

Belize Protected Areas Policy and System Plan: RESULT 2: Protected Area System Assessment & Analysis Site Scoring System



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Report to the Protected Areas Systems Plan Office (PASPO)

National Protected Area Systems Analysis

Site Scoring System

Introduction

A site scoring system including key Protected Areas system characteristics was developed by modifying an existing Scoring System developed by the Belize Association for Private Protected Areas (BAPPA). This site scoring system works for all protected areas, Government, Private, Terrestrial and Marine. Incorporated characteristics include those of ecological, cultural, social, resource conservation, and economic value including environmental services (Appendix 1).

A first scoring exercise has been conducted involving 94 protected areas (Table 1)¹. The prioritization of the Protected Areas system in this way provides a credible way to prioritize resource allocation, both human and financial. Most sites were scored by individual members of the consortium. Slight differences in interpretation may therefore occur, although care has been taken to avoid such differences. For several protected areas, insufficient information was available to guarantee a totally up-to-date analysis. At some stage this site scoring effort should be repeated, preferably in a “workshop” environment involving as many protected area management agencies as possible.

The scoring system has two components, one focuses on the biological, ecological and physical attributes of the protected area. The second component looks at management and use issues. This two prong approach allows for three different ways in which to analyze the results. The two components also allow a first analysis of management efficiency/needs. For example, when a protected area has a high biophysical score but a low management/use score, this may be an indication that management of that site needs improvement.



Figure 1. Five Blues Lake National Park

¹ Also available as original excel spreadsheet on resource CD

Table 1. Tentative site scoring values for Belize Protected Areas

		Loc./conn.	Size	Sp. Habitats	Sp. Features	State	Imp.breeding	Roost/feed	Endemic	EndangSpec	CritHab	Score Bioph	Ownership	Info	Management	Science	Strict Cons	T & R	Man. Extractio	Dev. Activites	Infrastructure	Score Land	Total score
Actun Tunichil Mukna	Natural Monument	3	8		5	10				6		32	5	0	4		4	4			2	19	51
Aguacaliente	Wildlife Sanctuary	10	15	12	10	6	15	8	8	6	4	94	5	4	4		4	4			9	30	124
Aguacate Lagoon	Private Reserve		8		5	4				6	4	27	5	0	8		4	4		-5	9	25	52
Aguas Turbias	National Park	9	15	6	5	6				6		47	5	8	0		4					17	64
Altun Ha	Archaeological Res	6	4		5	4				6		25	5	0	4	8		4			5	26	51
Bacalar Chico	Marine Reserve	6	15	12	10	6	15	8	8	6	4	90	5	8	4			4	2		5	28	118
Bacalar Chico	National Park	10	15	12		8				6	4	55	5	4	4		4	4				21	76
Barton Creek	Archaeological Reserve				5	8						13	5	4	8	8		4		-5	5	29	42
Billy Barquedeer	National Park	3	4		5	10				6		28	5	0	4		4	4				17	45
Bird Caye	Bird Sanctuary			12	10	10	15				4	51	5	0	0	0	4	0				9	60
Bladen	Nature Reserve	10	15	12	10	10			8	6	4	75	5	8	4	8	4					29	104
Block 127	Private Reserve	6	15		5	8				6		40	5	0	0		4					9	49
Blue Hole	Natural Monument		8	6	5	8				6		33	5		4		4	4				17	50
Burdon Canal	Nature Reserve		15	12	5	4		8	8			52	5	4	0		4			-5		8	60
Cahal Pech	Archaeological Reserve	4			5	2				6		17	5	0	4	8		4		-5	5	21	38
Caracol	Archaeological Res	6	15		5	8				6		40	5	8	4	8	4	4			5	38	78
Caves Branch	Archaeological Res	3			5	8				6	4	26	5	0	4	8		4			2	23	49
Caye Caulker	Forest Reserve	3	4		5	6		8		6	4	36	5	4	4	8		4		-5	7	27	63
Caye Caulker	Marine Reserve	6	15	12	5	6	15			6	4	69	5	4	4			4	2	-5	5	19	88
Cerros Maya	Archaeological Res	3	0		5	4						12	5	4	4	8		4			2	27	39
Chiquibul	Forest Reserve	10	15	12	5	8				6	4	60	5	4	4	8			2			23	83
Chiquibul	National Park	10	15	12	5	8				6	4	60	5	4	4	8	4				2	27	87
Cockscomb Basin	Wildlife Sanctuary	10	15	12	5	10				6	4	62	5	4	4	8	4	4			9	38	100
Columbia River	Forest Reserve	10	15	12	5	6			8	6	4	66	5	4	4	8			2			23	89
Community Baboon	Private Reserve	10	15	12	10	2	15		8	6	4	82	5	4	4	8	4	4	2	-5	9	35	117
Corozal Bay	Wildlife Sanctuary	10	15	6	5	2		8		6	4	56	5	4	0			4		-5		8	64
Crooked Tree	Wildlife Sanctuary	10	15	12	10	6	15	8		6	4	86	5	4	4		4	4		-5	7	23	109
Deep River	Forest Reserve	6	12	6		6						30	5	0	0			2	-5	2	4	34	
Dog Flea	Spawning Aggregation	12	12	10	8	15				6	4	67	5	8	4	8	4					29	96
Doubloon Bank	Bird Sanctuary			12	10	10	15				4	51	5	0	0	0	4	0				9	60
El Pilar	Archaeological Reserve	12			5	4				6		27	5	8	4	8		4			9	38	65

Table 1. Tentative site scoring values for Belize Protected Areas

		Loc./conn.	Size	Sp. Habitats	Sp. Features	State	Imp.breeding	Roost/feed	Endemic	EndangSpec	CritHab	Score Bioph	Ownership	Info	Management	Science	Strict Cons	T & R	Man. Extractio	Dev. Activites	Infrastructure	Score Land	Total score
Emily or Caye Glory	Spawning Aggregation	12	12	10	8	15				6	4	67	5	8	4	8	4					29	96
Five Blues Lake	National Park	6	15	6	10	8			8	6	4	63	5	4	4		4	4			7	28	91
Fresh Water Creek	Forest Reserve	10	15	8		4				6	4	47	5	4	4			2	-5	4	14	61	
Gales Point	Wildlife Sanctuary	3	15	6	10	4	15			6	4	63	5	4	4	8		4		-5	7	27	90
Gladden Spit	Spawning Aggregat	3	12	12	10	8	15			6	4	70	5	8	4	8	4					29	99
Gladden Spit and Silk	Marine Reserve	3	15	6	10	6	15	8		6		69	5	4	4	8		2				23	92
Glovers Reef	Marine Reserve	6	15	12	15	6	15		8	6	4	87	5	8	4	8		4	2		5	36	123
Golden Stream	Private Reserve	10	15	6	5	6				6	4	52	5	4	8	8	4				7	36	88
Gragra Lagoon	National Park	6	12	6	5	8		8		6	4	55	5	4	4		4	4		-5	2	18	73
Grants Works	Forest Reserve		15			6						21	5					2	-5			2	23
Guanacaste	National Park		4		5	4				6		19	5	4	8		4	4			9	34	53
Halfmoon Caye	Natural Monument		15	10	5	4	15	8	8	6	4	75	5	8	8	8	4	4		-5	7	39	114
Hol Chan	Marine Reserve	6	15	10	5	8	15			6	4	69	5	8	8	8		4	2		5	40	109
Honey Camp	National Park	10	15			6				6		37	5	2			4			-5	2	8	45
Lamanai	Archaeological Reserve		8		5	4				6		23	5	8	4	8		4			9	38	61
Laughing Bird Caye	National Park	3	15	8	5	4	15			6	4	60	5	4	8		4	4	2	-5	5	27	87
Little Guana Caye	Bird Sanctuary			12	10	10	15				4	51	5	0	0	0	4	0				9	60
Los Salones	Bird Sanctuary			12	10	10	15				4	51	5	0	0	0	4	0				9	60
Lubaantun	Archaeological Reserve				5	4						9	5	0	4	8		4			9	30	39
Machaca	Forest Reserve	10	10			2						22	5		4			2	-5	5	11	33	
Man of War Caye	Bird Sanctuary			12	10	10	15				4	51	5	4	4	0	4	4				21	72
Manatee	Forest Reserve	3	15		5	8				6		37	5					2				7	44
Mango Creek	Forest Reserve		15			6				6		27	5					2	-5			2	29
Maya Mountain	Forest Reserve	6	15		10	8			8	6		53	5					2				7	60
Mayflower Bocawina	National Park	6	15		10	6			8	6	4	55	5	8	4	8	4	4		-5	9	37	92
Monkey Bay	National Park		15			10				6		31	5				4					9	40
Monkey Bay	Private Reserve		15		5	4			8	6		38	5	4	8	8		4			9	38	76
Monkey Caye	Bird Sanctuary			12	10	10	15				4	51	5	0	0	0	4	0				9	60
Monkey Caye	Forest Reserve					6						6	5					2				7	13
Mountain Pine Ridge	Forest Reserve	10	15	12	15	6			8	6	4	76	5	4	4	8		4	2	-5	9	31	107
Nicholas Caye	Spawning Aggregat	3	12	12	10	8	15			6	4	70	5	8	4	8	4					29	99
Nimli Punit	Archaeological Reserve				5	4						9	5	0	4	8		4			9	30	39

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Nojkaaxmeen Eligio F National Park		6	15	8	10	8			8	6	4	65	5	4	4		4	4	2	5	9	27	92
Northern Glovers Rec Spawning Aggregat		3	12	12	10	8	15			6	4	70	5	8	4	8	4					29	99
Payne's Creek National Park		10	15			10				6		41	5	2	4		4					15	56
Port Honduras Marine Reserve		3	15	6	10	6	15			6	4	65	5	4	4	8			2			23	88
Rio Blanco National Park			4		5	2				6		17	5	4	4		4	4		-5	9	25	42
Rio Bravo C&MA Private Reserve		10	15	10	10	8	15	8	8	6	4	94	5	8	10	8		4	2		9	46	140
Rise and Fall Bank Spawning Aggregat		3	12	12	10	8	15			6	4	70	5	8	4	8	4					29	99
Rocky Point Spawning Aggregat		3	12	12	10	8	15			6	4	70	5	8	4	8	4					29	99
Runaway Creek Private Reserve		10	15	8	8	8	15		8	6	4	82	5	8	4	8	4					29	111
Sandbore Spawning Aggregation		12	12	10	8	15				6	4	67	5	8	4	8	4					29	96
Santa Rita Archaeological Reserve					5	0						5	5	0	4	8		4			9	30	35
Sapodilla Cayes Marine Reserve		6	15	12	5	6	15	8		6	4	77	5	4	4	8		4	2	-5	5	27	104
Sarstoon-Temash National Park		6	15	12	15	8				6	4	66	5	8	4		4					21	87
Seal Caye Spawning Aggregat		3	12	12	10	8	15			6	4	70	5	8	4	8	4					29	99
Shipstern Nature Res Private Reserve		10	15	12	5	8	15	8		6	4	83	5	8	4	8	4	4			9	42	125
Sibun Forest Reserve		10	15		10	8			8	6		57	5						2			7	64
Silk Cayes Marine Reserve		3	8	6	10	6	15			6		54	5	4	4	8			2			23	77
Sittee River Forest Reserve		3	15		10	8				6		42	5						2			7	49
South Point Lighthouse Spawning Aggregation		12	12	10	8	15				6	4	67	5	8	4	8	4					29	96
South Point Turneffe Spawning Aggregation		12	12	10	8	15				6	4	67	5	8	4	8	4					29	96
South Water Caye Marine Reserve		6	15	12	5	4	15	8		6	4	75	5	8	4	8	2	4	2	-5	5	33	108
Spanish Creek Wildlife Sanctuary		10	15		10	10				6	4	55	5	8	4		4	4			7	32	87
St. Herman's Blue Hole National Park		10	15		10	10			8	6	4	63	5		4		4	4			9	26	89
Swallow Caye Wildlife Sanctuary			15	6	10	6	15			6	4	62	5	4	4		4	4				21	83
Swasey-Bladen Forest Reserve		3	15		10	8				6		42	5					2	-5			2	44
Tapir Mountain Nature Reserve		6	15			10			8	6	4	49	5	4	4		4					17	66
Thousand Foot Falls Natural Monument			12	8	10	10	15			6	4	65	5		4		4	4			7	24	89
Un-Named Bird Sanctuary				12	10	10	15				4	51	5	0	0	0	4	0				9	60
Vaca Forest Reserve		3	15		10	6				6		40	5					2	-5			2	42
Victoria Peak Natural Monument		10	15	12	5	10				6	4	62	5		4		4	4			2	19	81
Xunantunich Archaeological Reserve		4			5	4						13	5	0	4	8		4			9	30	43

Results

A first analysis of this prioritization exercise is presented in Tables 2 through 4 (each Table cut in two pieces for visibility).

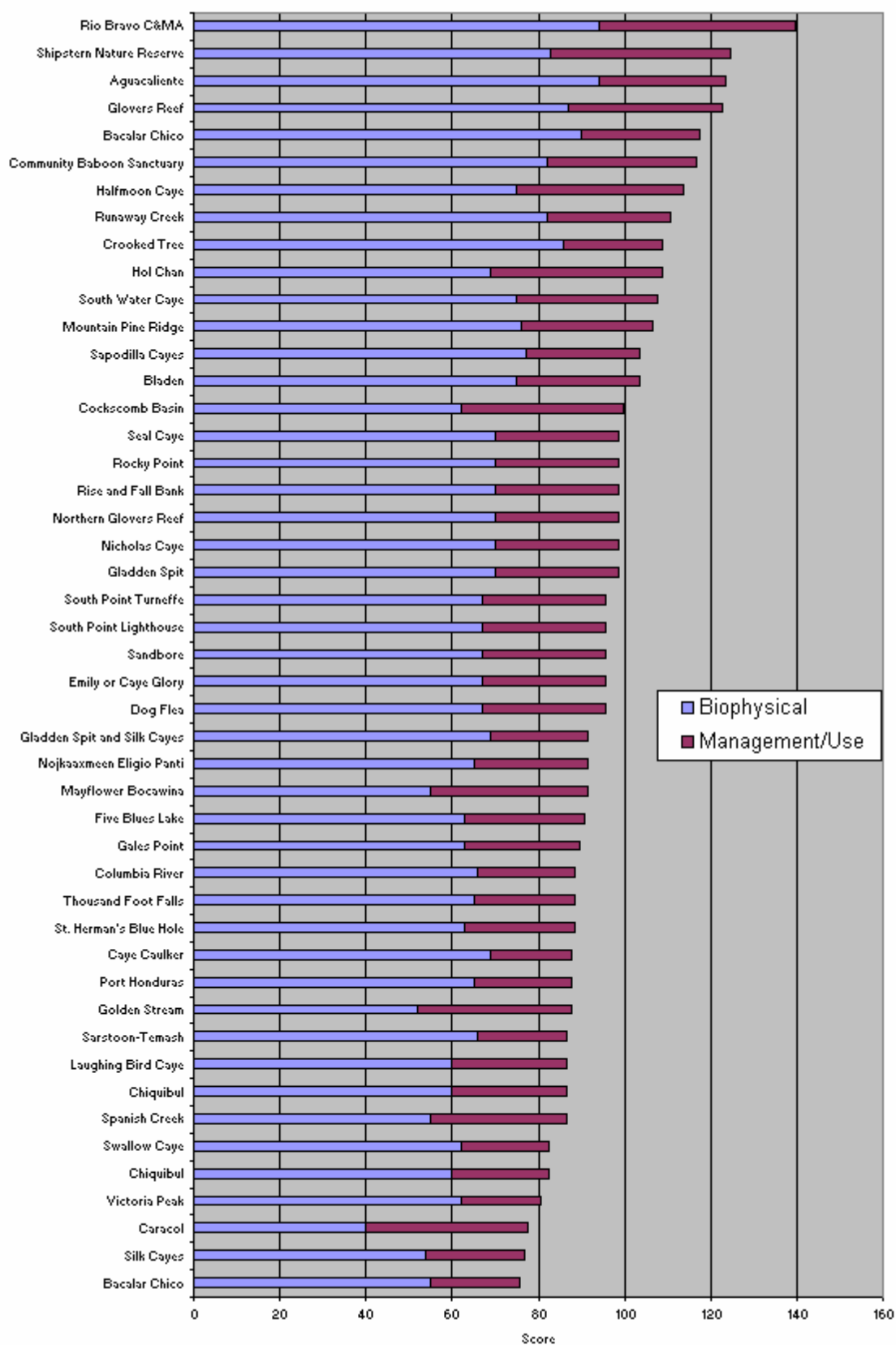
The first approach is by combining both the **Biophysical as well as Management/Land use criteria**. The result of this is presented in Table 2. Top 10 protected areas by this standard are in alphabetical order:

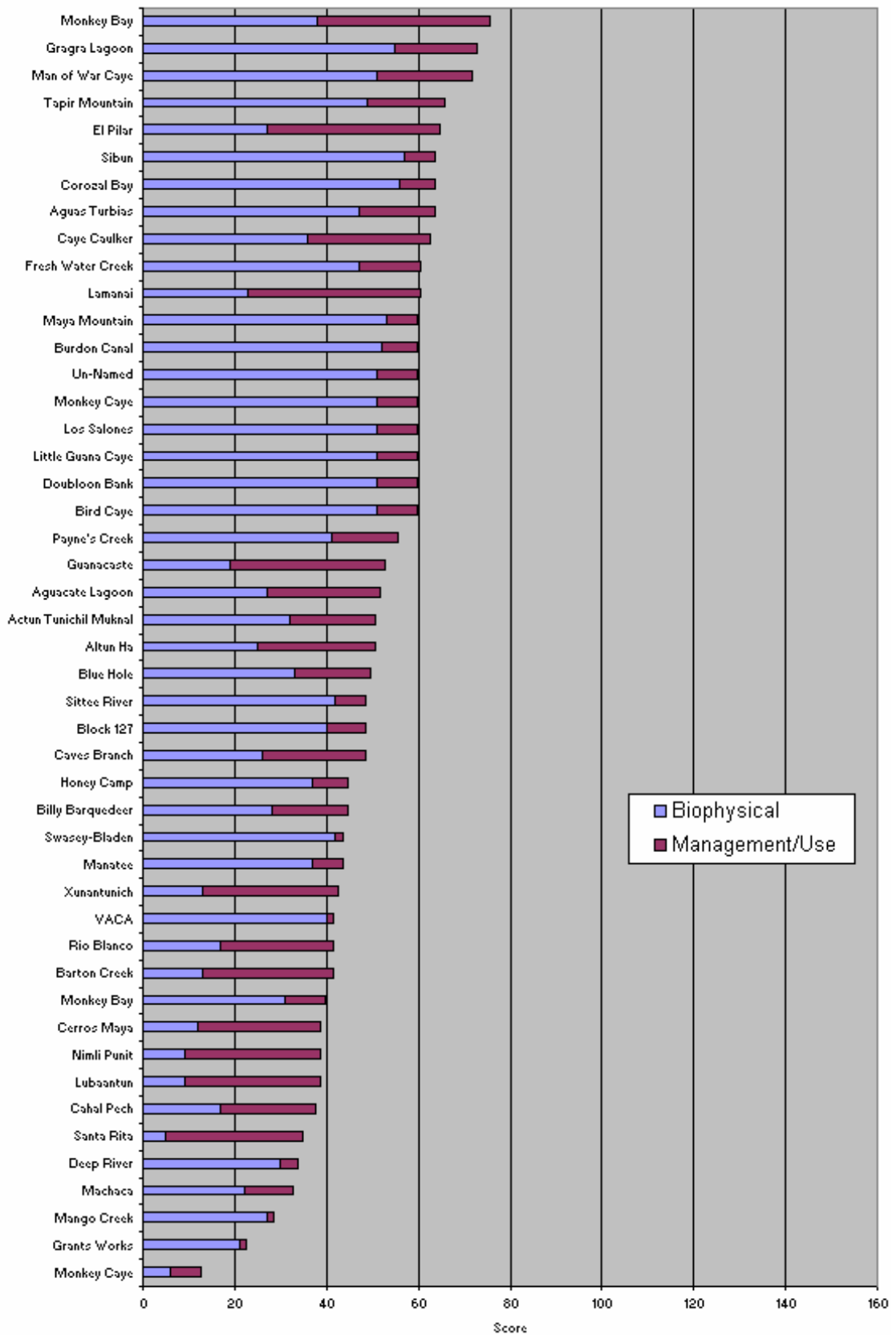
- Aguacaliente Wildlife Sanctuary,
- Bacalar Chico Marine Reserve,
- Community Baboon Sanctuary,
- Crooked Tree Wildlife Sanctuary,
- Glovers Reef Marine Reserve,
- Halfmoon Caye Natural Monument,
- Hol Chan Marine Reserve,
- Rio Bravo Conservation and Management Area,
- Shipstern Nature Reserve and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

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

Although size is an important factor in this analysis, the result shows that size is not all-important. Several small sites such as most of the spawning sites come out high in spite of their small size.

Table 2. Protected Area Ranking System combining Biophysical and Management/Use values





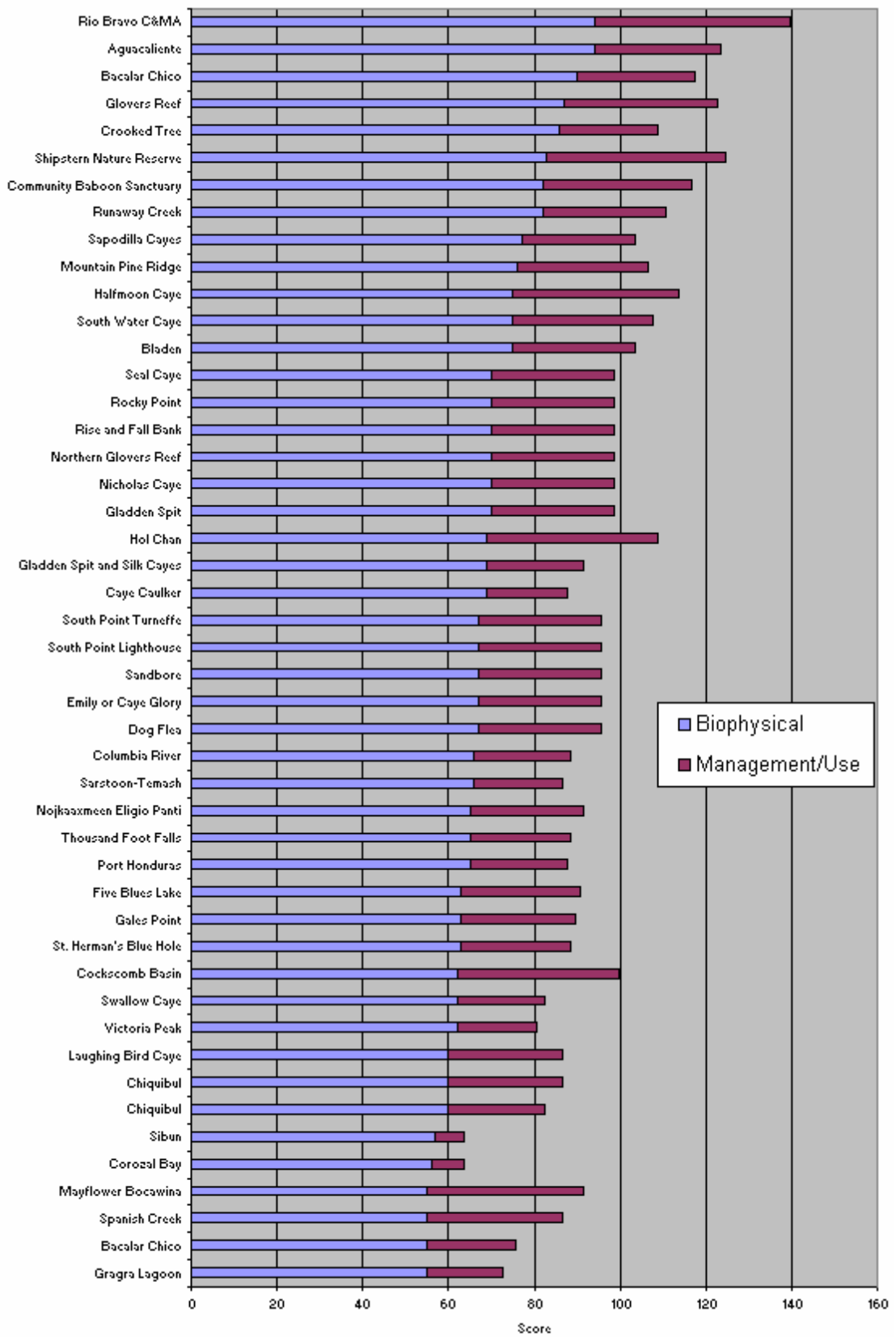
While the previous example incorporated all evaluated criteria including **management and land use characteristics**, it is possible to rank according to Biophysical values only.

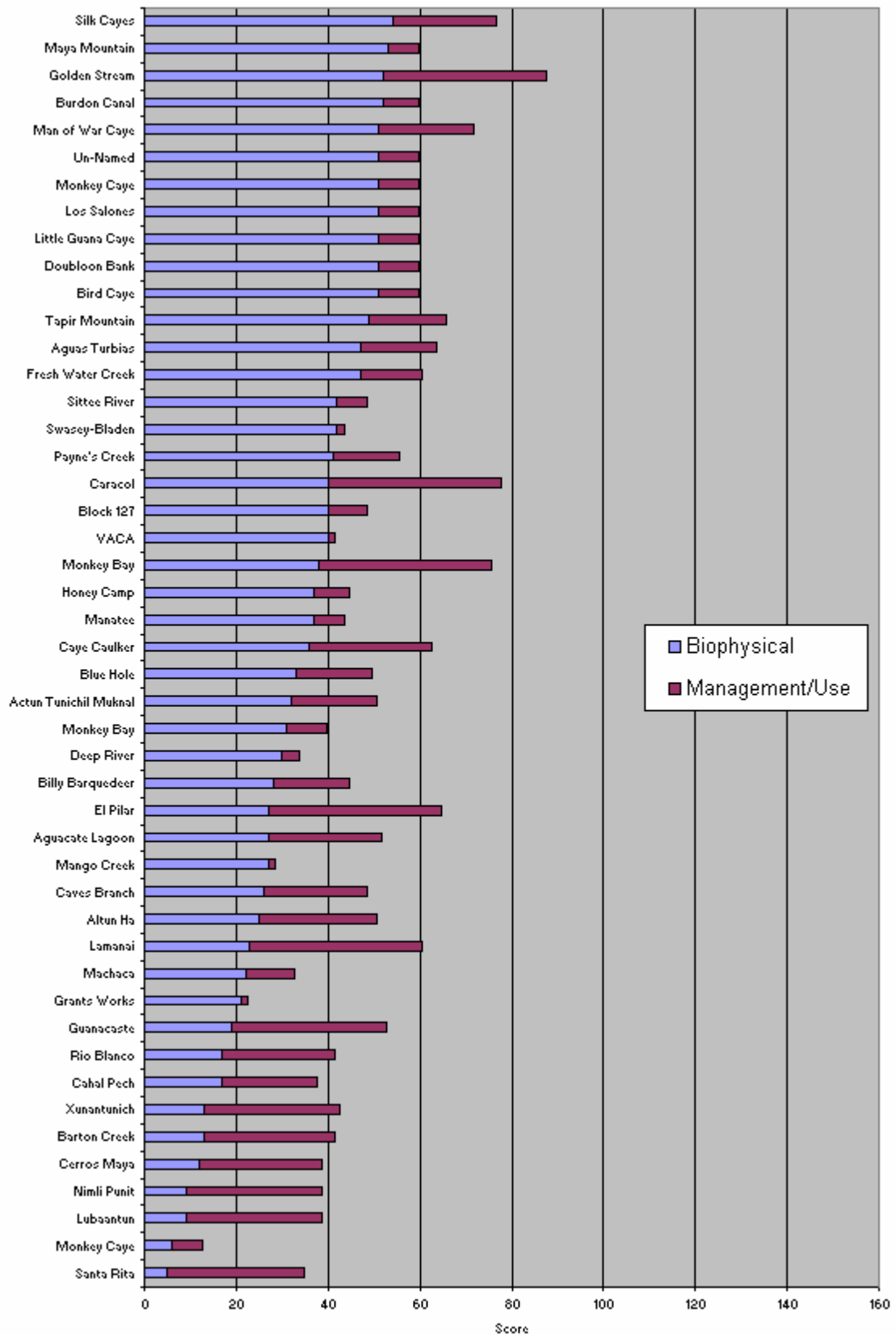
With such a ranking system interpreting the Biophysical values only, the outcome (Table 3) is somewhat similar. By this system, the top 10 most ecologically important areas in alphabetical order are:

- 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.

Notice that 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.

Table 3. Protected Areas Ranking by Biophysical values





The ranking system takes on a different interpretation when selection is on the **managements and land use criteria only** (Table 4). In this case, the top 10 protected areas are:

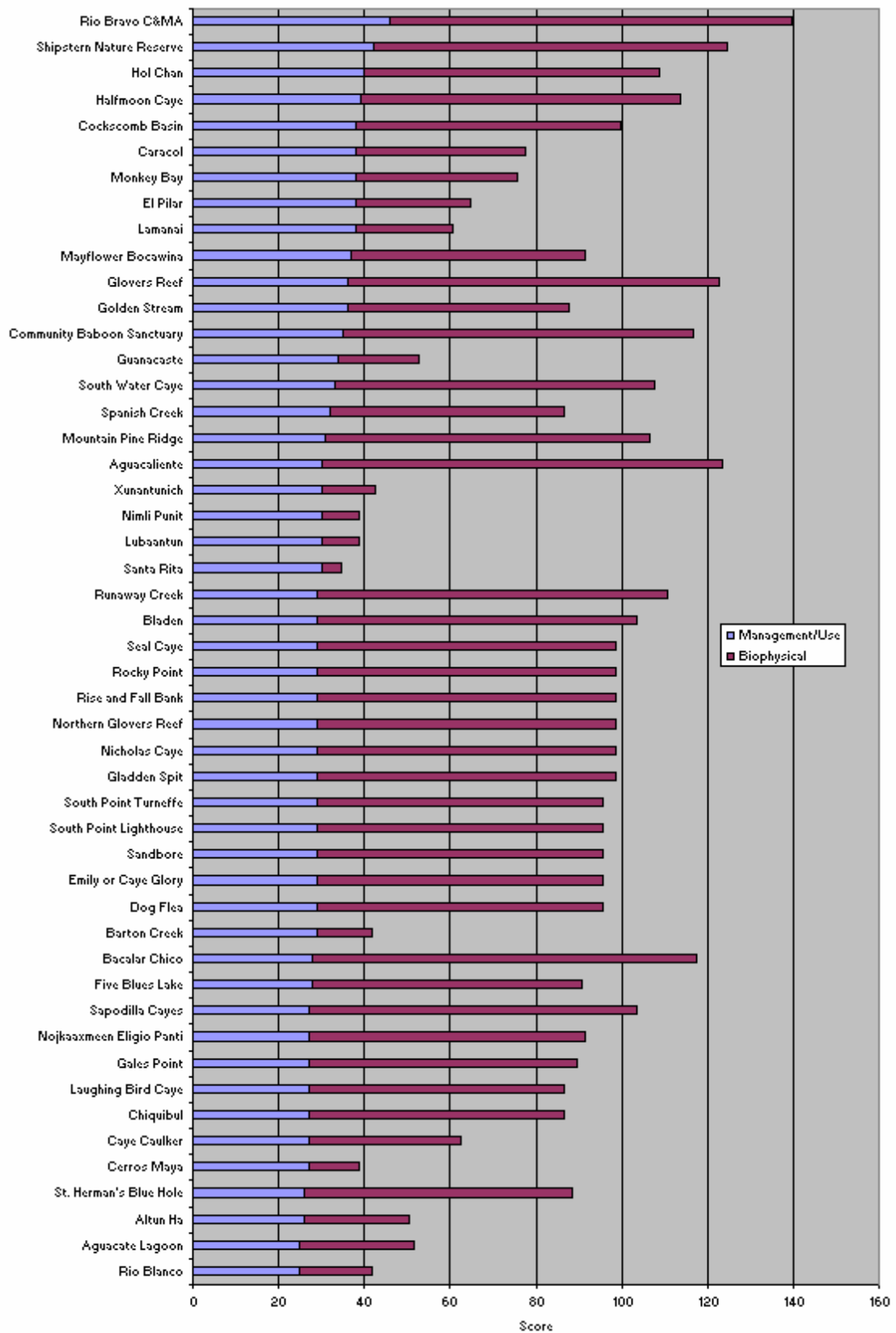
- Caracol Archaeological Reserve,
- Cockscomb Basin Wildlife Sanctuary,
- El Pilar Archaeological Reserve,
- Halfmoon Caye Natural Monument,
- Hol Chan Marine Reserve,
- Lamanai Archaeological Reserve,
- Mayflower Bocawina National Park,
- Monkey Bay Private Reserve,
- Rio Bravo Conservation and Management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

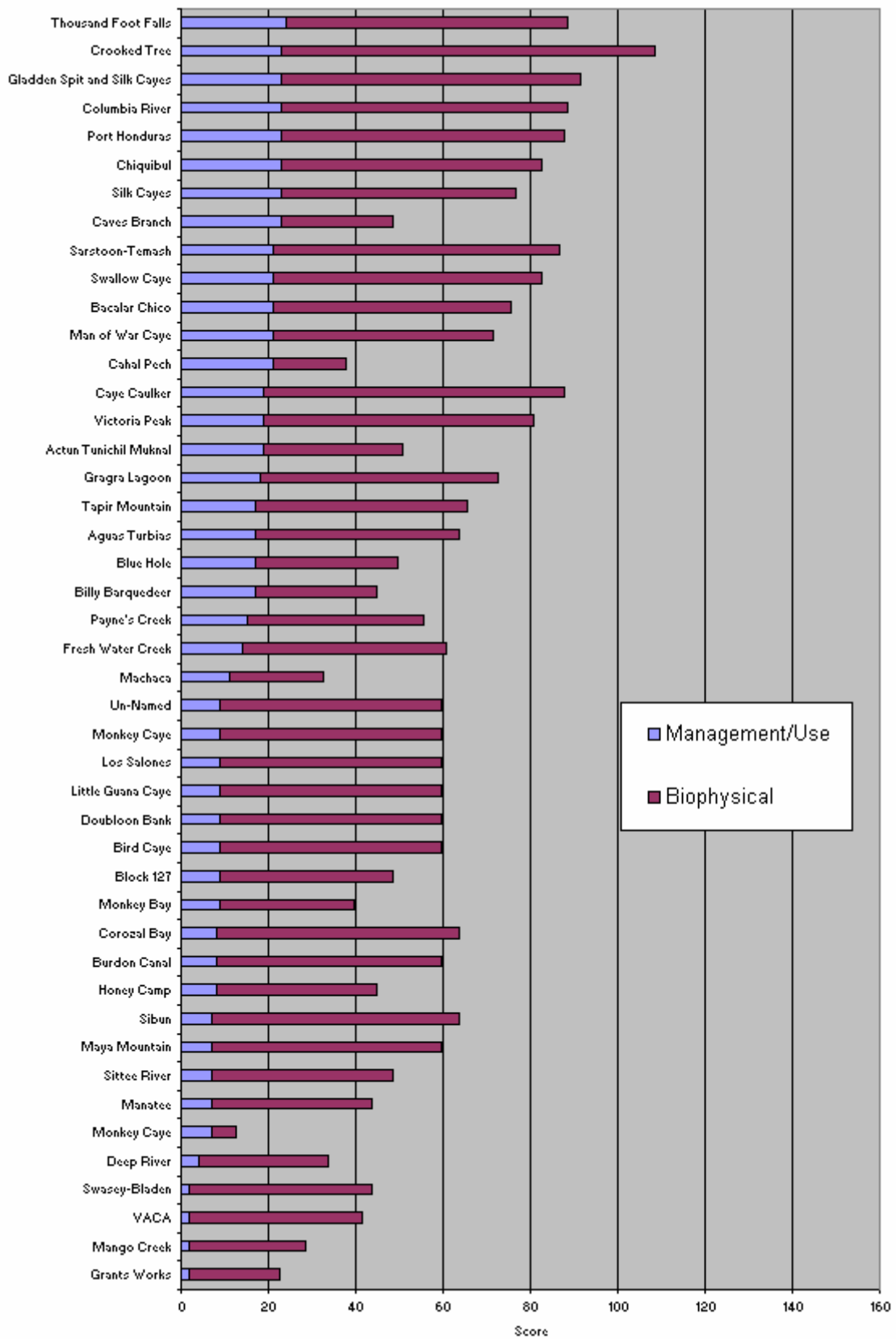
It is also worth noting that in this ranking system, several of the archaeological reserves come out high (while they came out low in the biophysical values ranking).

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.

Notice also that Rio Bravo Conservation and Management Area and Shipstern Nature Reserve always come out on top independent of the ranking system. Both are Private Reserves.

Table 4. Protected Areas Ranking by Management/Use values





Conclusions

It is worth noting that several Private Protected Areas repeatedly come out high in the various analyses. This indicates how important Private Protected Areas are for Belize's Protected Areas System.

Although size is an important factor in this analysis, the results shows that size is not all-important. Several small sites such as most of the spawning sites come out high in spite of their small size. Most archaeological reserves come out very low in this biophysical ranking system as a result of a focus on biodiversity values of the system. But when ranking according to land use and management, several of these archaeological reserves come out high.

The prioritization of the Protected Areas system in this way provides a credible way to prioritize resource allocation, both human and financial. It also pinpoints shortcomings in management activities. 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. Improving the management should improve this situation.

At some stage this site scoring effort should be repeated, preferably in a "workshop" environment involving as many protected area management agencies as possible.

The site scoring exercise should be repeated every few years in order to update the system but also as a way to monitor the effectiveness of the individual protected areas.

Protected Area Scoring System Version 4.

(12 November 2004)

The following document is a relative scoring system developed to guide protected area ranking as part of an effort to come to a comprehensive National Protected Areas System.

The scoring system consists of a questionnaire in two parts:

1. **Bio-physical Characteristics;** which values the Biological, Ecological and Physical qualities of the proposed private protected area. The resulting value reflects the intrinsic biological value of the area.
2. **Land Use Characteristics;** which reflects management and uses. The resulting value is subject to fluctuations depending on management input of the owner/managing body.

The end results are two sets of figures. They can be judged separately when there is a need to judge bio-physical and land-use characteristics separately. Conversely they can be added up to get an overall idea of the conservation value of the property.

In the case of private protected area, only properties with clear titles or long term leases (>50 years) can be considered.

The scoring system is intended to be completed by an independent committee. In the case of a private protected area this will be an committee appointed for this purpose by the Belize Association of Private Protected Areas (BAPPA).

The scoring system was developed originally for BAPPA by Jan Meerman, but later adapted to be applicable for all protected areas, including marine protected areas.

The system was tested, adapted and approved by members of both the National Protected Areas Policy and System Plan (NPAPSP) consortium and BAPPA.

Protected Areas Scoring System – Sheet 1

Bio-physical characteristics	Points	Site
Location of property		
See note below	<i>Choose only one</i> In Proposed Belize Biological Corridor Within 5 miles of proposed BBC In local Corridor (provides important linkage between ecologically valuable areas outside the BBC, in the marine area channels might provide such a function) Adjacent to other, existing protected area	10 6 6 3
Size of property		
See note below	<i>Choose only one</i> > 2000 acres 500 - 1999 acres 100 - 499 acres 20 - 199 acres < 20 acres	15 12 8 4 0
Special habitats		
See note below	<i>Choose only one. Last two choices are for Private PA's only</i> Particularly rare (< 5,000 acres in Belize) and/or threatened habitats (such as Intact Littoral Forest) Property covers habitat not or insufficiently (<10%) covered by existing National Protected Areas System (other than private). Property covers habitat that is poorly covered (10 – 20%) by existing Protected Areas System	12 8 6
Special features		
See note below	<i>More than one choice is possible</i> Important wildlife refugia/source Property includes features of high landscape/scenic value such as waterfalls, caves, cultural, historic, geological features. Property provides significant environmental services (e.g. important for watershed functioning, filtering function, buffer for sensitive areas etc)	10 5 5
State of habitat		
See note below	<i>Choose only one</i> Ecosystem intact and fully functional Partly intervened (grade according to level of disturbance) Regenerating	10 2 to 8 2
Special species		
See note below	<i>More than one choice is possible</i> Contains important breeding/nursery grounds (Bird Nesting Colonies, Iguana, Turtle, Crocodile Nesting Sites, Spawning Sites, etc) Contains important roosting sites for birds and/or critical feeding grounds Contains species endemic strictly to Belize Contains species listed as endangered (IUCN) Contains critical habitat for species listed as endangered (IUCN)	15 8 8 6 4
Total Bio-physical Characteristics		<input style="width: 100px; height: 20px;" type="text"/>
<p>Biological Corridor Note: There is no officially accepted Biological Corridor Route in Belize, But two reports indicate feasible routes: Meerman, J. C. 2000, Feasibility Study of the Proposed Northern Belize Biological Corridors Project, Herrera et al, 2002. Phase II of the characterization study: Belize National Report of the Participation Planning Process. See Biological Corridor Routes Map.</p> <p>Special Habitats Note: Based on Meerman & Sabido, 2001. Central American Ecosystems Map: Belize. See Ecosystems Map</p>		

Protected Area Scoring System – Sheet 2

Landuse characteristics			
Ownership	<i>Choose only one</i>		
	National Lands or Waters (in the case of National Protected Areas)	5	<input style="width: 100%; height: 100%;" type="text"/>
	Title (In the case of Private Protected Areas)	5	
	Long term lease	3	
	Short term lease	NA	
Information base	<i>Choose only one¹</i>		
	Extensive species inventory carried out	8	<input style="width: 100%; height: 100%;" type="text"/>
	Certain groups of organisms researched	4	
	No data available	0	
Management	<i>Choose only one¹</i>		
	Efficiently patrolled	8	<input style="width: 100%; height: 100%;" type="text"/>
	Occasionally patrolled	4	
	No management	0	
Land use Activities	<i>More than one choice is possible</i>		
	Scientific Research	8	<input style="width: 100%; height: 100%;" type="text"/>
	Strict Conservation (e.g. no-take zone)	4	
	Tourism/recreational	4	
	Active ecosystem restoration activities	4	
	Managed extraction of Timber/Non-Timber products	2	
	Managed fisheries		
	Agro-forestry	2	
	Development activities that detract from the conservation value of the property	-5	
	Hunting/fishing allowed (unmanaged)	-5	
Infrastructure	<i>More than one choice is possible</i>		
	Road Access	2	<input style="width: 100%; height: 100%;" type="text"/>
	Trails	2	
	Structures for management purposes	5	
Total Landuse Characteristics			<input style="width: 100%; height: 100%;" type="text"/>
Total of Bio-physical Characteristics (Previous Page)			<input style="width: 100%; height: 100%;" type="text"/>
Total of Landuse and Biophysical Characteristics combined			<input style="width: 100%; height: 100%;" type="text"/>
<p>¹ Some ranking is possible based on intensity or level of importance. E.g. if you feel that, yes species inventories have been carried out, it is more than a bit, but hardly extensive, choose a 6. Same for management.</p> <p style="text-align: center;">Note the scoring is subject to vetting by an independent committee.</p>			