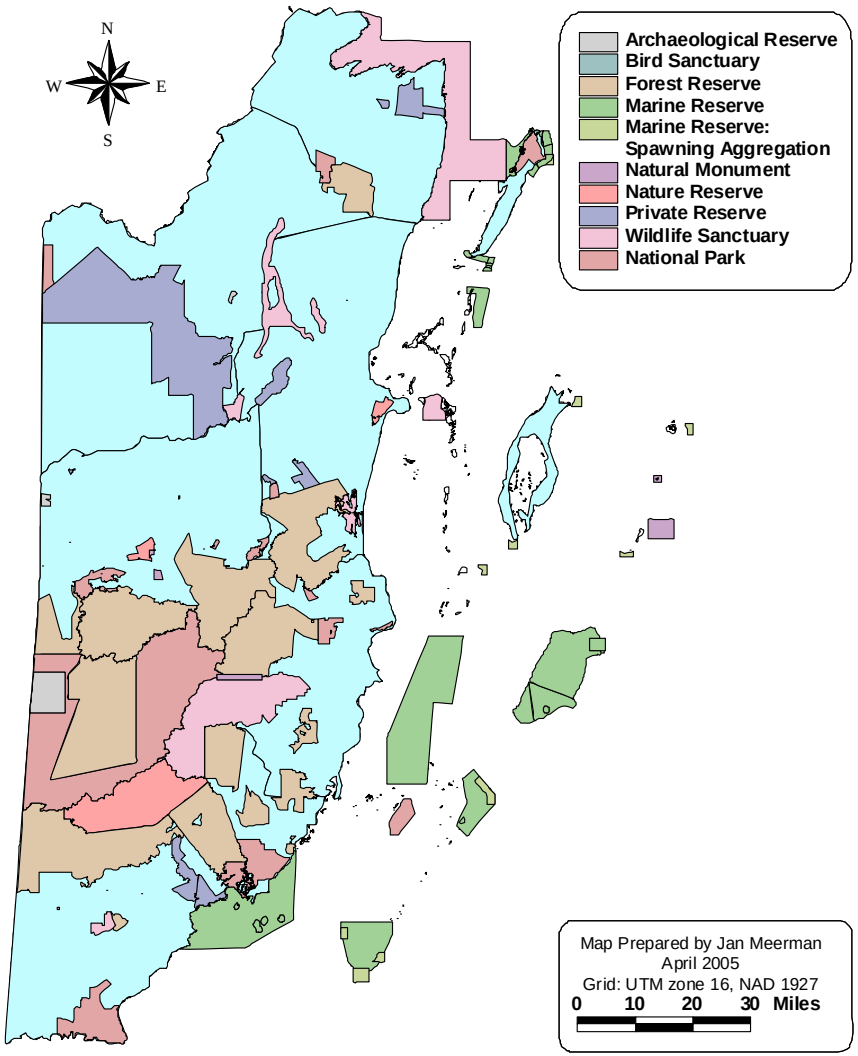
NPAPSP Protected Area Analysis



Much confusion exists about the true amount of protected areas in Belize and the total coverage of these protected areas in comparison with the total territory of Belize.

	Acres	Hectares
Land	5,467,840	2,212,760
Territorial Sea	4,609,230	1,865,300
Exclusive Economic Zone	3,968,190	1,605,880
Total National Territory	14,045,260	5,683,940

NPAPSP Protected Area Analysis



There exist a total of 94 protected areas in Belize (including archaeological reserves and accepted private reserves).

Several of these reserves, particularly in the Marine realm have gazetted management zonation. When these zones are taking into account the number of “management units” increases to 115.

Many of these protected areas are really areas for the management of extractive resources (Forest Reserves and Marine Reserves)

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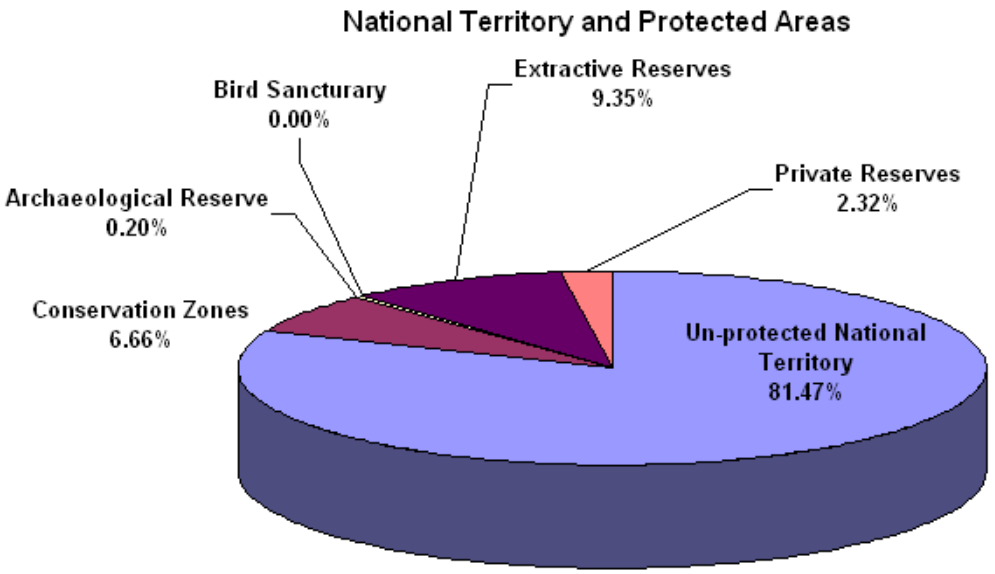
The amount of the national territory under some form of conservation management is 18.5 %.



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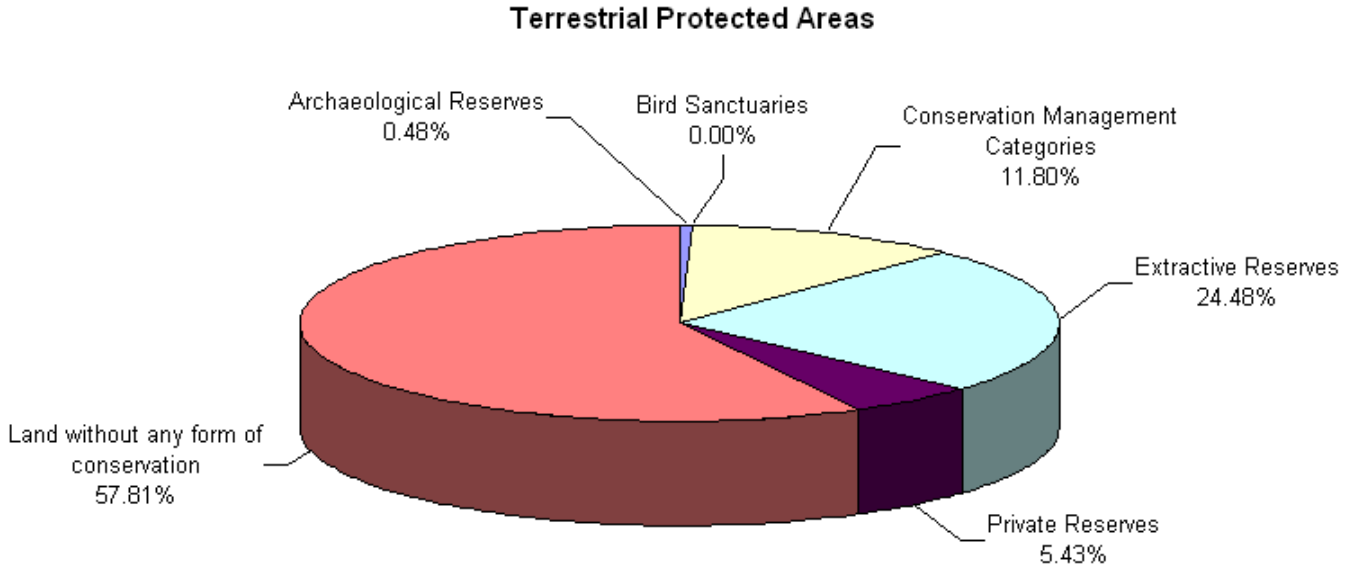
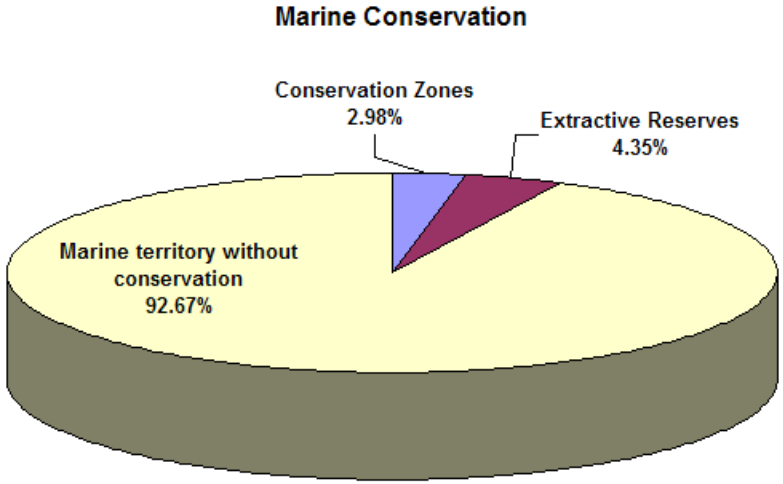


For the terrestrial part the area under conservation is 42.19%. Within the terrestrial protected areas, the extractive reserves form the largest component.

The marine realm, compared with the terrestrial realm is largely un-protected. Only 7.33% is protected and the largest part of that again as extractive reserves.



NPAPSP Protected Area Analysis

To make a first analysis of this existing system of protected areas, a **Site scoring system** including key Protected Areas Systems characteristics was developed. Incorporated characteristics include those of ecological, cultural, social, resource conservation, and economic value including environmental services

The various consortium members conducted the scoring exercise for the 94 protected areas identified here. The prioritization of the Protected Areas system in this way provides a credible way to prioritize resource allocation, both human and financial.

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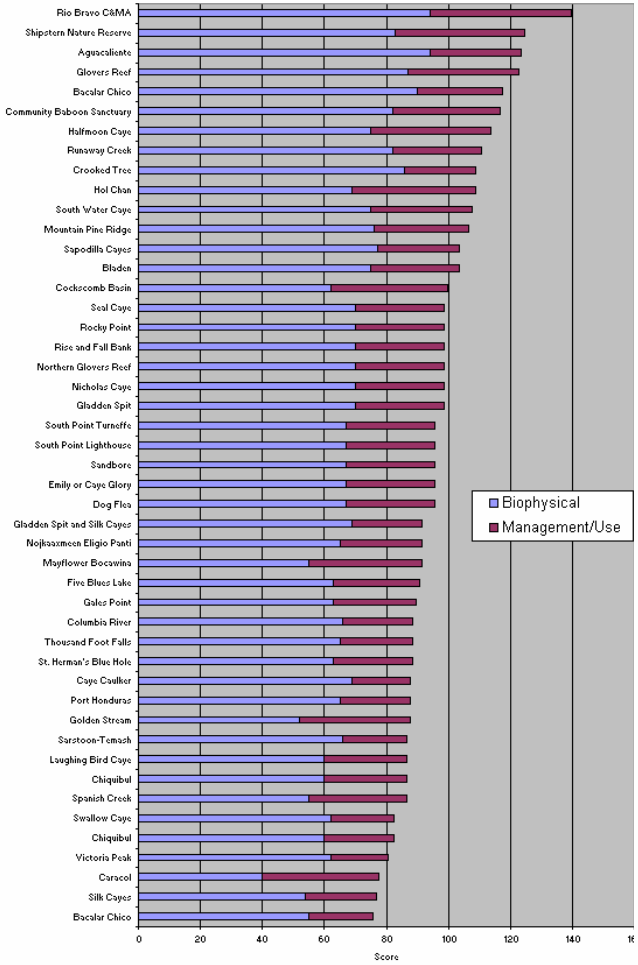
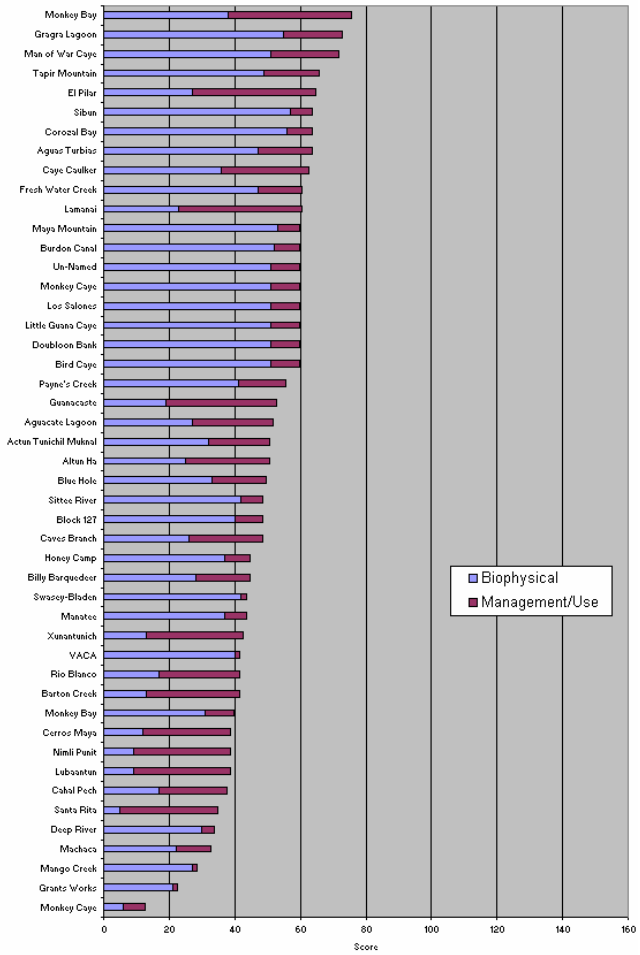
The site scoring system provided three different types of output:

1. Scoring based on biophysical criteria
2. Scoring based on management and land use criteria
3. Scoring based on the combination of biophysical, management and land use criteria

NPAPSP Protected Area Analysis

Site Scoring System





Top 10 protected areas according to a ranking system incorporating **Biophysical as well as Management and Land use criteria** gives the following results:

- Aguacaliente Wildlife Sanctuary,
- Bacalar Chico Marine Reserve,
- Community Baboon Sanctuary,
- Crooked Tree Wildlife Sanctuary,
- Glovers Reef Marine Reserve,
- Halfmoon Caye Natural Monument,
- Hol Chan Marine Reserve,
- Rio Bravo Conservation and Management Area,
- Shipstern Nature Reserve and
- Runaway Creek Private Reserve.

Note that there are 4 Private Protected Areas in this top category!

NPAPSP Protected Area Analysis

Site Scoring System

With a ranking system interpreting the **Biophysical values** only, the outcome is somewhat similar. By this system, the top 10 most ecologically important areas are:

- Aguacaliente Wildlife Sanctuary,
- Bacalar Chico Marine Reserve,
- Community Baboon Sanctuary,
- Crooked Tree Wildlife Sanctuary,
- Glovers Reef Marine Reserve,
- Mountain Pine Ridge Forest Reserve,
- Rio Bravo Conservation and Management Area,
- Runaway Creek Private Reserve,
- Sapodilla Cayes Marine Reserve and
- Shipstern Nature Reserve.

Some small reserves (such as spawning aggregations) come out very high as well. Obviously, in spite of their small size, they are of great importance for biodiversity management. Most archaeological reserves come out very low in this system as a result of a focus on biodiversity values of the ranking system.

NPAPSP Protected Area Analysis

Site Scoring System

The ranking system takes on a different interpretation when selection is on the **managements and land use criteria only**. In this case, the top 10 protected areas are:

•Caracol Archaeological Reserve,
•Cockscomb Basin Wildlife Sanctuary,
•El Pilar Archaeological Reserve,
•Halfmoon Caye Natural Monument,
•Hol Chan Marine Reserve,
•Lamanai Archaeological Reserve,
•Mayflower Bocawina National Park,
•Monkey Bay Private Reserve,
•Rio Bravo Conservation and Management Area and
•Shipstern Nature Reserve.

It is also worth noting that in this ranking system, several of the archaeological reserves come out high (while they came out low in the biophysical values ranking).

In this system some obviously important protected areas come out very low due to the (virtual) absence of formalized management. Good examples of these are the bird sanctuaries.

NPAPSP Protected Area Analysis

MARXAN planning tool

While the site scoring system evaluates the existing protected areas system, there is the need for an analysis of management priorities.

Priorities can be based on a multitude of targets.

With the large variety of conservation targets there is a need to use a **Conservation Planning Optimization Tool.**

NPAPSP Protected Area Analysis

MARXAN planning tool

While the site scoring system evaluates the existing protected areas system, there is the need for an analysis of management priorities.

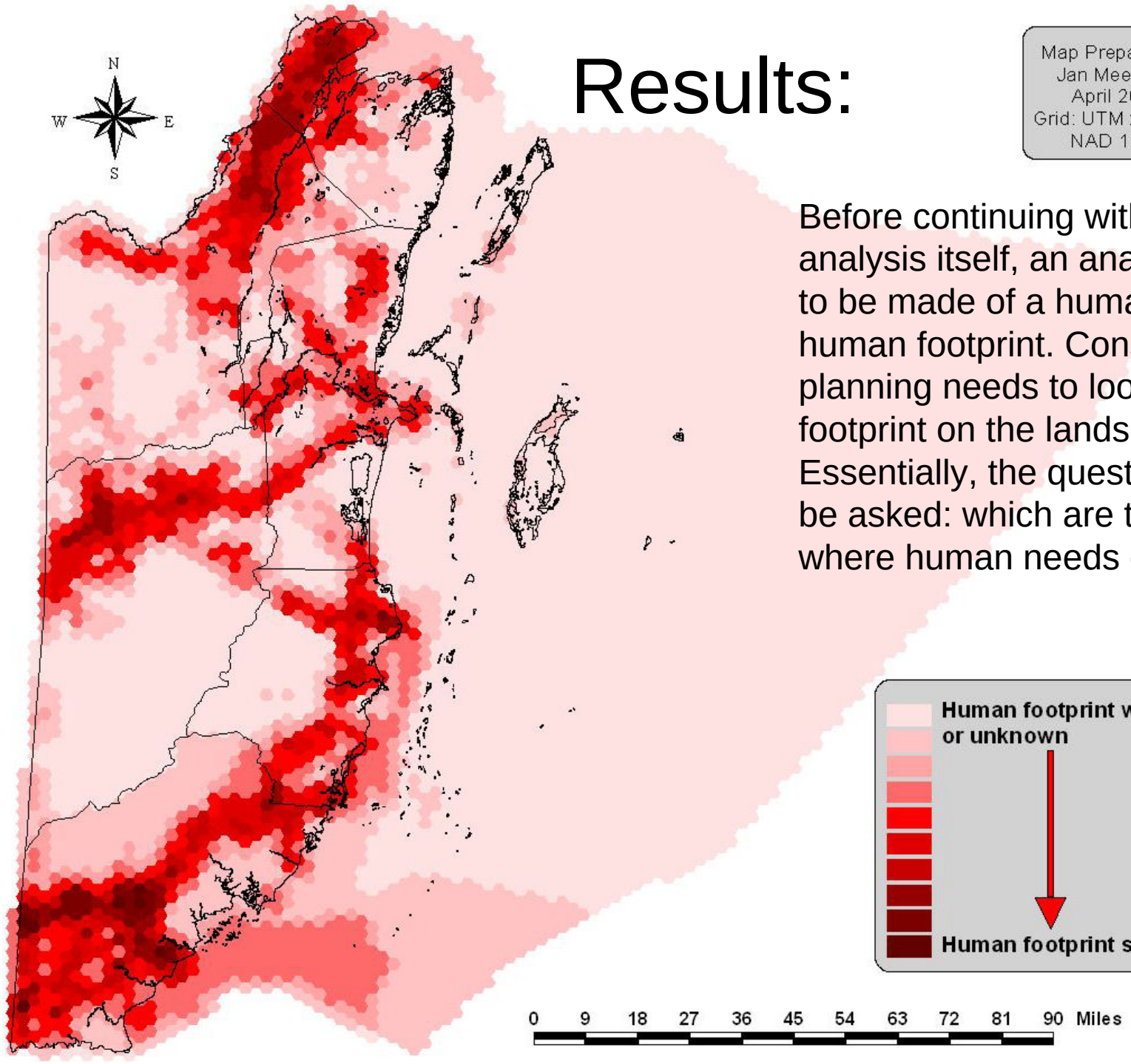
Priorities can be based on a multitude of targets.

With the large variety of conservation targets there is a need to use a **Conservation Planning Optimization Tool.**

MARXAN is software that delivers decision support for reserve system design. MARXAN finds reasonably efficient solutions to the problem of selecting a system of spatially cohesive sites that meet a suite of biodiversity targets. Given reasonably uniform data on species, habitats and/or other relevant biodiversity features and surrogates for a number of planning units MARXAN minimizes the cost while meeting user-defined targets.

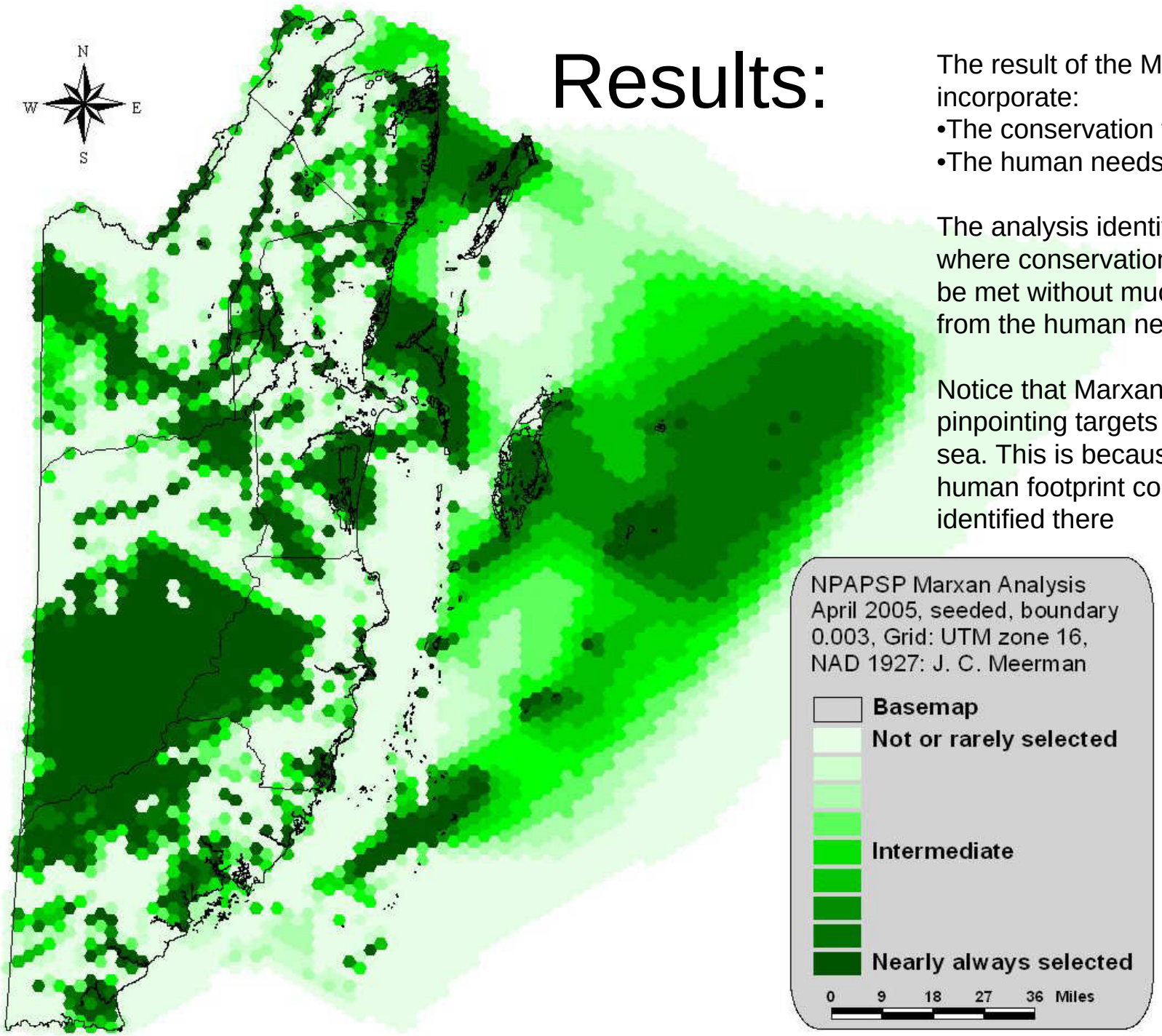
- In the case of this analysis a total of 153 targets were defined.
- Specific goals were set for each of these
- These goals were based largely on their “environmental services”

Results:



Before continuing with the gap analysis itself, an analysis needed to be made of a human needs or human footprint. Conservation planning needs to look at the human footprint on the landscape. Essentially, the question needs to be asked: which are the areas where human needs come first.

Results:



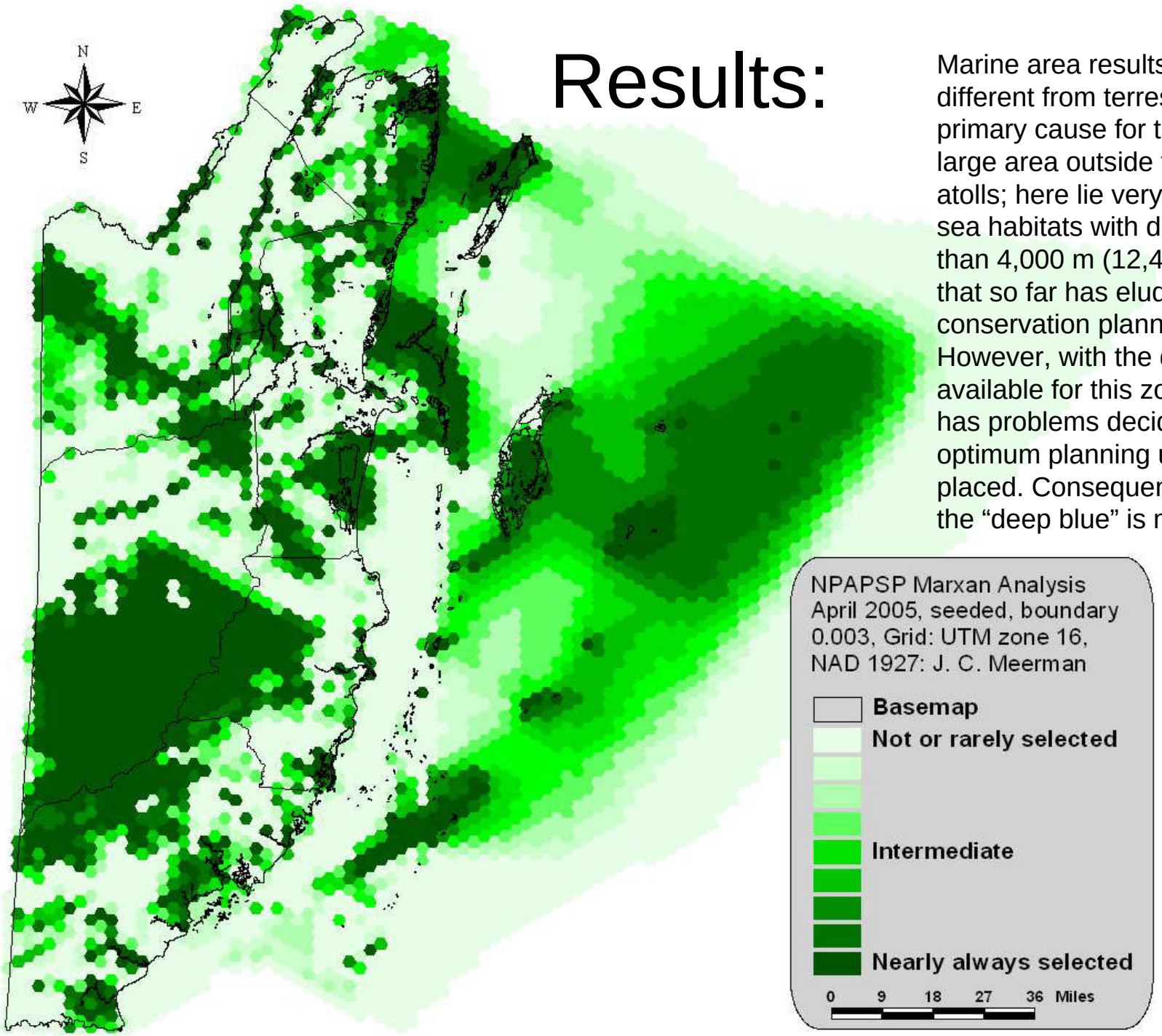
The result of the Marxan analysis incorporate:

- The conservation targets
- The human needs layer

The analysis identifies areas where conservation targets can be met without much interference from the human needs.

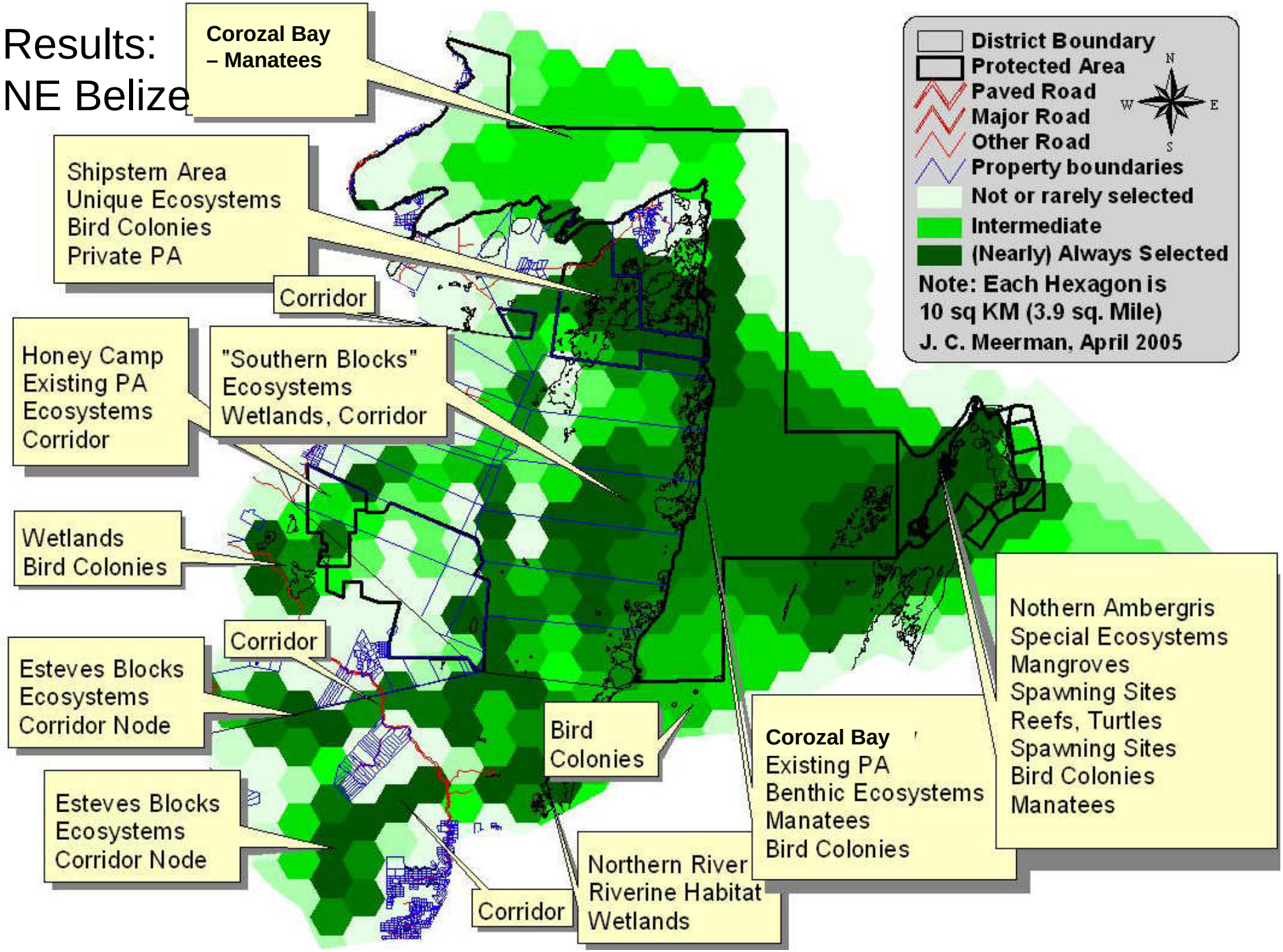
Notice that Marxan had difficulty pinpointing targets in the open sea. This is because no obvious human footprint could be identified there

Results:

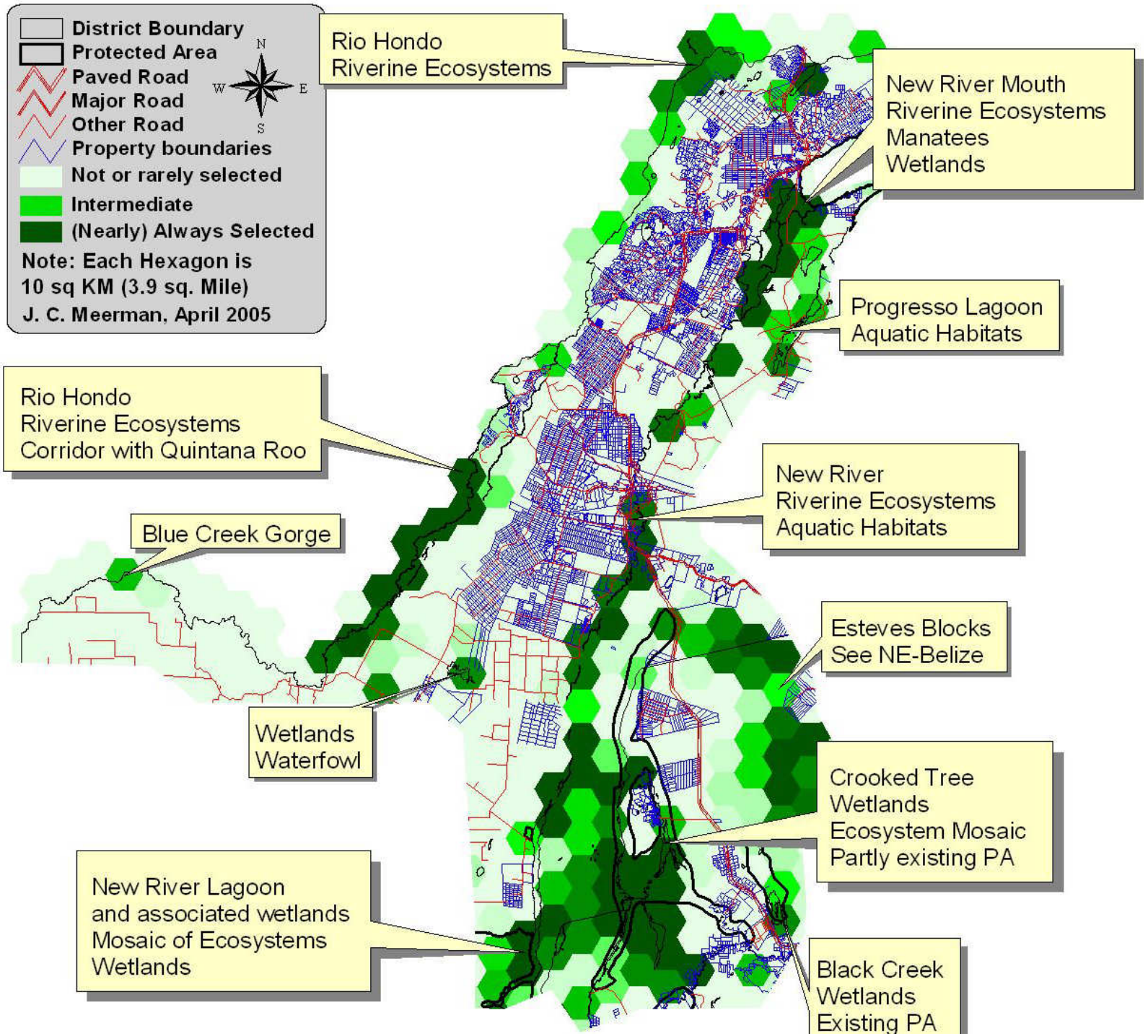


Marine area results appear very different from terrestrial results. The primary cause for this lies in the large area outside the reef and atolls; here lie very important deep sea habitats with depths up to more than 4,000 m (12,400 ft). A zone, that so far has eluded the interest of conservation planners in Belize. However, with the dearth of data available for this zone, MARXAN has problems deciding where the optimum planning units are to be placed. Consequently, the picture in the “deep blue” is more fuzzy.

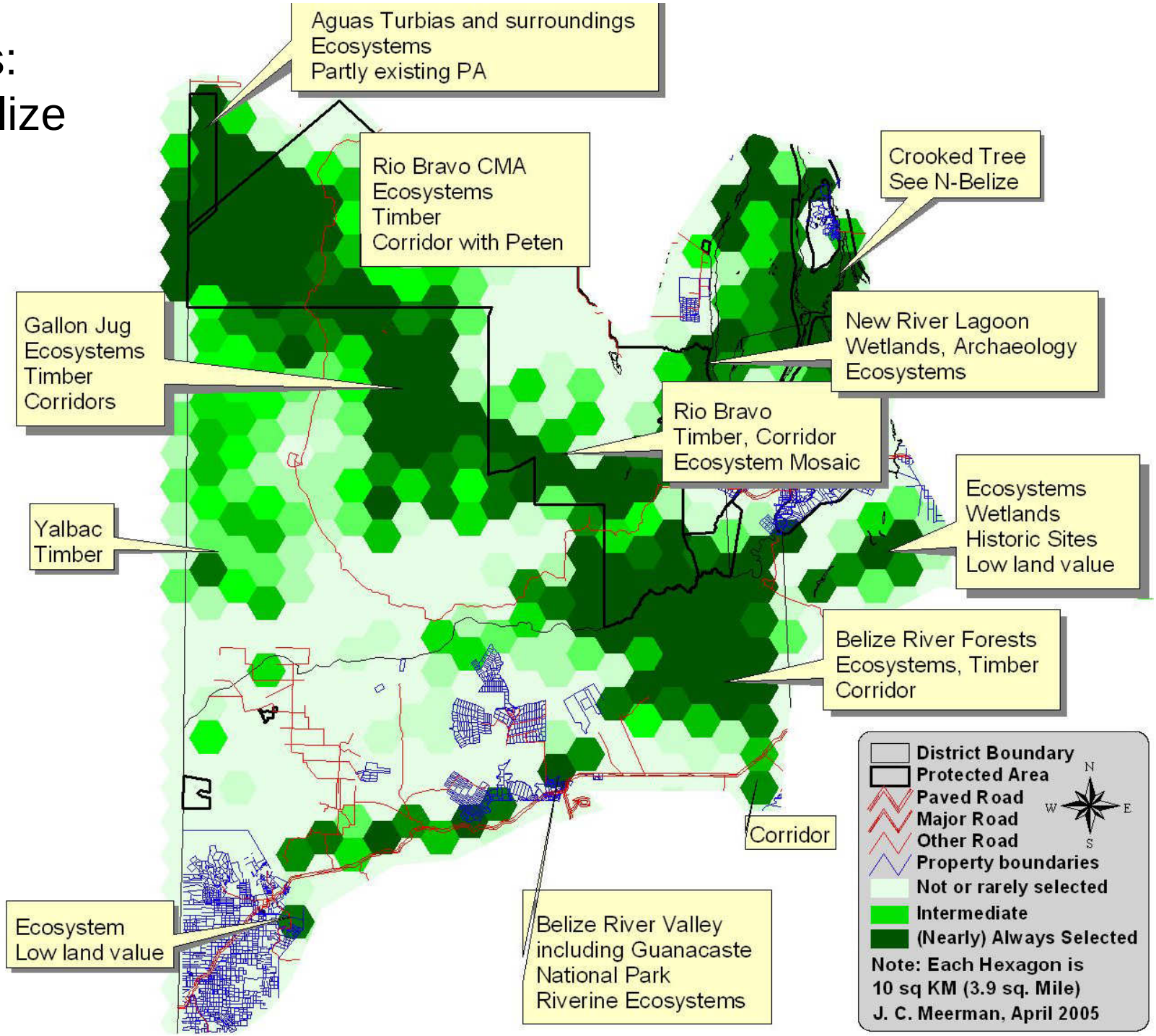
Results: NE Belize

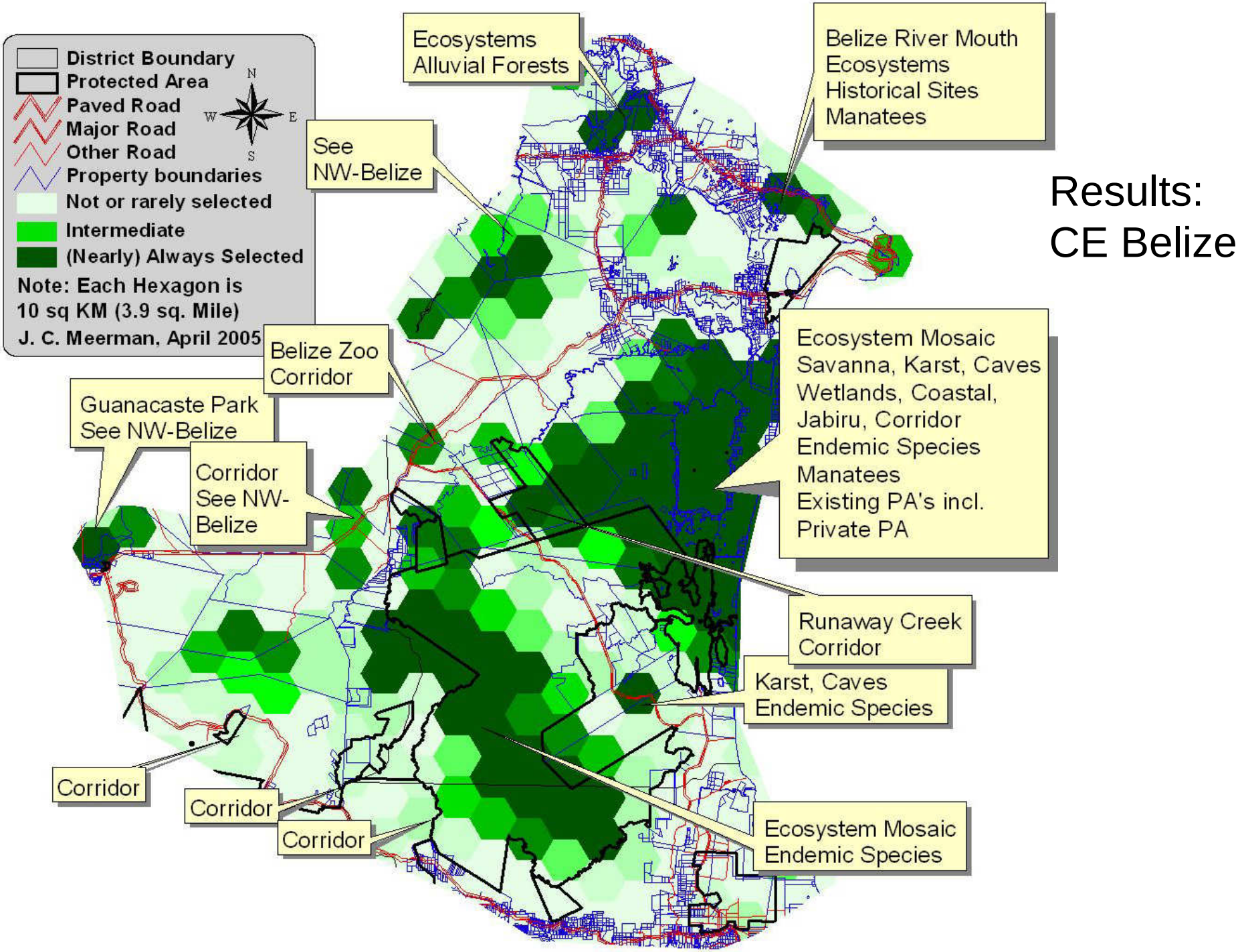


Results: N Belize



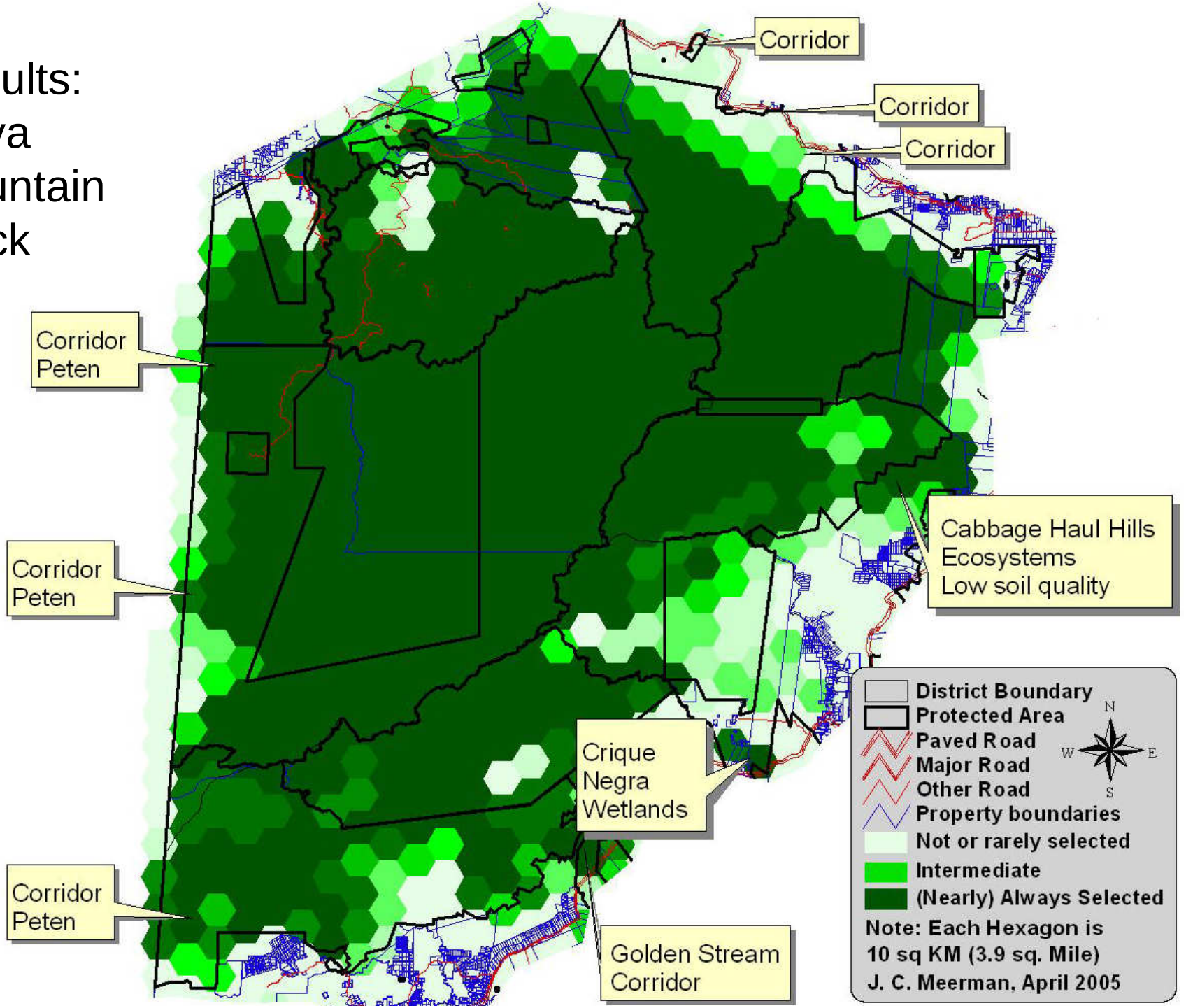
Results:
NW Belize

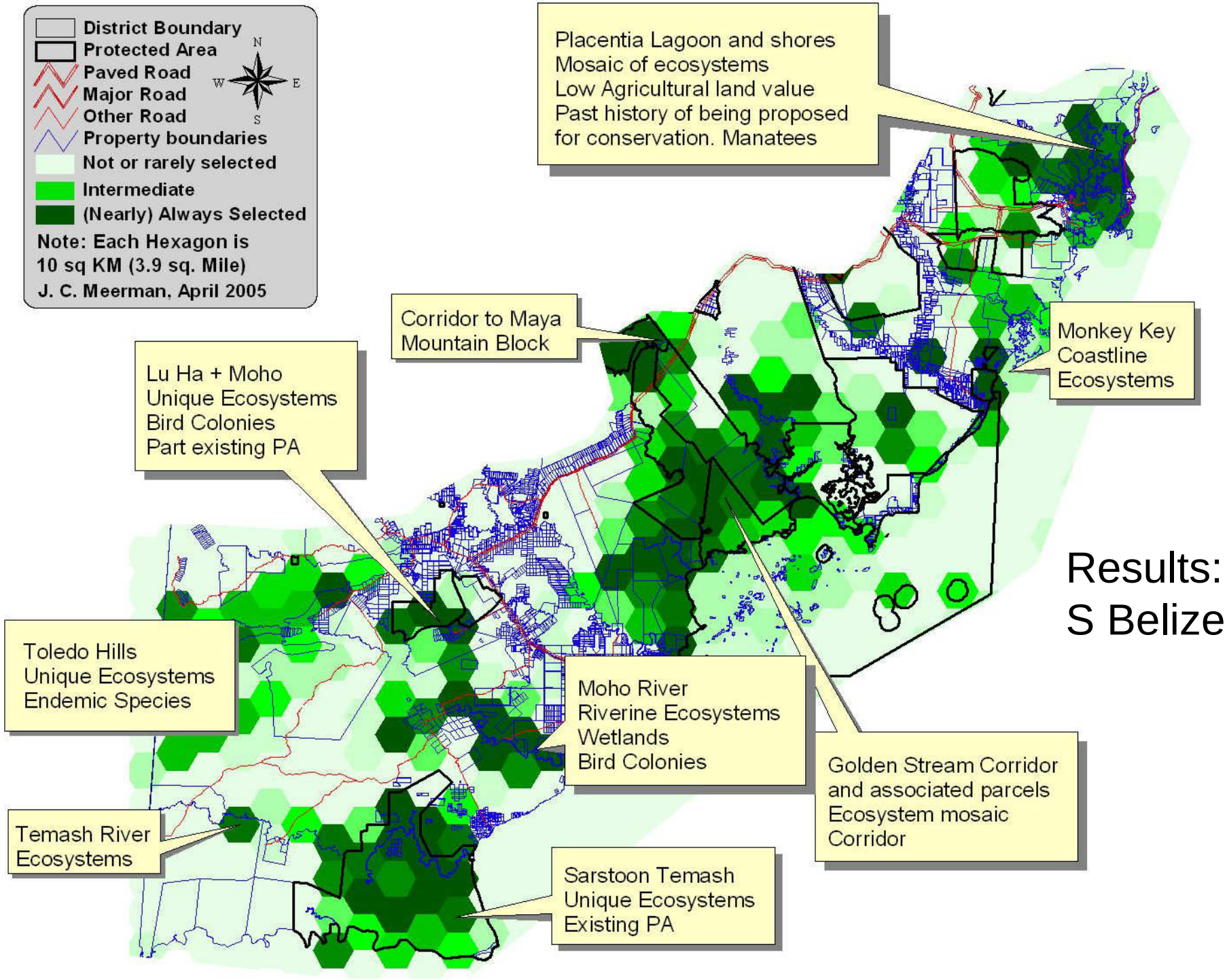




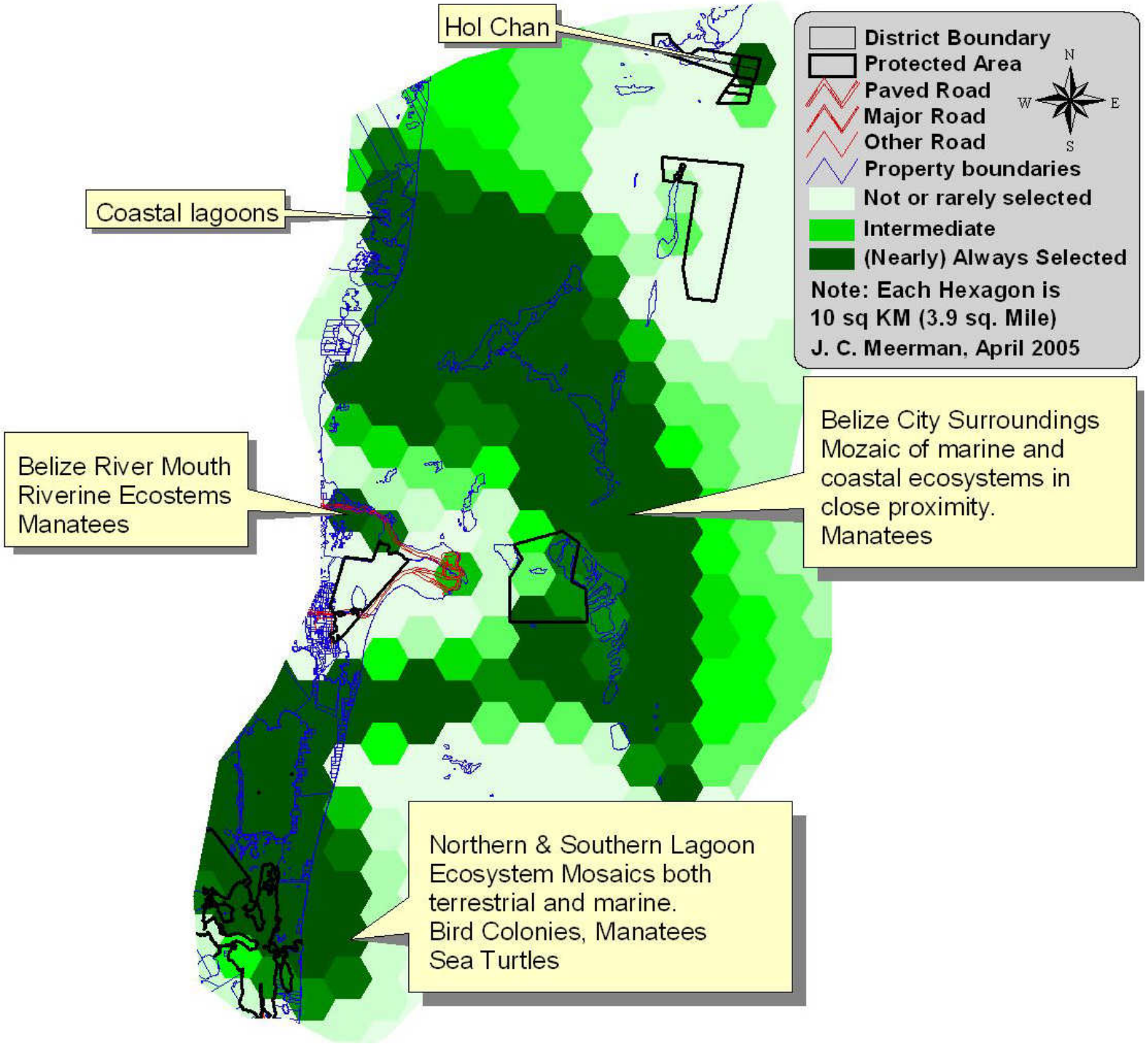
Results: CE Belize

Results: Maya Mountain Block

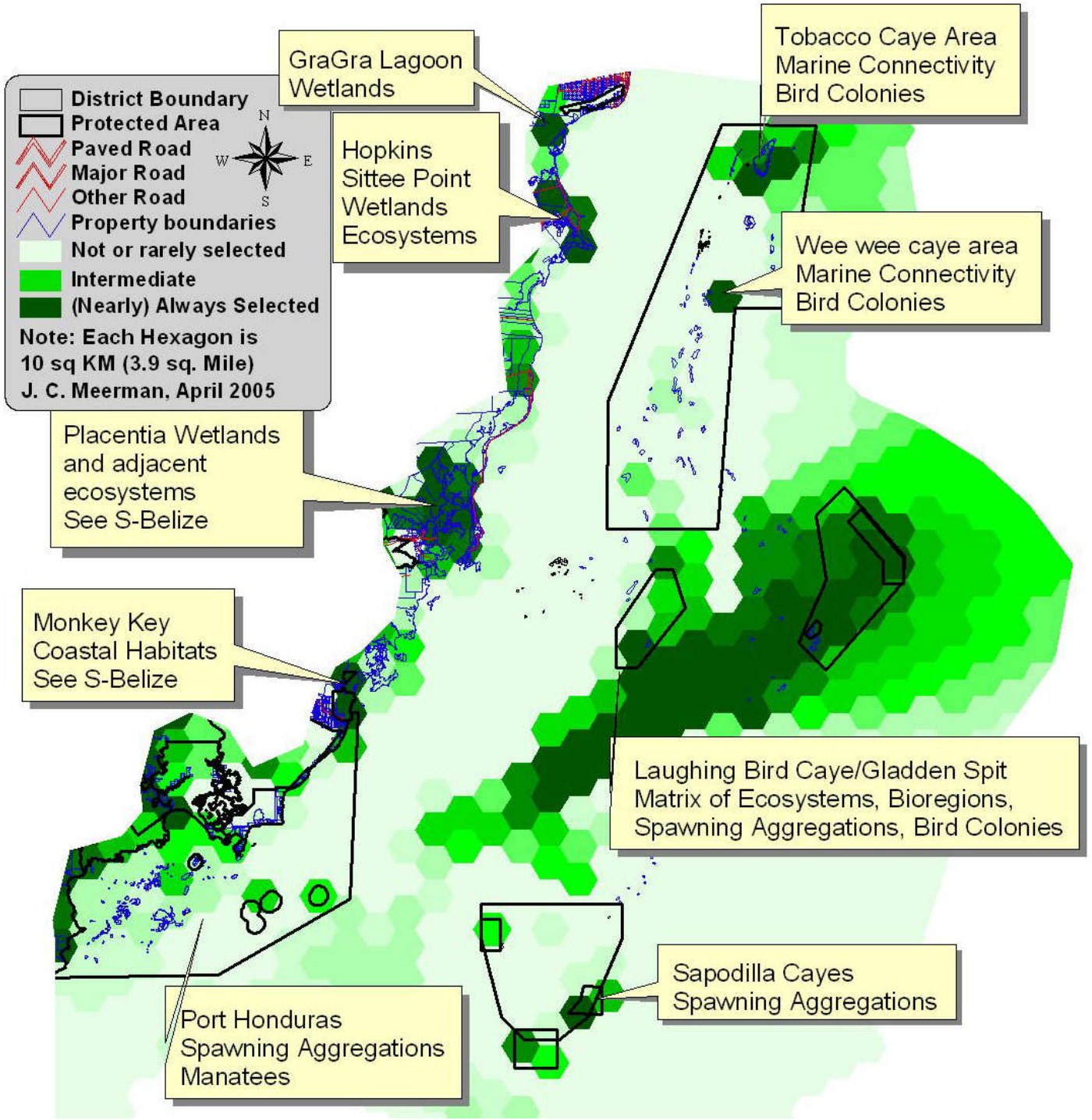



District Boundary
Protected Area
Paved Road
Major Road
Other Road
Property boundaries
Not or rarely selected
Intermediate
(Nearly) Always Selected
Note: Each Hexagon is
10 sq KM (3.9 sq. Mile)
J. C. Meerman, April 2005
N
W
E
S
Placentia Lagoon and shores
Mosaic of ecosystems
Low Agricultural land value
Past history of being proposed
for conservation. Manatees
Corridor to Maya
Mountain Block
Monkey Key
Coastline
Ecosystems
Lu Ha + Moho
Unique Ecosystems
Bird Colonies
Part existing PA
Toledo Hills
Unique Ecosystems
Endemic Species
Moho River
Riverine Ecosystems
Wetlands
Bird Colonies
Golden Stream Corridor
and associated parcels
Ecosystem mosaic
Corridor
Temash River
Ecosystems
Sarstoon Temash
Unique Ecosystems
Existing PA
Results:
S Belize

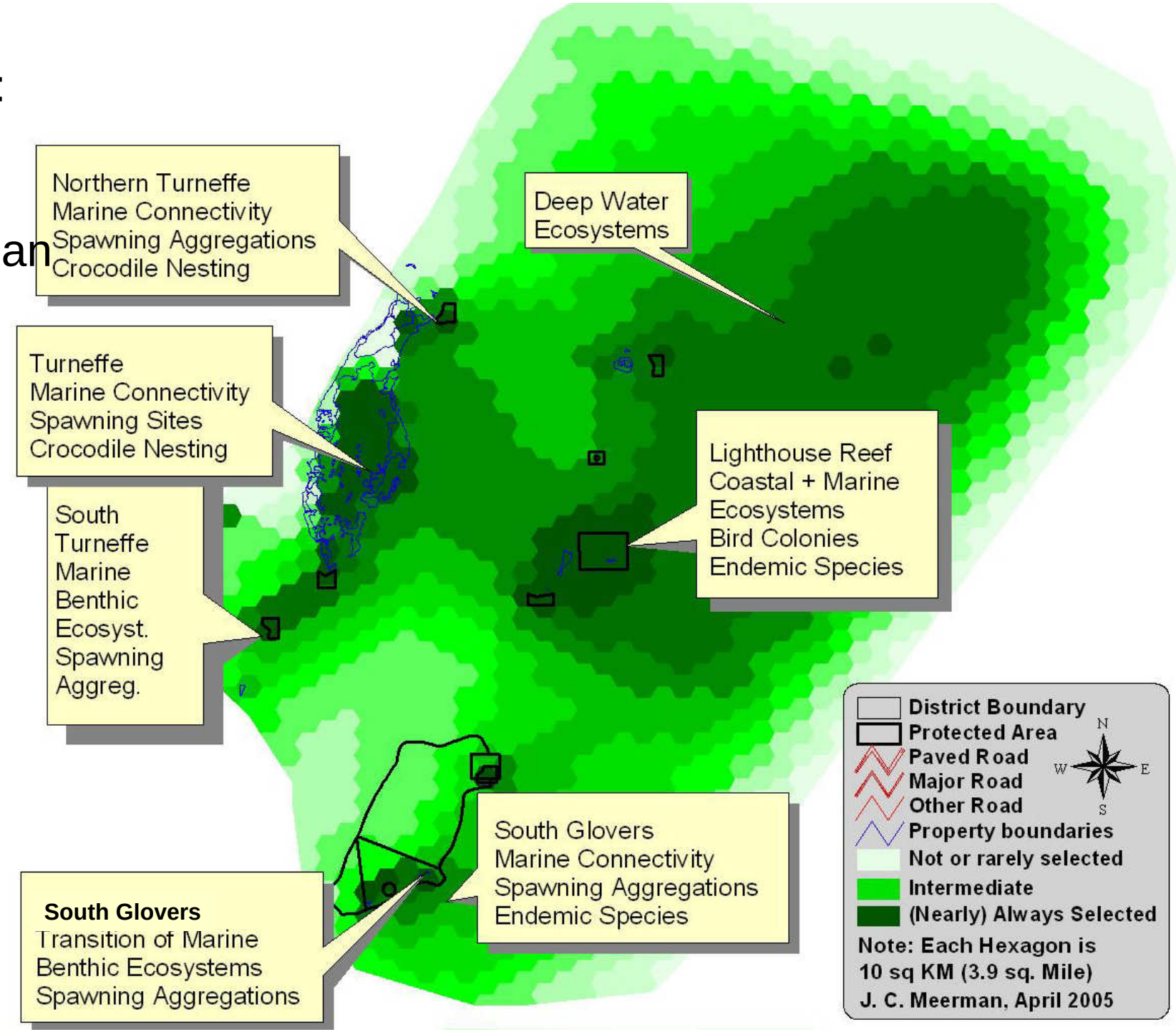
Results: Marine Central



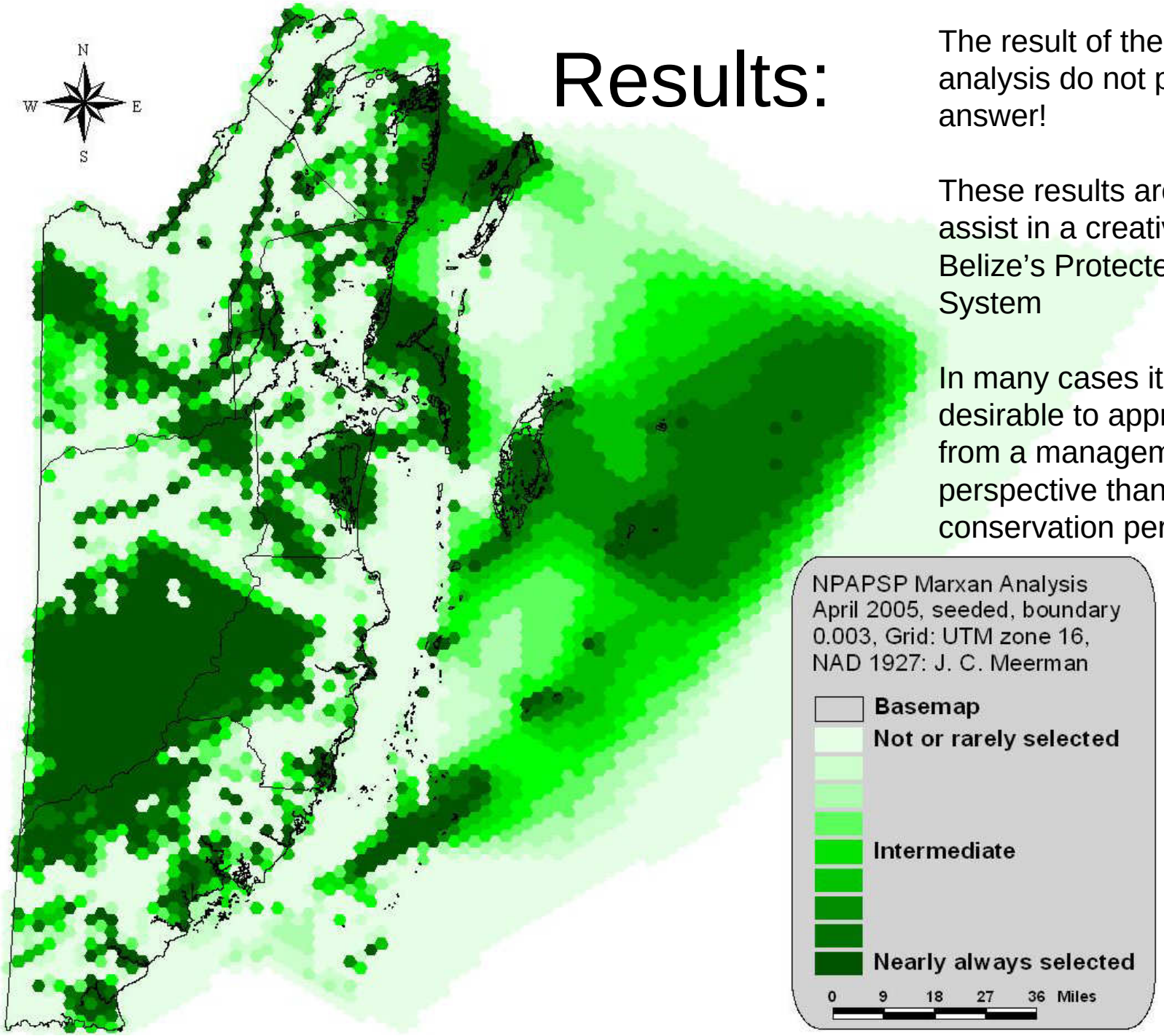
Results: Marine South



Results: Marine Atolls + Caribbean



Results:

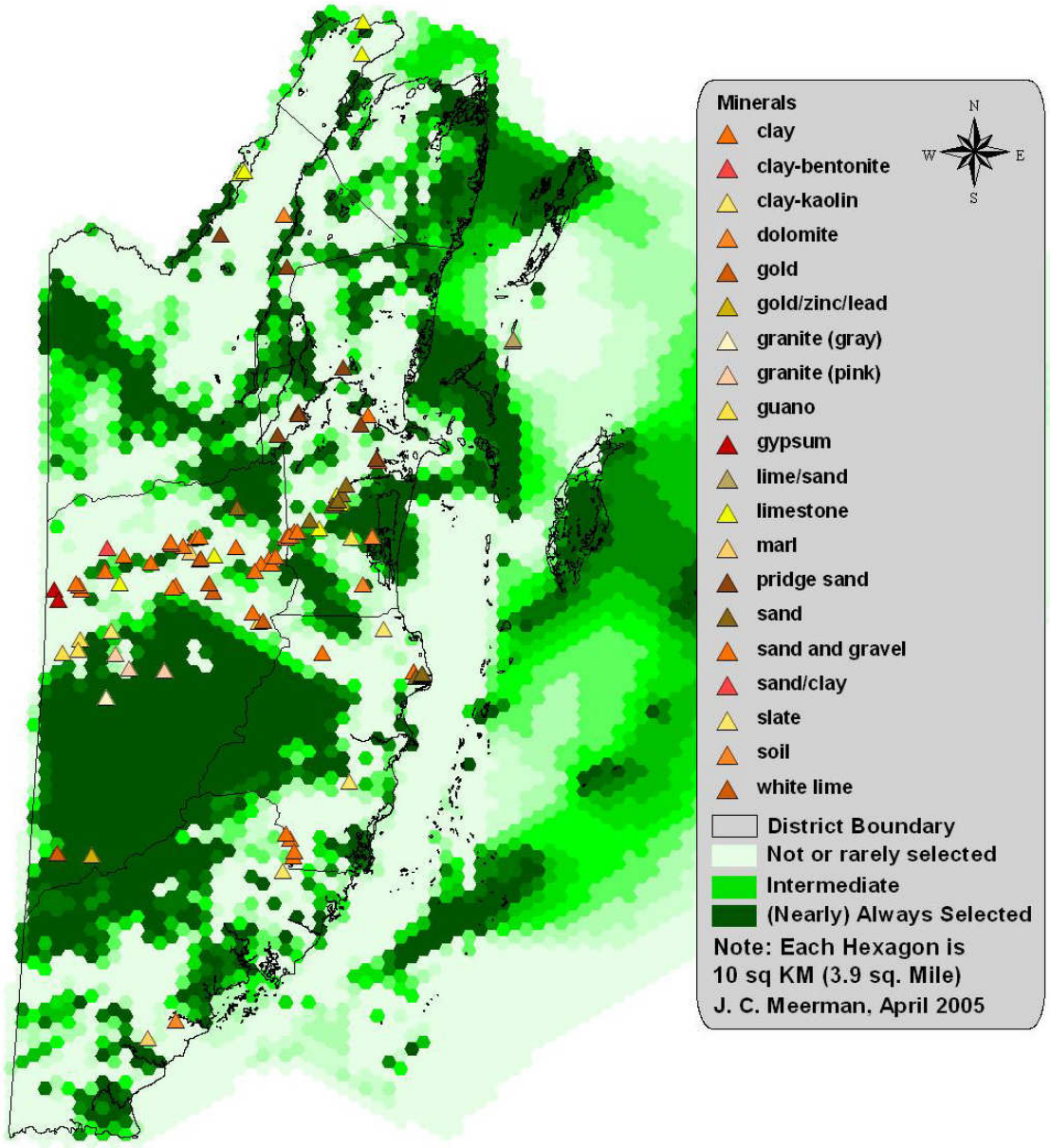


The result of the Marxan analysis do not provide the final answer!

These results are a tool that will assist in a creative redesign of Belize's Protected Areas System

In many cases it will be desirable to approach the result from a managements needs perspective than from a strict conservation perspective.

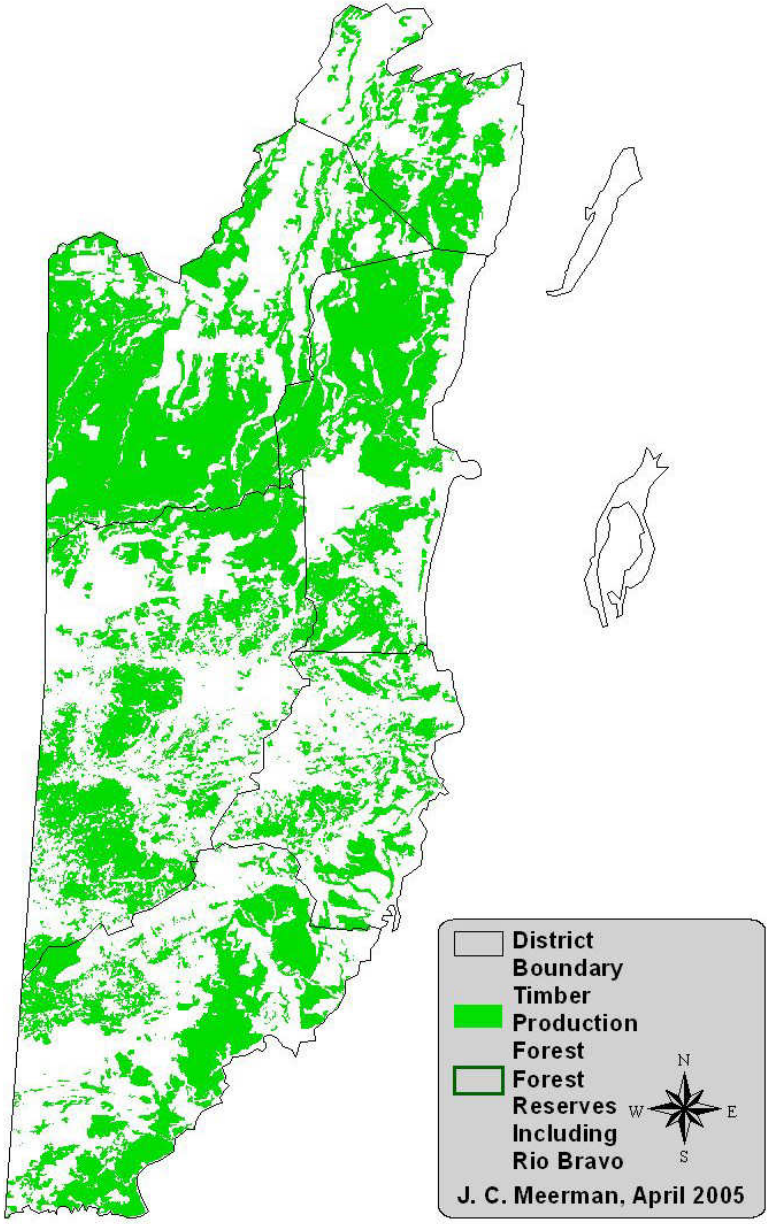
NPAPSP Protected Area Analysis:



Other considerations than just biodiversity are equally important

For example: Known mineral deposits could affect choice of management level.

NPAPSP Protected Area Analysis:



Other considerations than just biodiversity are equally important

Forestry is an other issue that should be considered.

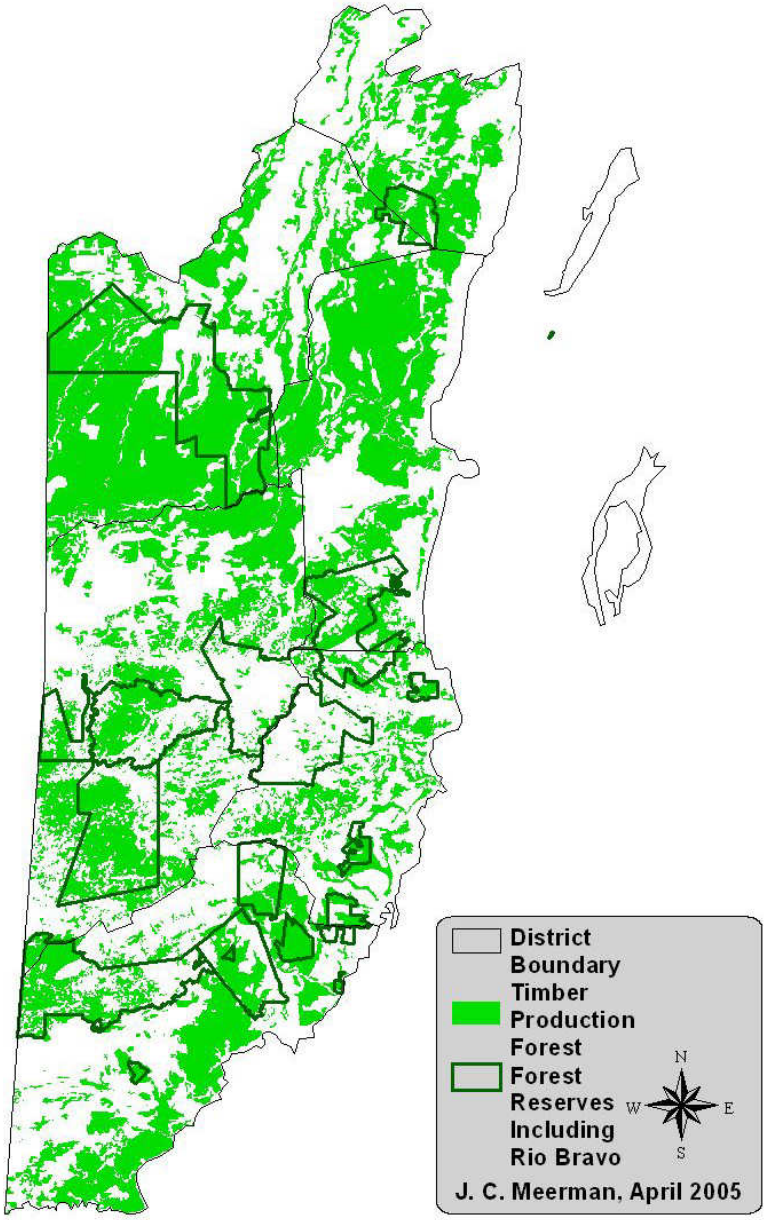
Not all of Belize's forests are suitable for timber production. Much of the area under forest cover is too steep.

There is no good forest inventory showing which forest types are most productive

The map here shows all "tall" forests growing on slopes less than 10%

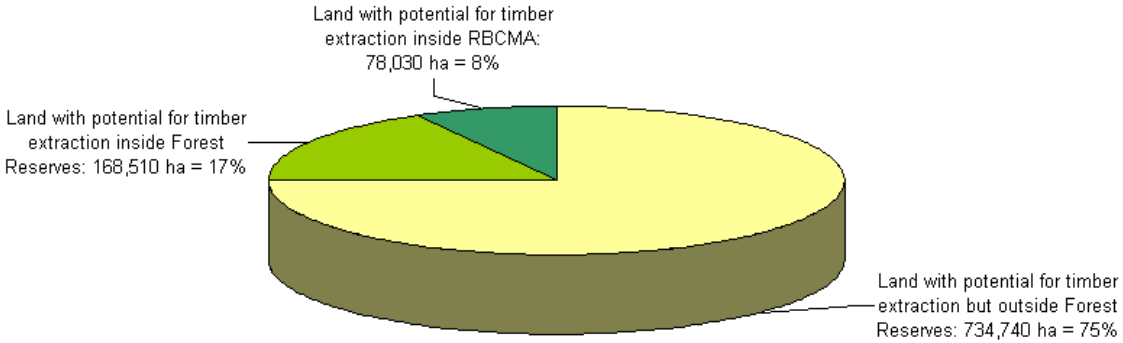
This presents a picture of potential production forest without a distinction between broadleaf and pine and without taking into account existing management zonations.

NPAPSP Protected Area Analysis:



An analysis sets the amount of land with potential for timber extraction at 981,280 ha (2,424,780 acres) of which 168,510 ha (416,390 acres) or 17 % is within Forest Reserves.

If the RBCMA is included as a Forest Reserve, this amount increases to 246,540 ha (609,220 acres) or 25 %.



NPAPSP Protected Area Analysis: Conclusions

- There is no single way of looking at a protected areas system for Belize.
- Multiple considerations are to be taken into account
- Multiple ways exist to do that
- All of them need to be incorporated in a final implementation phase
- This analysis is a tool to be used in the final implementation phase

NPAPSP Protected Area Analysis: Conclusions

- While Belize considers itself as having an extensive Protected Areas System, the reality is that most of that is for the management of resource use and extraction. With the current needs and expectations of the nation of Belize, such a classification of “Management” rather than “Conservation” per se, is probably a more realistic one. A revised “Protected Areas System” should focus on a management of its territory based on its attributes.

- Using the results of the current analysis, it will be possible to re-designate areas for improved management. This management can be for Extractive uses, areas important for economic species, Tourism, Watershed, Soil, Historical Sites, Special Features etc. etc.

NPAPSP Protected Area Analysis: Conclusions

- Re-designing the Protected Areas System should lead to a merging of current protected areas reducing the current number of 115 “management units”. In many cases they could be lumped. Examples are marine reserves where Spawning Aggregations overlap with other marine reserve categories, or the Maya Mountain Block which should be made into one Protected Area with different management zonations based on actual attributes rather than on ancient boundaries.
- The current 115 management units are managed by three departments with a totally different outlook but also with considerably overlap and gray areas. This inefficiency would best be resolved by creating one single agency responsible for all areas of natural resource management.

NPAPSP Protected Area Analysis: Conclusions

- The analysis shows many gaps outside currently existing protected areas. It will not be possible or even desirable to transfer all these lands into some protected area category. Many of the identified gaps have current uses and most of them will be on private land. Creating management regimes, in conjunction with private landowners where needed, may in many cases be sufficient. The Belize Association of Private Protected Areas could potentially fill an important role in relieving GOB of some of the conservation “burden”.
- Currently some of the top protected areas are Privately Managed Reserves. This illustrates the important role of Private Protected Areas Management. This role can be expanded in order to fill the gaps identified during this analysis.

NPAPSP Protected Area Analysis: Conclusions

- There appears to exist a need for community managed conservation areas (Community Baboon Sanctuary, Spanish Creek Wildlife Sanctuary, Mayflower National Park, Rio Blanco National Park etc.). The main desire of these communities is to have an area of “their own” which they can exploit for tourism and recreation or even resource extraction. Principal concern seems to be that many communities feel the need to save certain areas from the ravages of development. In essence, many of the existing or prospective private protected areas come forth out the same perceived need. Aguacate Lagoon near Spanish Lookout is a good example in this aspect. Many of these current and future initiatives may not be within areas currently identified priority areas. Nevertheless, such initiatives still need encouragement and support, but some new management category may need to be created to accommodate such initiatives.

NPAPSP Protected Area Analysis: Conclusions

- Biological Corridors can be identified in the MARXAN analysis. Many are also very weak as shown in the analysis. Largely these potential biological corridors traverse private land. Incentives for landowners to maintain these corridors are needed. Again, the Belize Association of Private Protected Areas could potentially assist GOB in this important endeavor.
- Some areas that were identified as a true or relative priority warrant investigation. Most likely, exact data for such area are lacking. Simple Rapid Ecological Assessments could determine the real importance of such areas. When combined with a social assessment, a best management regime could be identified as well in case the area did warrant some form of conservation management.

NPAPSP Protected Area Analysis: Conclusions

- The deep water ecosystems of Belize have never received any attention, consequently, little is known about them and the software could not map real areas of high importance. More data is clearly needed here. Otherwise there is considerable freedom here to position needed management areas.

NPAPSP Protected Area Analysis: Conclusions

- In general there is still a lack of data that would help conservation planning and management. There is a need for a spatially enabled species database.
- Monitoring of biodiversity is still in its infancy, yet it will be important for the future management of conservation management areas. Sometimes monitoring is complex but sometimes it can be very simple. The apparent absence of monitoring data for bird nesting colonies was noted. Yet, this would be a relatively easy task. There exist good monitoring mechanisms for the marine realm but there is a need for a centralized monitoring database in the terrestrial realm.

NPAPSP Protected Area Analysis:

Next Steps:

- Incorporate YOUR input!
- Production of final report including multimedia CD containing all data
- This final report is to be used as a planning tool in the implementation phase.
- Implementation of a rationalized Protected Areas System

Download draft report:

http://biological-diversity.info/Downloads/Report_result2_finaldraft_s.pdf

PDF file 5,580 kb

NPAPSP Protected Areas Analysis

End

Lead consultant: Jan Meerman