Supplemental Information for the Brown Pelican

Biological Status Review Report

The following pages contain peer reviews received from selected peer reviewers, comments received during the public comment period, and the draft report that was reviewed before the final report was completed

March 31, 2011

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Peer review #1 from Betty Anne Schreiber

From: SchreiberE@aol.com
To: Imperiled
Subject: Re: Brown pelican Draft BSR Report
Date: Thursday, December 23, 2010 11:13:58 AM
Review of Florida brown pelican delisting.
From: Betty Anne Schreiber December 22, 2010

I could not access the web site to look at the data available there. If you are proposing delisting in Florida based on the subspecies population size, then I agree with that decision. If you are proposing delisting based on the Florida population size and health then I believe some more study is needed before making that decision. The data presented in the report are not sufficient for me to determine what the status of the population in Florida is. If the recent decline (Figure 1 andAppendix 2) in the number of nests continues, there is cause for concern about the future of the population.

Given the apparent recent decline in numbers of nests, I strongly recommend 3-4 years of colony surveys for the whole state where 3 surveys are done each year during the breeding season. If censusing has been done in the past by plane, the general census could be done that way, but it would need to be accompanied by visits to approximately 30% of the nesting sites to both reconfirm the aerial census numbers and to monitor nest success. Searches should be done in the colonies surveyed on foot for mortality from human causes (fishing line, oil, etc.).

I have several questions which are not answered in the report:

How many colonies are there and what are the numbers of breeding pairs and the trends in each? Reference is made to a 'snapshot surveys' and that the entire population was not censused, which makes an evaluation of their status very difficult.

What is the nesting success of the existing colonies? I know there is a tremendous amount of human disturbance in some breeding areas in Florida. Are chicks getting successfully raised? Are there juveniles and subadults in the population?

Are there protected roosting sites that birds can use to rest and preen (considered essential: Rodger et al. 1996) or are they constantly disturbed by boaters (as is the case in much of Charlotte Harbor)?

What are the known threats to the birds? How many are killed by unnatural causes each year such as monofilament line? Is this changing over time?

On page 1 the report states that the breeding population size in Fla. is about 9000 pairs on average and has been stable since the 1980s. But 2 reports included from local surveys of colonies had a 50% decline in the number of breeding pairs over the last 10 years.

The number given in the Table of Criteria, an estimated 10,000-12,000 breeding adults (5,000

– 6,000 pairs) does not agree with the above figure. Additionally, Figure 1 shows the more recent population to be around 5,000 pairs.

To make a reasonable determination of the status of brown pelicans in Florida, more data are badly needed.

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E. A. Schreiber, Ph.D.

Peer review #2 from Dr. Patrick Jodice

From: Patrick Jodice [mailto:PJODICE@clemson.edu]
Sent: Sunday, February 13, 2011 12:00 PM
To: Brush, Janell
Subject: RE: Brown pelican Draft BSR Report

Hi janell

Sorry for the delay. Please look over this brief response and let me know if it is helpful or if you would
like anything else specifically addressed.

Hope all is well
pat

Patrick Jodice, Ph.D.
Leader, South Carolina Cooperative Fish & Wildlife Research Unit
Associate Professor
Clemson University
Clemson, SC 29643, USA

Population status and trends
Change 'Florida is home to' to 'Florida supports'
Provide min and max along with mean (last sentence).
I think there should be some mention of status and trends in adjacent regions such as GA and SC on the Atlantic and the northern Gulf coast. It is unclear how pelican metapopulations are structured and therefore at least a cursory mention of adjacent regions seems prudent.

Geographic range and distribution
Update the northward end of breeding to reflect MD and VA colonies.
Change second sentence to: '…preferring coastal and inshore waters, estuaries, and bays.' As it is currently written it seems that they only prefer estuaries and bays.

Threats – add sea-level rise.
The sentence starting 'Nesting and loafing habitats…' is vague as written, particularly 'essential to the continuation of BRPE in FL at the levels that have existed in the past'. Also, for what nearshore seabirds would loafing and nesting habitat not be essential?
It is not clear how water management activities could affect pelicans unless they are nesting or loafing in managed impoundments?

Criterion/Listing measure
A a.2 data information – what is the unit for -8.80? Throughout (A)did you consider conducting these analyses separately for the Gulf and Atlantic colonies?

Figure 1

In the past 10 years the average number of breeding pairs (ca. 9000 prs) has been achieved only once and in the past 20 years perhaps 5 times. To me this makes it seem like the mean is somewhat misleading, perhaps being overly influenced by two years in the mid to late 80s, and not really a good representative value to use. Furthermore the decline in breeding pairs since the mid 90s is steep and consistent and as such deserves additional attention. I do not think that decline can be easily dismissed especially given recent declines in GA, SC, and in the spill area. Similar comments apply to figure 2. I understand that the requirement here is a decline over 3 generations. From 2007 we need 9 more years of data to get to a third generation. If the current trend continues FL will have < 2500 nests by then. This seems deserving of mention.

I also do not necessarily agree with the use of the term fluctuation to apply to this trend (i.e., data from 1970 to current). A fluctuation would show multiple highs and multiple lows. Your data (although smoothed) clearly show an increase (where there was some fluctuation early) followed by a change in direction and then a decrease. A change-point or segmented regression would likely show two significant trends, an increase until ca. 1990 and then a decrease (interestingly, very similar to the pattern seen in SC). Biologically I would argue that such a pattern is quite different from a truly fluctuating pattern.

Peer review #3 from Lovett Williams

From: Lovett E. Williams
To: Imperiled
Subject: Re: Out of Office: Brown pelican Draft BSR Report
Date: Monday, December 06, 2010 3:19:31 PM
Attachments: Brown Pelican Final Draft BSR 12-1-10.doc
ATT00001.txt

Caly,

I concur with the committee's conclusions.

Lovett E. Williams, Jr.
P. O. Box 870
Cedar Key, FL 32625

Peer review #4 from Patty Kelly

From: Patricia_Kelly@fws.gov
To: Imperiled
Cc: Brush, Janell; Gruver, Brad
Subject: Fw: Brown pelican Draft BSR Report
Date: Wednesday, February 16, 2011 6:07:23 PM

Review of the Brown Pelican (Pelecanus occidentalis) Biological Status Review:

I have read the "Biological Status Report for the Brown Pelican (Pelecanus occidentalis) and concur with the conclusion of the Biological Review Panel, that the brown pelican, as analyzed, using the listing criteria adopted by the FWC, does not meet the criteria needed to remain on the FWC's list as a threatened species. The information and literature cited in the biological status report is the best available to my knowledge and is summarized objectively and accurately with great conciseness. Since reports and monitoring data do show declines in local and statewide populations, the species may warrant further analysis and reconsideration for protection should the population numbers used in the criteria/listing measures show continued declines. In Northwest Florida, the four colonies occur in well known locations and are usually protected from direct human disturbances, while other threats from severe weather, sea level rise, and reduced prey, etc remain of concern. The species will continue to receive federal protection under the Migratory Bird Treaty Act-- only a protection against direct impacts. If a mechanism or process is in place for FWC to prioritize field monitoring on a routine (every 5 or 10 year basis) "at risk" species that show declines but have not reached critical levels to warrant listing, the brown pelican might warrant such treatment.

Thanks for the opportunity to comment. Patty.

Patty Kelly
Wildlife Biologist
US Fish and Wildlife Service
1601 Balboa Avenue
Panama City, FL 32405

Peer review #5 from Ann Paul

From: PAUL, Ann
To: Imperiled
Cc: WRAITHMELL, Julie
Subject: Eastern Brown Pelican BSR response
Date: Wednesday, January 26, 2011 7:50:58 PM
Attachments: Brown Pelican BSR.doc
BRPE Tampa Bay 1998-2010.xls

Please let me know if you have any questions about my response.
Thank you for the opportunity to comment.

Ann Paul
Tampa Bay Regional Coordinator
Audubon of Florida
Florida Coastal Islands Sanctuaries Program
410 South Ware Boulevard, Suite 702
Tampa, FL 33619

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813/623-6826

January 26, 2011

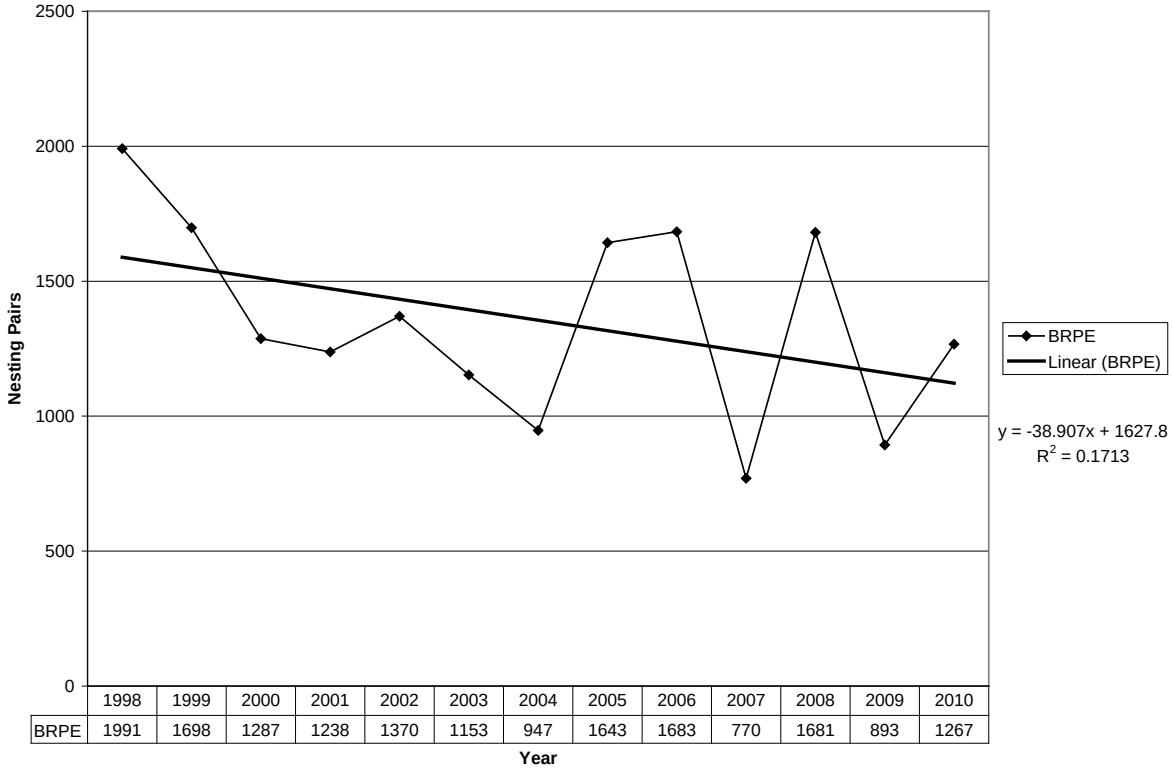
Regarding the Findings of the Biological Status Review Information, I would like to point out the following:
The population data for the Eastern Brown Pelican in Florida show a decline, although the decline is not apparently at the criterion level for listing under the newly revised criteria.
No population viability analyses have been conducted.
The average life span of an adult Brown Pelican is not known.
A Management Plan for the Eastern Brown Pelican in Florida will be written if the species is not listed by the state.

I strongly believe that the Brown Pelican is an at risk species in the state, even though they may not meet the strict new listing criteria. I base this opinion on several grounds.

Nesting sites are likely to be affected by sea level rise causing erosion and direct loss of nesting habitat, as islands become submerged. Some sites have already been lost to erosion and no longer support nesting Brown Pelicans (Citrus County Spoil Island, Passage Key NWR, and Stickney Point) while other pelican nesting colony sites are experiencing significant areal loss to erosion (Alafia Bank Bird Sanctuary, Dunedin Sand Key West).

There has been no statewide survey since 2007, but regional surveys reveal populations declines.

Florida Coastal Islands Sanctuaries Brown Pelican Surveys, 1998-2010



	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
BRPE	1991	1698	1287	1238	1370	1153	947	1643	1683	770	1681	893	1267

Brown Pelicans nest on estuarine coastal islands in the southern half of peninsular Florida. These colonies are vulnerable to disturbance by boaters and fishermen, and nesting pelicans abandon nest colony sites that have ground predators, including raccoons and other mammals. Onshore populations of raccoons and other mammalian predators are elevated by the ability of these animals to reproduce efficiently in suburban and urban human population settings. Maturing raccoons must leave the natal territories dominated by adults, and some can reach estuary islands regularly. Brown Pelican nesting colonies must be actively managed to remove predators as well as posted and patrolled to reduce human disturbance. It may be insightful to note that even with active management, some pelican colony islands suffered abandonment or partial abandonment due to the presence of raccoons [Tarpon Key NWR, Cortez Key Bird Sanctuary, Washburn Sanctuary-Terra Ceia Bird Key (or another ground predator)].

Brown Pelicans are particularly vulnerable to injury from fishing gear, and that is very likely that a major cause of mortality for fledged and adult birds.

Reproductive productivity (chicks produced per nesting attempt) is generally low, at the level of one chick per nest, with the second and third young in the nest dying of starvation before fledging and with very few adult pairs capable of successfully raising more than one chick per nest attempt. It may be that overall food supply for pelicans is declining in the Gulf of Mexico and Caribbean due to global warming affecting fish stocks (Hohn et al.).

Although I am not familiar with Brown Pelican nesting efforts everywhere in Florida, in addition to the decline in the regional population pointed out in the chart and graph above, I thought it would be useful to compare nesting data from surveys conducted by the Wildlife Commission in the past, with surveys conducted by Audubon's Florida Coastal Islands Sanctuaries staff in Spring 2010, for the same islands.

(NAS = National Audubon Society managed Sanctuary)

Bird Colony	**County**	**Colony Number, Runde et al.**	**Comment**	**1968-1990, Nesbitt et al.**	**1991-2000, Nesbitt et al.**	**2002, Nesbitt et al.**	**Spring 2010 Audubon Survey Results/direct count survey of nesting pairs**
Citrus County Spoil Island	Citrus	611172	Colony site abandoned, eroded	100	0	0	0
St. Martins Aquatic Preserve Mullet Key/Sandy Hook	Citrus		High boater disturbance	0	19	12	0
St. Martins	Citrus	611001	Colony not	51	0	0	10

Aquatic Preserve Bird Keys (south of Sandy Hook)			identified as supporting Brown Pelicans by Runde et al. 1991				
Anclote River	Pasco		Colony not identified as supporting Brown Pelicans by Runde et al. 1991	17	0	0	0
Kramer Bayou	Pinellas	611159	not in Nesbitt et al.				0
Dunedin Sand Key West	Pinellas	611027	NAS	75	56	0	35
Ozona Spoil East	Pinellas	611167	not in Nesbitt et al., NAS				0
I-25 Bird Island, Clearwater Pass	Pinellas	615131	Colony not identified as supporting Brown Pelicans by Runde et al. 1991, NAS	0	156	250	73
Belleair Beach	Pinellas	615029	not in Nesbitt et al.				101
Indian Rocks Beach	Pinellas		Colony abandoned due to raccoon presence, NAS	95	123	180	0
Johns Pass	Pinellas	615030	Colony abandoned due to raccoon presence	89	156	0	0
Johns Pass Dogleg Key	Pinellas		Site not identified as a bird	0	100	175	142

			colony by Runde et al. 1991, NAS				
Don Cesar Bird Island	Pinellas		Site not identified as a bird colony by Runde et al. 1991, not in Nesbitt et al.				27
Tarpon Key NWR	Pinellas	615031	Colony abandoned due to raccoon presence since 2003	743	556	425	0
Little Bayou	Pinellas		NAS	0	0	0	0
Coffeepot Bayou Bird Sanctuary	Pinellas		Site not identified as a bird colony by Runde et al. 1991	0	46	100	108
Egmont Key NWR/State Park	Hillsborough		Site not identified as a bird colony by Runde et al. 1991	0	110	0	468
Lake Thonotosassa	Hillsborough	611169	Audubon did not survey this bird colony, not in Nesbitt et al.				nd
Alafia Bank Bird Sanctuary	Hillsborough	615007	NAS	467	627	650	288
Cortez Key Bird Sanctuary	Manatee	615023	Audubon removed 3 raccoons in winter/spring 2010, NAS	420	268	225	37

Nina Griffith Washburn Sanctuary, Bird Key Terra Ceia	Manatee	615027	Unknown problem, suspect ground predator, NAS	230	142	175	19
Dot Dash Bird Island, Ayres Point	Manatee	615113	Pelicans do not nest on this colony, NAS	19	46	0	0
Sneeds Point	Manatee			0	0	0	0
Midnight Pass	Sarasota	615041	Colony abandoned				0
Roberts Bay Bird Islands	Sarasota	615044	NAS	199	266	275	196
Osprey	Sarasota		Colony abandoned	74	45	0	0
Blackburn Bay Marker 30	Sarasota		Site not identified as a bird colony by Runde et al. 1991, not in Nesbitt et al., NAS				29
Blackburn Bay Marker 16	Sarasota	615124	Colony not identified as supporting Brown Pelicans by Runde et al. 1991, NAS	0	38	50	13
Total Nesting Pairs							1546

There are 67 nesting sites for Brown Pelicans in Florida reported in Runde et al. 1991, including 17 on the central Florida Gulf Coast (Citrus -1, Pinellas - 6, Hillsborough - 2, Manatee - 3, Sarasota -2) and 19 noted in Nesbitt et al 2002 (Citrus County - 3, Pasco County - 1, Pinellas County - 9, Hillsborough County -2, Manatee County 4, Sarasota County – 5) in an area that has regularly surveyed by Audubon's Florida Coastal Islands Sanctuaries.

Brown Pelicans nest at 14 sites in this region. Of the sites used by Brown Pelicans in the Runde et al and Nesbitt et al. reports, 6 have been abandoned entirely (Citrus County Spoil Island,

Mullet Key-Sandy Hook, Anclote River, Indian Rocks Beach, Johns Pass, Tarpon Key NWR, Sneeds Point, Midnight Pass, and Osprey) and 3 are no longer used by pelicans (Kramer Bayou, Ozona Spoil East, and Dot Dash-Ayres Point). Eight sites were used as nesting colonies by pelicans in 2010 but were not listed by Runde et al. as used by pelicans or in some cases as bird colonies at all (St. Martins Bird Keys, Clearwater Harbor I-25 Bird Colony, Dogleg Key, Don Cesar Bird Island, Coffeepot Bayou Bird Sanctuary, Egmont Key NWR/State Park, and Blackburn Bay Markers 30 and 16. Sites identified by Runde et al. and/or Nesbitt et al. still in use are St. Martins Marsh Bird Keys, Dunedin Sand Key West, Clearwater Harbor I-25 – Pass, Belleair Beach Bird Islands, Dogleg Key, Coffeepot Bayou, Egmont Key NWR, Alafia Bank, Washburn Sanctuary – Terra Ceia Bird Key, Cortez Key, Roberts Bay, and Blackburn Bay.

Audubon's Florida Coastal Islands Sanctuaries has been actively managing colonies used by colonial waterbirds including Brown Pelicans since 1934. Colonies used by nesting Brown Pelicans that were managed by Audubon in 2010 included Dunedin Sand Key West, Clearwater Harbor Bird Island I-25, Dogleg Key, Little Bayou, Alafia Bank Bird Sanctuary, Cortez Key Bird Sanctuary, Washburn Sanctuary-Terra Ceia Bird Key, Roberts Bay Bird Islands, and Blackburn Bay Markers 30 and 16.

This points out several important facts, including
Brown Pelicans will use nesting sites year after year if ground predators are not present and if human disturbance is minimal.
If raccoons or other predators are present at a colony site, pelicans abandon it.
Pelicans will select alternate sites if the new sites meet nesting criteria: no ground predators, minimal human disturbance, near an estuary or Gulf fishery.
The Audubon Spring 2010 survey shows significant decline in the Brown Pelican nesting population in the west central Florida area compared with FFWCC surveys conducted in the past.

Oil spills in the Gulf of Mexico and other stochastic events as significant hurricanes or tropical storms may affect regional populations of Brown Pelicans, nesting success, and survival of nestlings, immature birds, or adults, especially if they occur during the nesting season when birds are particularly vulnerable. In the coastal estuary affected by Hurricane Charley in August 2004, mangrove nesting substrate for Brown Pelicans was smashed and flattened, and some sites previously used by pelicans were not used after the hurricane (Broken Islands).

Please feel free to contact me if you have questions about this response to the Eastern Brown Pelican BSR.

Ann Paul
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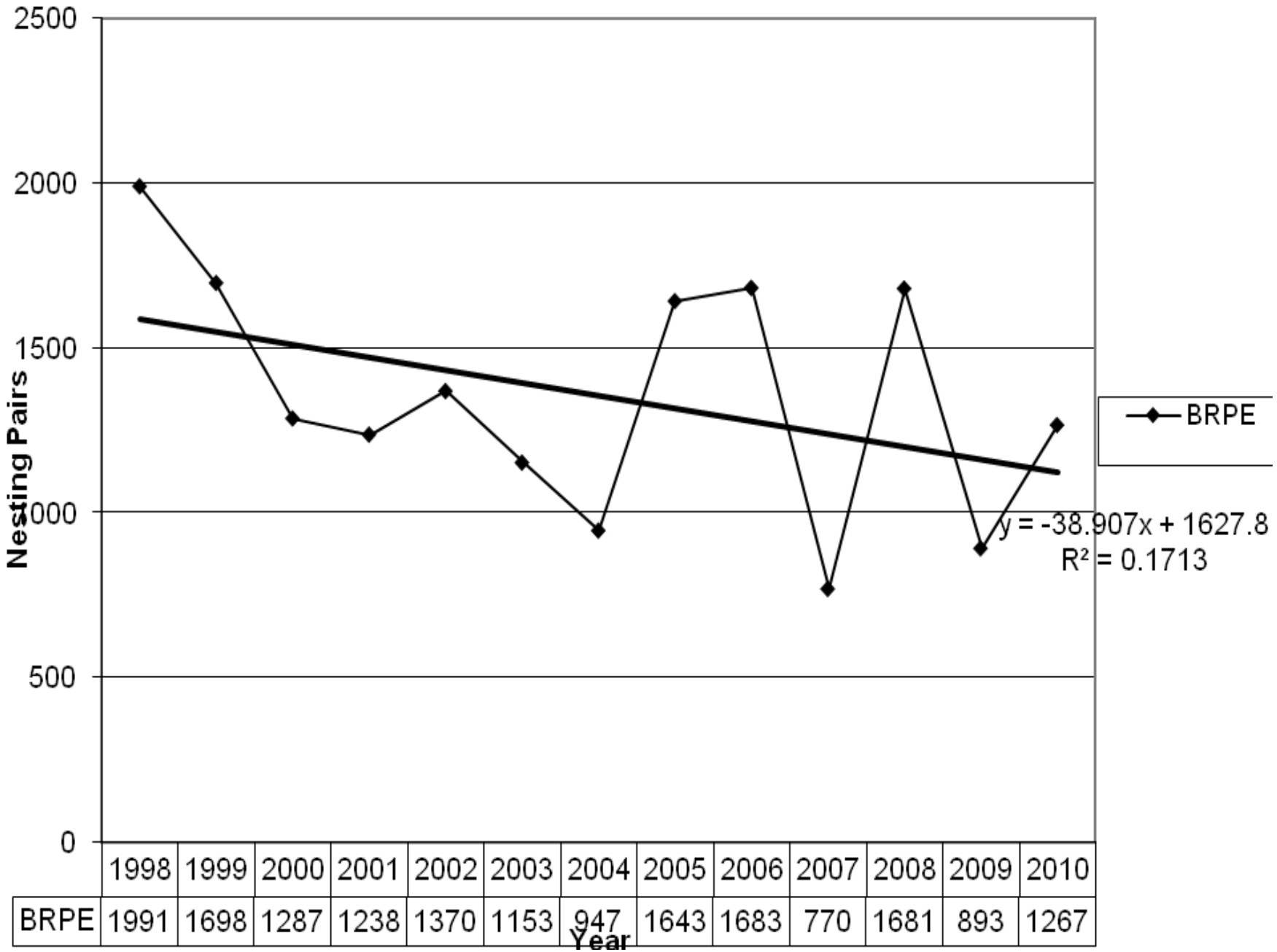
	St. Joseph Sound Marker 26	Dunedin Sand Key West	I-25	Belleair Beach	Indian Rocks Beach	Dogleg Key	Don Cesar Colony	Little Bird Key NWR	Tarpon and Whale Keys NWR	Little Bayou Island	Coffeepot Island/Bayou	Alligator Lake	Egmont Key	Alafia Bank	Wood Lake/Somerset Lake	Passage Key	Washburn Sanctuary	Washburn Jr.	TOTAL
1998		50	156	99	22	140			360		61			643		326	134		**1991**
1999			120	92	22	117			345		60			650		214	78		**1698**
2000		54	148	98	10	109			275		26		108	397			62		**1287**
2001		40	99	94	1	143			143		56		340	310			12		**1238**
2002			174	105		201			221		104			535			19	11	**1370**
2003		25	97	130	0	147		148			67		30	310		132	50	17	**1153**
2004		32	42	114		119	42			32	76		125	310				55	**947**
2005	5	43	111	110		187		58		10	88	1	626	304		12		88	**1643**
2006		25	150	96	3	142		103		10	83		600	414				57	**1683**
2007		25	32	76		82		20		8	100		210	125				92	**770**
2008	2	38	46	79	0	121		0	0	21	90	0	942	322	2	0	0	18	**1681**
2009	0	35	64	91	0	130	NS	0	0	NS	82	0	300	150	1	0	0	40	**893**
2010	0	35	73	101	0	142	27	0	0	0	108	0	468	288	6	0	19	0	**1267**



	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
BRPE	1991	1698	1287	1238	1370	1153	947	1643	1683	770	1681	893	1267

Letters and emails received during the solicitation of information from the public period of September 17 through November 1, 2010

Email from Joseph Paeglow

From: joeednp@aol.com
To: Imperiled
Subject: Brown Pelican
Date: Tuesday, October 19, 2010 11:08:20 AM

For many years my wife and I await the arrival of the 30=35 brown pelicans that roost and spend their days in the trees across from our home on the Orange River in Lee County. However we have noticed the gradual decline in the flock every year for about the last five years. Last year the flock was down to 15 with about two young birds. The flock has not arrived as of this date so I have no numbers yet.

Hope this is helpful.

Joseph W. Paeglow

Email from Ann Hodgson

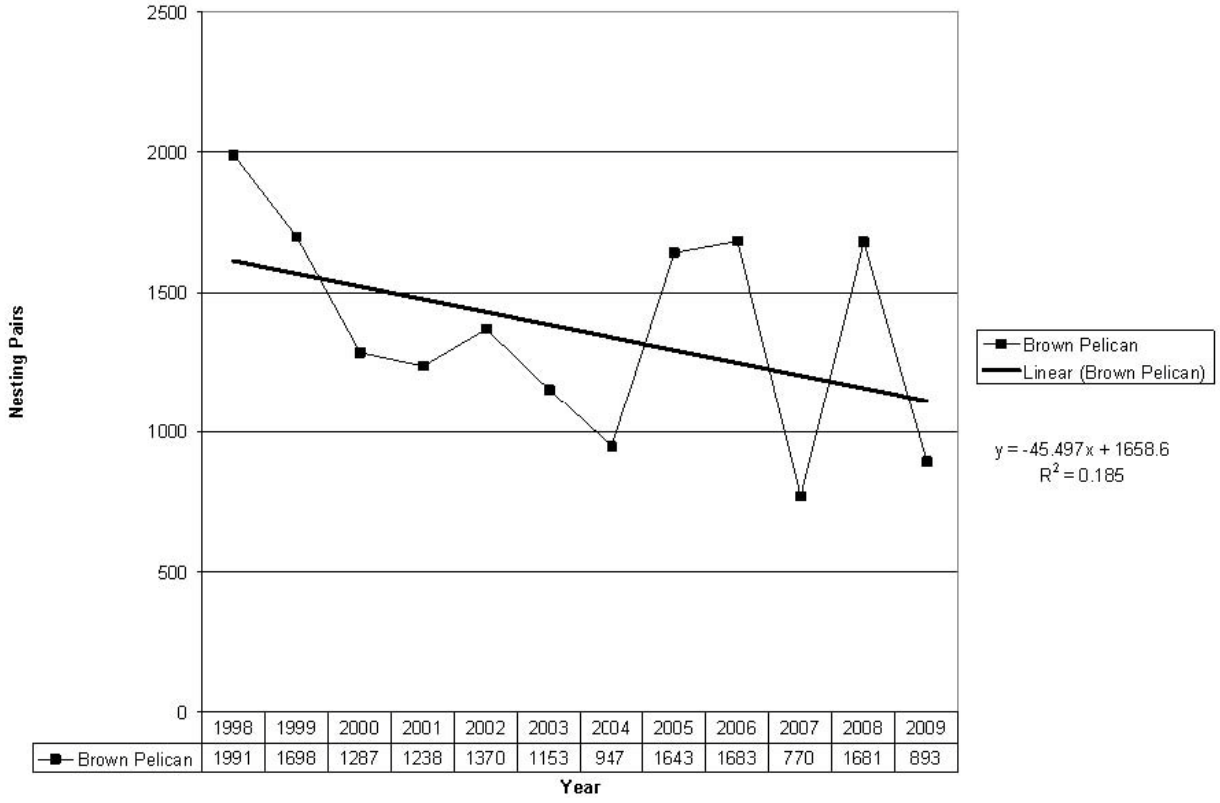
From: HODGSON, Ann
To: Imperiled
Cc: WRAITHMELL, Julie; PAUL, Ann
Subject: FW: BRPE trend data
Date: Monday, November 01, 2010 2:16:17 PM

The number of nesting pairs of Brown Pelican has decreased 55.2% between 1998-2009, years for which Florida Coastal Islands Sanctuaries and its managment partners have consistent survey effort among colonies with pelicans. We estimated the number of birds at Dogleg Key and Dunedin Sand Key West in 2009 by averaging 2008 and 2010 nesting data for each site. Little Bayou was not surveyed in 2009; at Little Bayou, there were 21 pairs in 2008 and 0 pairs in 2010. This colony has included pelicans and mixed Great Egrets and small herons, but is about 50 m from the residential seawall, and may collapse entirely from local predator pressure in the future.

Please call me or Ann Paul, Brown Pelican peer reviewer, with any questions.

best, Ann
Ann B. Hodgson, Ph. D., P.W. S.
Gulf Coast Ecosystem Science Coordinator
Audubon of Florida
Florida Coastal Islands Sanctuaries Program
410 Ware Blvd., STE 702
Tampa, FL 33619

From: RACHAL, Mark
Sent: Monday, November 01, 2010 2:06 PM
To: HODGSON, Ann
Subject: BRPE trend data



Mark Rachal
Field Biologist
Audubon of Florida
Florida Coastal Islands Sanctuaries Program
410 Ware Blvd., Suite 702
Tampa, FL 33619

Email from Neil Langenberg

Florida's Imperiled Species – Biological Status Review

Department of Environmental Protection
Coastal and Aquatic Managed Areas
Charlotte Harbor Aquatic Preserves
Punta Gorda, Florida 33955

October 14, 2010

Please find attached rookery monitoring data for the Biological Status Review regarding Florida's imperiled species requested by the Florida Fish and Wildlife Conservation Commission. Data was collected from rookery islands in 2008, 2009 and 2010 by staff from Charlotte Harbor Aquatic Preserves (CHAP) and J.N. "Ding" Darling National Wildlife Refuge (USFWS). The study area is located in southwest Florida, within Lee County, more specifically, the lower Charlotte Harbor area including Pine Island Sound Aquatic Preserve, Matlacha Pass Aquatic Preserve, and portions of J.N. Ding Darling NWR complex. Colonial bird nesting activities were documented by direct counts of active nests via boat during the breeding season. Counts reflect the maximum number or peak estimates of adults with nest by species. Data listed is only for the following imperiled species; Tricolored heron (TRHE), Little blue heron (LBHE), Snowy egret (SNEG), Reddish egret (REEG), White ibis (WHIB), and the Brown pelican (BRPE).

Neil Langenberg
Environmental Specialist
Florida Department of Environmental Protection
Charlotte Harbor Aquatic Preserves
12301 Burnt Store Rd
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941-575-5861x102

Table 1. Colonial nesting bird survey peak estimates for Pine Island Sound AP, Matlacha Pass AP and J.N "Ding" Darling NWR complex between February and August 2010.

COLONY (ISLAND)	Lat	Long	TRHE	LBHE	SNEG	REEG	WHIB	BRPE
Bodiford Key	26.4977	-82.1125	0	0	0	1	0	18
Broken Isl. N	26.6768	-82.1940	1	0	3	0	0	62
Fish Hut Island	26.5467	-82.1245	0	0	0	0	0	5
Givney Key	26.5144	-82.0552	2	0	1	0	14	1
Hemp Key	26.6004	-82.1525	8	1	2	1	0	72
Lower Bird Island	26.5125	-82.0330	0	0	2	0	0	37
N. of York Island	26.4945	-82.1043	2	0	2	0	0	8
N. E. of York Island	26.4939	-82.1021	2	0	0	0	0	0
NW of Mason Island	26.5545	-82.1252	0	0	0	0	0	2
N. W. of Pumpkin Key	26.5660	-82.1279	0	0	0	0	0	1
Skimmer Island	26.5101	-82.0250	7	0	33	2	0	72
SW of Mason Island	26.5534	-82.1249	0	0	0	0	0	1
S. W. of Pumpkin Key	26.5642	-82.1276	0	0	0	0	0	1
Tarpon Bay Keys	26.4573	-82.0745	5	0	9	0	0	34
Useppa Oyster Bar	26.6522	-82.2144	9	1	1	3	0	100
TOTAL			36	2	53	7	14	414

Table 2. Colonial nesting bird survey peak estimates for Pine Island Sound AP, Matlacha Pass AP and J.N "Ding" Darling NWR complex between March and July 2009.

COLONY (ISLAND)	Lat	Long	TRHE	LBHE	SNEG	REEG	WHIB	BRPE
Bodiford Key	26.4977	-82.1125	0	0	0	0	0	6
Broken Isl. E	26.6782	-82.1920	0	0	0	0	0	1
Broken Isl. N	26.6768	-82.1940	1	0	1	1	0	10
BrokenIsl. S	26.6741	-82.1944	2	0	1	0	0	60
Givney Key	26.5144	-82.0552	0	0	0	0	108	2
Hemp Key	26.6004	-82.1525	5	0	0	0	0	56
Lumpkin Island	26.6015	-82.0526	2	1	1	0	0	1
N. of York Island	26.4945	-82.1043	3	0	3	1	1	0
Skimmer Island	26.5101	-82.0250	0	1	0	1	0	44
Tarpon Bay Keys	26.4573	-82.0745	7	5	8	5	0	40
Useppa Oyster Bar	26.6522	-82.2144	1	0	0	0	0	0
TOTAL			21	7	14	8	109	220

Table 3. Colonial nesting bird survey peak estimates for Pine Island Sound AP, Matlacha Pass AP and J.N "Ding" Darling NWR complex between March and July 2008.

COLONY (ISLAND)	Lat	Long	TRHE	LBHE	SNEG	REEG	WHIB	BRPE
Broken Isl.E	26.6782	-82.192	0	0	0	1	0	30
Broken Isl. N	26.6768	-82.1940	1	1	2	0	4	16
Broken Isl. S	26.6741	-82.1944	0	2	1	2	0	92
Crescent Island	26.5978	-82.0637	0	0	0	0	0	7
Givney Key	26.5144	-82.0552	6	4	4	0	201	9
Hemp Key	26.6004	-82.1525	14	3	2	4	0	153
Lower Bird Island	26.5125	-82.0330	0	0	0	0	0	37
Lumpkin Island	26.6015	-82.0526	15	10	5	1	0	0
Skimmer Island	26.5101	-82.0250	2	1	2	0	0	35
Tarpon Bay Keys	26.4573	-82.0745	8	14	13	3	10	32
TOTAL			46	35	29	11	215	411

Email from Ann Hodgson

From: HODGSON, Ann
To: Imperiled
Cc: WRAITHMELL, Julie
Subject: Status of colonial waterbird populations in the Tampa Bay area from 1984-2009
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Attachments: Hodgson-twenty_five_years-06-21-10.pdf

Attached is our recent report:

TWENTY-FIVE YEARS AFTER BASIS: AN UPDATE ON THE CURRENT STATUS AND RECENT TRENDS OF COLONIAL WATERBIRD POPULATIONS IN TAMPA BAY

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Representatives of 4 orders dominate the avifauna of Tampa Bay: pelecaniformes (pelicans, cormorants, anhingas); ciconiiformes (herons, ibis, spoonbills, storks); anseriformes (waterfowl); and charadriiformes (shorebirds, gulls, and terns). The first bay-wide assessment of colonial waterbird populations was presented at BASIS by Paul and Woolfenden (1985). Twelve of the 22 colonies they reported have been abandoned since due to various causes of habitat loss or disturbance and c. 59,000 pairs (mostly Laughing Gulls) nested on 5 colonies that no longer support very large populations. After 1985, 50 new colonies became active, including 15 inland colonies, of which 16 were abandoned later. Using annual breeding bird surveys, we provide recent trends in the populations of 30 bird species breeding in Tampa Bay, 13 of which receive enhanced conservation protection through their listing by federal or state agencies. The Tampa Bay breeding population totals 30,000-58,000 nesting pairs, averaging 39,000 annually. The 2009 nesting population (all species) was 58,500 at 44 colonies. Up to 50% of the total colonial waterbird nesting occurs in Hillsborough Bay; the remainder is distributed at colony sites around Tampa Bay. Human disturbance has become the most significant cause of nesting failure annually, accompanied by anthropogenically-induced predator population increases and urban development affecting the number and ecological integrity of estuarine and palustrine wetland foraging sites. We provide a suite of habitat and population management recommendations that should be implemented to conserve the bay's avifauna. Please cite the information as:

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Please call if you have further questions.

best, Ann

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ABSTRACT

Representatives of 4 orders dominate the avifauna of Tampa Bay: pelecaniformes (pelicans, cormorants, anhingas); ciconiiformes (herons, ibis, spoonbills, storks); anseriformes (waterfowl); and charadriiformes (shorebirds, gulls, and terns). The first bay-wide assessment of colonial waterbird populations was presented at BASIS by Paul and Woolfenden (1985). Twelve of the 22 colonies they reported have been abandoned since due to various causes of habitat loss or disturbance and c. 59,000 pairs (mostly Laughing Gulls) nested on 5 colonies that no longer support very large populations. After 1985, 50 new colonies became active, including 15 inland colonies, of which 16 were abandoned later. Using annual breeding bird surveys, we provide recent trends in the populations of 30 bird species breeding in Tampa Bay, 13 of which receive enhanced conservation protection through their listing by federal or state agencies. The Tampa Bay breeding population totals 30,000-58,000 nesting pairs, averaging 39,000 annually. The 2009 nesting population (all species) was 58,500 at 44 colonies. Up to 50% of the total colonial waterbird nesting occurs in Hillsborough Bay; the remainder is distributed at colony sites around Tampa Bay. The Cockroach Bay-Terra Ceia Bay, Hillsborough Bay, Johns Pass, and Lower Tampa Bay Important Bird Areas are listed by Audubon of Florida among its 100 Important Bird Areas in Florida. Lower Tampa Bay and Hillsborough Bay were designated by Birdlife International and the National Audubon Society, Inc. in 2003 and 2009, respectively, as "Important Bird Area of Global Significance". Human disturbance has become the most significant cause of nesting failure annually, accompanied by anthropogenically-induced predator population increases and urban development affecting the number and ecological integrity of estuarine and palustrine wetland foraging sites. We provide a suite of habitat and population management recommendations that should be implemented to conserve the bay's avifauna. Hodgson and Paul

INTRODUCTION

The species richness of colonial waterbirds that nest in the Tampa Bay estuarine system is unique, as many birds of temperate North America breed here, as well as some typically "tropical" birds (Reddish Egrets, Roseate Spoonbills) that do not nest further north, and some species that nest only in low numbers anywhere in Florida (Caspian, Royal, Sandwich, and Gull-billed terns) (Howell 1932, Paul and Woolfenden 1985, Paul and Schnapf 1997, Paul and Paul 2005, Hodgson, Paul and Rachal 2006).

Within Tampa Bay, colonial waterbirds (pelecaniformes [pelicans, cormorants, anhingas]; ciconiiformes [herons, ibis, spoonbills, storks]; and charadriiformes [shorebirds, gulls, and terns]) nest preferably on small islands that are off-shore, separated by open water and deep channels with tidal currents that discourage predatory mammals from swimming to them, and

have no resident mammalian predators. Large numbers of birds of many species may breed at a single site. Generally, sites occupied by larids are sparsely vegetated sand or shell beaches or dredged spoil material, while pelecaniform and ciconiiform birds nest where shrubs or trees are available (Schreiber and Schreiber 1978). Thirteen species are currently listed by the state and federal wildlife management agencies to receive elevated regulatory protection. Several other species that nest in the watershed, although not formally listed, are very rare (Willet, Wilson's Plover, Gull-billed, Caspian, Royal, and Sandwich terns) and warrant comparable protection. The importance of Tampa Bay's bird community has been widely recognized by national and international authorities. The Cockroach Bay-Terra Ceia Bay, Hillsborough Bay, Johns Pass, and Lower Tampa Bay Important Bird Areas (IBAs) are listed by Audubon of Florida among its 100 Important Bird Areas in Florida, and BirdLife International and the National Audubon Society recognized Lower Tampa Bay and Hillsborough Bay as globally-significant IBAs in 2003 and 2009, respectively.

In this paper, we briefly summarize the current status and population trends of 30 species of birds nesting in the Tampa Bay system, mostly colonial but also some territorial nesters that often select sites within a mixed species colony, review current management programs to protect them, and provide conservation recommendations to maintain stable populations in the future.

METHODS

We (Florida Coastal Islands Sanctuaries [FCIS]) surveyed colonial waterbird colonies and territorial shorebirds from 1985 to 2009 in Tampa Bay, using direct nest counts or flight line counts, and counting nesting pairs and productivity (chicks/nest) when possible (Buckley and Buckley 1976; King 1978; Erwin and Ogden 1980, Portnoy 1980; Erwin 1981, Paul et al. 2004). Laughing Gulls were censused using a circular plot technique and extrapolating nesting density among areas of similar nesting density (Patton and Hanners 1984). We added colony locations to the survey schedule as they were discovered. We also included 15 bird colonies that occur on the bay's periphery at inland locations within the Tampa Bay Estuary Program's watershed boundaries in Hillsborough, Pasco, and Polk counties, but not colonies outside the watershed in Clearwater Harbor and St. Josephs Sound, although they contribute to the regional population (Agency on Bay Management 1995). Numbers of colonies surveyed varied inter-annually contingent on colony activity, personnel, weather, and other constraints. English and scientific names follow the Check-list of North American Birds 7th edition (American Ornithologists' Union 1998) and 50th Supplement (Chesser et al. 2009).

RESULTS

In Tampa Bay, 58,424 nesting pairs of colonial birds (all species), 42.7% of which were Laughing Gulls, bred at 44 colonies in 2009 (Table 1). The 10 year (2000-2009) mean number of nesting pairs (all species) was 44,141 (SD 10,946.57), and the mean number of active colonies was 32 (SD 6.88) (Table 2).

Of the 71 colonies mapped in the Tampa Bay watershed, 22 were discussed in BASIS, of which 12 (54.5%) were abandoned ("winked out") later for various reasons (altered habitats [e.g., urban development, plant succession], predators, human disturbance) since 1985, including 5 colonies that supported most of the gull population (Figs. 1, 2, 3). In the past 25 years we located and surveyed 50 new sites undescribed in 1985; however, 16 colonies (32.0%) subsequently collapsed and were abandoned. Cumulatively, the inland colonies supported 10.0% of the regional population. Of the initial 22 colonies, all but six were islands (Paul and

Woolfenden 1985). Five were small colonies of Yellow-crowned Night-Herons or Great Blue Herons nesting high in tall oak trees or slash pines near the bay, and the last site was the shore of the Howard Frankland Causeway, where the Florida Department of Transportation planted the roadside in the early 1990s to discourage Black Skimmers from nesting and causing traffic hazards. All recently-active colonies were islands, except the Mobbly powerlines, scattered oystercatcher territories in Apollo Beach, and the Cockroach Bay borrow pit.

In 1985, the Alafia Bank Bird Sanctuary, Washburn Sanctuary, and Tarpon Key National Wildlife Refuge were the three largest mixed colonies of pelecaniforms, herons and ibis in the region. In 2009, pelicans nested at only four sites, Washburn Sanctuary had very few pairs since 2004, and Tarpon Key was abandoned in 2005, so that the three largest colonies with similar species composition were Egmont Key National Wildlife Refuge and State Park (33,700 pairs, of which 300 were pelicans and >25,000 were larids), the Richard T. Paul Alafia Bank Bird Sanctuary (10,500 pairs, only 150 pairs of pelicans), and Alligator Lake (745 pairs), which had no pelicans.

Table 1. Colony characteristics and management status of colonial waterbird colonies in Tampa Bay, Florida, USA, in 2009.

Colony Number	*Name*	Bay Segment	Taxa	Species *(n)*	Pairs *(n)*	Abandoned after 1984	New since 1984	Ownership / Management	Protected status	Regional population (%)	Active within last 5 yrs?	*Latitude*	*Longitude*
25	Dogleg Key	BCB	P, Ci	12	296		X	FDEP-AP / FCIS	Y	0.51	Y	27.8021	-82.7618
26	Johns Pass, Little Bird Key	BCB	Ci	1	2			Suncoast Seabird Sanctuary	Y	0.00	Y	27.7932	-82.7777
27	Johns Pass, Middle Bird Island	BCB	Ci	2	5			FDEP-AP	Y	0.01	Y	27.7913	-82.7739
28	Johns Pass, Eleanor Island	BCB	Ci			X		City of Treasure Island	Y	0.00	Y	27.7878	-82.7738
29	South Pasadena Marker 34	BCB	L			X	X	City of Pasadena		0.00	N	27.7431	-82.7299
30	Sunset Beach	BCB	L			X	X	City of Treasure Island	N	0.00	N	27.7391	-82.7565
31	Don CeSar Colony	BCB	P, Ci	6	50		X	Private	N	0.09	Y	27.7059	-82.7352
32	Bayway Spoil	BCB	L			X		Developed	N	0.00	N	27.7094	-82.6995
33	Indian Key NWR	BCB	Ci			X	X	USFWS NWR	Y	0.00	Y	27.7011	-82.6909
34	Little Bird Key NWR	BCB	Ci	5	16		X	USFWS NWR	Y	0.03	Y	27.6852	-82.7169
35	Cow and Calf Islands	BCB	P, Ci	2	9		X	FDEP-AP		0.02	Y	27.6856	-82.6916
36	Darling Key	BCB	P, Ci	3	17		X	FDEP-AP		0.03	Y	27.6765	-82.6813
37	Jackass Key NWR	BCB	P, Ci	4	30		X	USFWS NWR	Y	0.05	Y	27.6693	-82.7177
38	Tarpon Key NWR	BCB	P, Ci			X		USFWS NWR	Y	0.00	N	27.6666	-82.6932
39	Whale Island NWR	BCB	P, Ci			X	X	USFWS NWR	Y	0.00	N	27.6626	-82.6930
40	Shell Key County Preserve	BCB	Ch					Florida / Pinellas County	Y	0.00	Y	27.6645	-82.7445
41	Mule Key NWR	BCB	P, Ci			X	X	USFWS NWR	Y	0.00	Y	27.6619	-82.7178
42	Listen Key NWR	BCB	P, Ci			X	X	USFWS NWR	Y	0.00	N	27.6596	-82.7179
43	Sister Key	BCB	P, Ci			X	X	Florida / Pinellas County		0.00	N	27.6503	-82.7312
44	Ft. DeSoto Park	LTB	L, Ch			X	X	Pinellas County	Y	0.00	N	27.6488	-82.7433
45	Egmont Key NWR/State Park	LTB	P, Ci, Ch	10	36,521		X	USFWS NWR / Florida State Parks	Y	62.51	Y	27.5894	-82.7614

Colony Number	*Name*	Bay Segment	Taxa	Species *(n)*	Pairs *(n)*	Abandoned after 1984	New since 1984	Ownership / Management	Protected status	Regional population (%)	Active within last 5 yrs?	*Latitude*	*Longitude*
46	Little Bayou Bird Island	MTB	P, Ci	10	140		X	FDEP-AP / FCIS	Y	0.24	Y	27.7196	-82.6312
47	Coffeepot Bayou Bird Island	MTB	P, Ci	14	612		X	Private	Y	1.05	Y	27.7916	-82.6241
48	Gandy Radio Tower	OTB				X	X	Unknown	N	0.00	N	27.8772	-82.5902
49	Howard Frankland	OTB	L			X		FDOT	N	0.00	N	27.9046	-82.6335
50	Cooper's Point	OTB				X		Pinellas County / City of Clearwater	N	0.00	N	27.9730	-82.6891
51	Alligator Lake	OTB	P, Ci	12	745			City of Safety Harbor / Pinellas County	Y	1.27	Y	27.9813	-82.6990
52	Philippe Park	OTB	Ci			X		Pinellas County	N	0.00	N	28.0053	-82.6778
53	Mobbly Bay Powerlines	OTB	P	1	19		X	Progress Energy	N	0.03	Y	28.0038	-82.6677
54	Courtney Campbell Causeway	OTB	L			X	X	FDOT	N	0.00	N	27.9736	-82.5958
55	Wilson Property/Grand Hyatt	OTB	Ci			X		Private	N	0.00	N	27.9654	-82.5514
56	Sunset Park	OTB				X		City of Tampa	N	0.00	N	27.9374	-82.5201
57	Westshore	OTB				X		City of Tampa	N	0.00	N	27.9002	-82.5361
58	McKay Bay	HB				X	X	City of Tampa / TPA	Y	0.00	N	27.9371	-82.4143
59	Hooker's Point	HB				X	X	TPA	Y	0.00	N	27.9076	-82.4338
60	Tampa Port Authority Spoil Island 2D	HB	Ch	9	2,152			TPA / FCIS	Y	3.68	Y	27.8805	-82.4313
61	Fantasy Island	HB	Ch	1	1			TPA / FCIS	Y	0.00	Y	27.8683	-82.4253
62	Spoil Area C	HB	L, Ch			X	X	Mosaic	Y	0.00	N	27.8571	-82.4003
63	Richard T. Paul Alafia Bank Bird Sanctuary	HB	P, Ci, Ch	16	6,234			Mosaic / FCIS	Y	10.67	Y	27.8483	-82.4106
64	Tampa Port Authority Spoil Island 3D	HB	Ch	2	23			TPA / FCIS	Y	0.04	Y	27.8331	-82.4352

Colony Number	*Name*	Bay Segment	Taxa	Species *(n)*	Pairs *(n)*	Abandoned after 1984	New since 1984	Ownership / Management	Protected status	Regional population (%)	Active within last 5 yrs?	*Latitude*	*Longitude*
65	Port Redwing	HB	L, Ch			X	X	TPA	Y	0.00	N	27.8132	-82.3951
66	Fishhook Spoil Island	HB	Ch	2	13			TPA / TECO	Y	0.02	Y	27.8024	-82.4152
67	Apollo Beach Oystercatchers	HB	Ch	2	15		X	Private	N	0.03	Y	27.7733	-82.4318
68	Mouth of Little Manatee River	MR	P, Ci			X		FDEP Cockroach Bay Aquatic Preserve	N	0.00	N	27.7160	-82.4823
69	Cockroach Bay Preserve	MTB	Ch	1	30		X	ELAPP	Y	0.05	Y	27.6955	-82.5079
70	Hole in the Wall, Cockroach Bay Preserve 1	MTB	Ci				X	ELAPP	Y	0.02	Y	27.6811	-82.5183
71	Hole in the Wall, Cockroach Bay Preserve 2	MTB	Ci	1	20		X	ELAPP	Y	0.02	Y	27.6799	-82.5198
72	Hole in the Wall, Cockroach Bay Preserve 3	MTB	Ci				X	ELAPP	Y	0.02	Y	27.6764	-82.5169
73	Piney Point	MTB	P, Ci	14	2,795		X	SWFWMD	Y	4.78	Y	27.6505	-82.5462
74	Manbirtee Key	MTB	Ci, Ch	4	24			MCPA / FCIS	Y	0.04	Y	27.6359	-82.5740
75	Two Brothers Island	LTB	Ci			X		Private	N	0.00	N	27.5935	-82.5847
76	Skyway Bridge Least Tern colony	LTB	L			X	X	FDOT	N	0.00	N	27.5808	-82.6090
77	Miguel Bay Colony	LTB	P, Ci				X	FDEP-AP / FCIS	Y	0.00	Y	27.5708	-82.5995
78	Passage Key	LTB	P, Ci, L, Ch			X		USFWS NWR	Y	0.00	Y	27.5545	-82.7404
79	Nina Washburn Sanctuary	TCB	P, Ci	7	52			FCIS	Y	0.09	Y	27.5527	-82.5999
80	Washburn Junior/Terra Ceia Bay Little Bird Key	TCB	P, Ci	14	407		X	FDEP Terra Ceia Aquatic Preserve / FCIS	Y	0.70	Y	27.5285	-82.6015
81	Dot Dash Dit Colony	MR	P, Ci	13	2,360			Private / Florida / FCIS	Y	4.04	Y	27.4993	-82.5243
82	Heath Yellow-crowned Night-Heron Colony	HC	Ci	1	5		X	Private	N	0.01	Y	27.8772	-82.3129
83	Office/Ferman Bird Colony	HC	P, Ci	8	74		X	Private	Y	0.13	Y	27.9448	-82.3417

Colony Number	*Name*	Bay Segment	Taxa	Species *(n)*	Pairs *(n)*	Abandoned after 1984	New since 1984	Ownership / Management	Protected status	Regional population (%)	Active within last 5 yrs?	*Latitude*	*Longitude*
84	Robles Park	HC	Ci	4	31		X	City of Tampa	Y	0.05	Y	27.9740	-82.4550
85	Corporex Colony	HC	P, Ci	7	94		X	Private	N	0.16	Y	27.9786	-82.3857
86	East Lake Island	HC	P, Ci	5	14		X	Florida Audubon Society	Y	0.02	Y	27.9922	-82.3784
87	Temple Crest/Orange Lake/Wargo Bird Colony	HC	P, Ci	8	51		X	City of Tampa / TPA	N	0.09	Y	28.0193	-82.4174
88	River Cove Yellow-crowned Night-Heron colony	HC	Ci				X	Hillsborough County	N	0.02	Y	28.0192	-82.4486
89	Citrus Park Bird Colony	HC	P, Ci	9	486		X	Private	N	0.83	Y	28.0699	-82.5834
90	Heron Point	PaC	P, Ci	7	57		X	Private	N	0.10	Y	28.2157	-82.4349
91	Saddlebrook	PaC	P, Ci	3	48		X	Private	Y	0.08	Y	28.2277	-82.3297
92	Cypress Creek Preserve	HC	P, Ci	11	3,294		X	ELAPP	Y	5.64	Y	28.1629	-82.3975
93	Cross Creek Colony	HC	P, Ci	2	8		X	Private	N	0.01	Y	28.1424	-82.3520
94	Medard County Park	HC	P, Ci	10	477		X	Hillsborough County	Y	0.82	Y	27.9218	-82.1630
95	Alafia River Corridor Preserve	HC	P, Ci	5	46		X	ELAPP	Y	0.08	Y	27.8756	-82.1053
96	Wood Lake/Somerset Lake	PoC	P, Ci	14	1,151		X	City of Lakeland / Private	Y	1.97	Y	28.0036	-81.9311
	Totals				58,424	27	48			100.00			

Taxa: P-pelecaniformes, Ci-ciconiiformes, Ch-charadriiformes, L-larids.
Values are number of species, nesting pairs, and % of 2009 regional nesting population.
Abbreviations: ELAPP – Environmental Lands Acquisition & Protection Program, FDEP-AP - Florida Department of Environmental Protection Aquatic Preserves, FDOT – Florida Department of Transportation, MCPA – Manatee County Port Authority, TPA – Tampa Port Authority, USFWS NWR - U. S. Fish & Wildlife Service National Wildlife Refuge.

Figure 1. Bird colonies in the Tampa Bay, Florida, USA, ecosystem from 1984-2009 (colonies 1-24 are excluded because they are not in the Tampa Bay watershed).

Figure 2. Bird colonies in Boca Ciega Bay, Florida, USA, from 1984-2009.

Figure 3. Bird colonies in Terra Ceia Bay, Florida, USA, from 1984-2009.

Table 2. Nesting pairs (no./species) of 30 colonial waterbirds and shorebirds and assessment of recent population trends in Tampa Bay, Florida, USA, from 2000-2009.

Species	Mean	SD	Population trend
Brown Pelican	1,024	326.15	45 is the major nesting site since 2004 when 79 and 38 collapsed; widespread also at several smaller colonies, declining
Double-crested Cormorant	455	68.48	Widely distributed at 7 sites; shifted from 79 and 38 when they collapsed; stable
Anhinga	334	93.11	Widely distributed at 7 sites; stable
Least Bittern	2	1.69	Uncommon – nesting at 4 or more freshwater sites with large cattail stands; under-surveyed
Great Blue Heron	217	61.80	Widely distributed at 10 heronries, and various misc. sites; stable
Great Egret	740	148.15	Nesting at 18 sites, >100 prs at 63, 81, 25, 47, and I-25 (Clearwater Harbor) in that order; stable
Snowy Egret	923	193.63	c. 75% decline since 1970s (Ogden 1978); stable last 10 yrs; 73 increased to 300 prs
Little Blue Heron	315	88.92	Nesting at 73, 63, and 94, and other sites, declined since 1950s with freshwater wetland loss; stable last 10 yrs
Tricolored Heron	788	178.87	Widespread at all mixed heronries; c. 60% of the population at 3 colonies: 73, 63 and 51; stable
Reddish Egret	57	21.19	Nesting at 6 sites: 63 largest group; 51 – only known freshwater site; c. 16% of state popn in Tampa Bay
Cattle Egret	4,146	2,836.85	Abundant at 63, 73, 51, 92, and 81; increasing since 1980s.
Green Heron	29	12.01	Nesting at 11 sites, notably 73, and other solitary locations; stable
Black-crowned Night-Heron	112	52.27	Nesting at the major heronries, notably 73, and inland sites; stable
Yellow-crowned Night-Heron	73	39.58	Nesting in mixed heronries; other small groups in tall coastal trees in residential areas; declining since 1980s; recent decline more rapid
White Ibis	9,180	3,464.63	Most common endemic wading bird; dependent on El Niño cycles and prey concentrated as freshwater wetlands draw down; most nesting at 63 and 73
Glossy Ibis	285	102.58	Nesting only at 63, 73, and 92; formerly approx. 50% were at 79; require shallow freshwater wetlands; stable to declining
Roseate Spoonbill	329	111.26	Exponential increase at 63 since 1975; radiated to 11 sites in the past 5 yrs; popn not stabilized
Wood Stork	212	116.93	Nesting only at 81, plus inland colonies 92, 93, 86, 95, and 89
Snowy Plover	0.4	1.26	Rarely nesting at 44, 40, 45 and usually unsuccessful due to disturbance
Wilson's Plover	25	20.68	Spottily distributed in salterns and suitable bare habitat; 74 recently important; stable; prob. under-surveyed
American Oystercatcher	91	13.58	C. 72 prs in Hillsborough Bay on spoil island shorelines (60, 63, 64, 66); the rest at widespread sites; stable, approx. 21% of state popn nests in Tampa Bay
Black-necked Stilt	32	31.35	Nesting sporadically at 60, 64, 69 around drying algae mats; rare
Willet	34	14.43	Rare and inconspicuously distributed in salt marshes and dune vegetation; under-surveyed
Laughing Gull	19,698	8,741.13	Nesting only at 60, 64 and 45; approx. 50% decline since early 1980s; Tampa Bay hosts c. 20% of entire southeast U. S. popn
Gull-billed Tern	8	5.69	A few pairs annually, often with Black Skimmers, nearly annually at 60 or 64

Species	Mean	SD	Population trend
Caspian Tern	83	10.57	Most nesting at 60, 64; formerly 63; Hillsborough Bay colony is the state's largest
Royal Tern	3,618	1,857.76	Nesting formerly at 63 and 78; now at 45 and Hillsborough Bay 60 or 64; increasing since 1990s
Sandwich Tern	811	341.14	All at 45 in 2009; formerly Hillsborough Bay (60, 64, or 63); poss. increasing
Least Tern	116	91.38	Most natural habitat lost; recently c. 80% are rooftop nesters; declining; most nesting on beaches unsuccessful due to human disturbance
Black Skimmer	406	192.24	In the last five years, skimmers nested at 60, 64, 45, 78, 40, and 29; stable, but in some years, zero nesting success

Values are mean and standard deviation of nesting pairs; see Table 1 for colony identification numbers.

DISCUSSION

Species richness (30 species) of the regional colonial waterbird population did not change in Tampa Bay from 1985 to 2009, with every endemic species and introduced Cattle Egrets represented. This community remains the largest and most significant colonial waterbird population in Florida outside of the Everglades. The Laughing Gull population has diminished by around 50% since the 1980s and is now concentrated in Hillsborough Bay and Egmont Key. These populations have persisted despite significant and continuing alteration of shoreline habitats, bay bottom, and freshwater wetlands, although recent population declines in Brown Pelicans, Laughing Gulls, Least Terns, and Snowy Plovers suggest that, as elsewhere in Florida, progressive urbanization threatens to further reduce the ecological integrity of the Tampa Bay ecosystem. Roseate Spoonbills and Reddish Egrets, extirpated as nesting species from Tampa Bay until the mid-1970s, have increased significantly, while widely expanding their distribution among suitable habitats in the bay, and Wood Stork, and Royal and Sandwich tern populations have increased slightly. The other pelecaniformes, ciconiiformes, charadriiformes and larids have remained relatively stable. The inland colonies are particularly important for small herons and Wood Storks.

Five additional species are found uniquely in coastal habitats: Clapper Rails, Mangrove Cuckoos, Gray Kingbirds, Black-whiskered Vireos, and Prairie Warblers. Clapper Rails occur in low and high marsh and require expansive areas of continuous cover, areas which are diminishing as the shoreline has been developed. Black-whiskered Vireos have virtually disappeared from Tampa Bay since c. 1991. Mangrove Cuckoos were found annually in mangroves in Boca Ciega Bay, Weedon Island, and Terra Ceia Bay in some years, but are infrequent now. Prairie Warblers are more widely distributed along Tampa Bay mangrove shorelines. Although Gray Kingbirds may also nest in uplands beyond the mangroves, all five species are primarily coastal birds whose populations have decreased in recent years. The four estuarine passerines are susceptible to nest parasitism by increasing populations of Brown-headed Cowbirds.

Paul and Woolfenden (1985) identified a number of biotic and abiotic stressors that influence bird abundance in Tampa Bay. In the decades leading up to the 1980s, coastal habitat loss dominated. In the 1990s, with the large increase in registered watercraft, the most significant issues to have emerged are anthropogenic disturbances from the increasing numbers of recreational boaters and beachgoers that: "…present a vast potential for annual disturbance of breeding birds", as predicted by Paul and Schnapf (1997:94), continued dredge and fill activities that have had both beneficial and negative effects for colonial waterbirds and beach-nesting species, continued loss of palustrine wetlands (particularly short hydroperiod and ephemeral "prairie ponds"), the trend toward reducing the spatial distribution of palustrine wetlands by condensing them into stormwater ponds and mitigation banks from the natural patterns that birds cue to throughout the landscape, and extremely high populations of meso-carnivores (raccoons, to a lesser extent opossums and, potentially, coyotes and invasive exotic herptiles).

Management Initiatives

Through site-specific management initiatives by FCIS at Audubon-owned and leased sanctuaries, Audubon's Project ColonyWatch, which engages volunteers to observe and protect colonies in cooperation with site managers, and a continuous effort to expand colony management partnerships among agencies and private landowners, most of the now active colonies have been posted, are managed during the year to control predators and remove entangling fishing line during the Tampa Bay Watch and Audubon Monofilament Cleanup, are regularly surveyed to establish colony species composition and productivity, and are intermittently patrolled. However, with the dramatic increase in public recreation on the water, this program is insufficient to fully protect most colonies. In the past five years we have also implemented a series of inter-agency workshops for law enforcement marine units about the biology, habitat requirements, and laws protecting colonial waterbirds.

Management Recommendations

Environmental education – In collaboration with land managers and management partners, continue to produce and distribute to the public boaters guides describing the bay's natural resources and protected areas, and present informational talks about the bay's avifauna. Colony management - Continue current management activities, and establish and enforce spatial buffers around colonies to prevent site disturbance. Increase enforcement of wildlife protection laws.

Habitat management - Manage existing sites to provide required habitats; the spoil islands in the Hillsborough Bay Important Bird Area support some of the largest colonies of pelicans, herons, ibis, gulls, and oystercatchers in the state. Many nesting colony sites have been abandoned and fewer new sites will be available in the future given the development density. Currently functioning sites must be carefully protected.

Habitat restoration – Continue to acquire land and restore coastal ecosystems to replace the large areas of coastal mangroves, salterns, intertidal mudflats, and freshwater wetlands that have been lost; restore tidal creeks and re-establish altered coastal drainage patterns.

Wetland protection - The loss of both coastal estuarine and inland palustrine wetlands by drainage or alteration has been a dominant cause of population declines of colonial birds regionally and statewide. Locally, habitat fragmentation, seasonal wetland draw downs, and consolidation of freshwater wetlands decreases wetland functioning in the landscape, and

reduces forage availability, which particularly affects successful nesting of White Ibis, small herons, and Wood Storks.

Sea level rise – Participate in the dialogue about climate change and potential effects of sea level rise; include in future conservation planning initiatives acquisition of lands and sites that will not be affected by increasing water levels.

Maintaining the vibrant, diverse colonial waterbird population in Tampa Bay in the future will be more challenging than during the past three decades since BASIS, and much more difficult than in the decades preceding widespread coastal development. Despite 25 years of intensive public outreach and environmental education activities by Audubon and others, sedulous volunteers in Audubon's Project ColonyWatch and in the Florida Shorebird Alliance providing colony guardianship, and expanded coordination between non-governmental, local, county, state, and federal wildlife protection programs, human disturbance is an incessant threat to the persistence of local bird colonies. More protective regulations, more enforcement, and heightened public cooperation will all be needed to protect the spectacular, charismatic bird populations of Tampa Bay.

ACKNOWLEDGMENTS

We thank the many agencies and landowners that allowed access to their lands in the bay: Chassahowitzka National Wildlife Refuge Complex/Pinellas National Wildlife Refuges, Egmont Key and Passage Key National Wildlife Refuges; Florida Department of Environmental Protection Pinellas Aquatic Preserve and Terra Ceia Aquatic Preserve; Florida Parks Department, Hillsborough County; Manatee County and Manatee County Port Authority; Mosaic; Pinellas County; Cities of Clearwater, Lakeland, Pasadena, Safety Harbor, Tampa; and Treasure Island; Southwest Florida Water Management District; Tampa Port Authority; Tampa Electric Company, and many private landowners. This research was supported in part by the National Fish and Wildlife Foundation Pinellas County Environmental Fund, the U. S. Fish & Wildlife Service Coastal Program, the Tampa Port Authority, Mosaic, and many corporate and private donors. Laura Flynn, Lewis Environmental Services, Inc., prepared the figures.

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From: HODGSON, Ann
To: Imperiled
Cc: WRAITHMELL, Julie; Rodgers, James
Subject: RE: BRPE trend data
Date: Tuesday, November 02, 2010 1:24:07 PM
Attachments: Audubon Tampa Bay colony descriptions and map.doc

The data presented below were acquired at colonial waterbird colonies throughout the Tampa Bay region (Pinellas, Hillsborough, Manatee, Sarasota, and Polk counties) during annual colonial waterbird nesting surveys conducted by Audubon of Florida's Florida Coastal Islands Sanctuaries in cooperation with land management partners, as shown on the attached table and map.

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Table 1. Colony characteristics and management status of colonial waterbird colonies in Tampa Bay, Florida, USA, in 2009.

Colony Number	*Name*	Bay Segment	Taxa	Species *(n)*	Pairs *(n)*	Abandoned after 1984	New since 1984	Ownership / Management	Protected status	Regional population (%)	Active within last 5 yrs?	*Latitude*	*Longitude*
25	Dogleg Key	BCB	P, Ci	12	296		X	FDEP-AP / FCIS	Y	0.51	Y	27.8021	-82.7618
26	Johns Pass, Little Bird Key	BCB	Ci	1	2			Suncoast Seabird Sanctuary	Y	0.00	Y	27.7932	-82.7777
27	Johns Pass, Middle Bird Island	BCB	Ci	2	5			FDEP-AP	Y	0.01	Y	27.7913	-82.7739
28	Johns Pass, Eleanor Island	BCB	Ci			X		City of Treasure Island	Y	0.00	Y	27.7878	-82.7738
29	South Pasadena Marker 34	BCB	L			X	X	City of Pasadena		0.00	N	27.7431	-82.7299
30	Sunset Beach	BCB	L			X	X	City of Treasure Island	N	0.00	N	27.7391	-82.7565
31	Don CeSar Colony	BCB	P, Ci	6	50		X	Private	N	0.09	Y	27.7059	-82.7352
32	Bayway Spoil	BCB	L			X		Developed	N	0.00	N	27.7094	-82.6995
33	Indian Key NWR	BCB	Ci			X	X	USFWS NWR	Y	0.00	Y	27.7011	-82.6909
34	Little Bird Key NWR	BCB	Ci	5	16		X	USFWS NWR	Y	0.03	Y	27.6852	-82.7169
35	Cow and Calf Islands	BCB	P, Ci	2	9		X	FDEP-AP		0.02	Y	27.6856	-82.6916
36	Darling Key	BCB	P, Ci	3	17		X	FDEP-AP		0.03	Y	27.6765	-82.6813
37	Jackass Key NWR	BCB	P, Ci	4	30		X	USFWS NWR	Y	0.05	Y	27.6693	-82.7177
38	Tarpon Key NWR	BCB	P, Ci			X		USFWS NWR	Y	0.00	N	27.6666	-82.6932
39	Whale Island NWR	BCB	P, Ci			X	X	USFWS NWR	Y	0.00	N	27.6626	-82.6930
40	Shell Key County Preserve	BCB	Ch					Florida / Pinellas County	Y	0.00	Y	27.6645	-82.7445
41	Mule Key NWR	BCB	P, Ci			X	X	USFWS NWR	Y	0.00	Y	27.6619	-82.7178
42	Listen Key NWR	BCB	P, Ci			X	X	USFWS NWR	Y	0.00	N	27.6596	-82.7179
43	Sister Key	BCB	P, Ci			X	X	Florida / Pinellas County		0.00	N	27.6503	-82.7312
44	Ft. DeSoto Park	LTB	L, Ch			X	X	Pinellas County	Y	0.00	N	27.6488	-82.7433

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Colony Number	*Name*	Bay Segment	Taxa	Species *(n)*	Pairs *(n)*	Abandoned after 1984	New since 1984	Ownership / Management	Protected status	Regional *population* (%)	Active within last 5 yrs?	*Latitude*	*Longitude*
45	Egmont Key NWR/State Park	LTB	P, Ci, Ch	10	36,521		X	USFWS NWR / Florida State Parks	Y	62.51	Y	27.5894	-82.7614
46	Little Bayou Bird Island	MTB	P, Ci	10	140		X	FDEP-AP / FCIS	Y	0.24	Y	27.7196	-82.6312
47	Coffeepot Bayou Bird Island	MTB	P, Ci	14	612		X	Private	Y	1.05	Y	27.7916	-82.6241
48	Gandy Radio Tower	OTB				X	X	Unknown	N	0.00	N	27.8772	-82.5902
49	Howard Frankland	OTB	L			X		FDOT	N	0.00	N	27.9046	-82.6335
50	Cooper's Point	OTB				X		Pinellas County / City of Clearwater	N	0.00	N	27.9730	-82.6891
51	Alligator Lake	OTB	P, Ci	12	745			City of Safety Harbor / Pinellas County	Y	1.27	Y	27.9813	-82.6990
52	Philippe Park	OTB	Ci			X		Pinellas County	N	0.00	N	28.0053	-82.6778
53	Mobbly Bay Powerlines	OTB	P	1	19		X	Progress Energy	N	0.03	Y	28.0038	-82.6677
54	Courtney Campbell Causeway	OTB	L			X	X	FDOT	N	0.00	N	27.9736	-82.5958
55	Wilson Property/Grand Hyatt	OTB	Ci			X		Private	N	0.00	N	27.9654	-82.5514
56	Sunset Park	OTB				X		City of Tampa	N	0.00	N	27.9374	-82.5201
57	Westshore	OTB				X		City of Tampa	N	0.00	N	27.9002	-82.5361
58	McKay Bay	HB				X	X	City of Tampa / TPA	Y	0.00	N	27.9371	-82.4143
59	Hooker's Point	HB				X	X	TPA	Y	0.00	N	27.9076	-82.4338
60	Tampa Port Authority Spoil Island 2D	HB	Ch	9	2,152			TPA / FCIS	Y	3.68	Y	27.8805	-82.4313
61	Fantasy Island	HB	Ch	1	1			TPA / FCIS	Y	0.00	Y	27.8683	-82.4253
62	Spoil Area C	HB	L, Ch			X	X	Mosaic	Y	0.00	N	27.8571	-82.4003

Colony Number	*Name*	Bay Segment	Taxa	Species *(n)*	Pairs *(n)*	Abandoned after 1984	New since 1984	Ownership / Management	Protected status	Regional *population* (%)	Active within last 5 yrs?	*Latitude*	*Longitude*
63	Richard T. Paul Alafia Bank Bird Sanctuary	HB	P, Ci, Ch	16	6,234			Mosaic / FCIS	Y	10.67	Y	27.8483	-82.4106
64	Tampa Port Authority Spoil Island 3D	HB	Ch	2	23			TPA / FCIS	Y	0.04	Y	27.8331	-82.4352
65	Port Redwing	HB	L, Ch			X	X	TPA	Y	0.00	N	27.8132	-82.3951
66	Fishhook Spoil Island	HB	Ch	2	13			TPA / TECO	Y	0.02	Y	27.8024	-82.4152
67	Apollo Beach Oystercatchers	HB	Ch	2	15		X	Private	N	0.03	Y	27.7733	-82.4318
68	Mouth of Little Manatee River	MR	P, Ci			X		FDEP Cockroach Bay Aquatic Preserve	N	0.00	N	27.7160	-82.4823
69	Cockroach Bay Preserve	MTB	Ch	1	30		X	ELAPP	Y	0.05	Y	27.6955	-82.5079
70	Hole in the Wall, Cockroach Bay Preserve 1	MTB	Ci				X	ELAPP	Y	0.02	Y	27.6811	-82.5183
71	Hole in the Wall, Cockroach Bay Preserve 2	MTB	Ci	1	20		X	ELAPP	Y	0.02	Y	27.6799	-82.5198
72	Hole in the Wall, Cockroach Bay Preserve 3	MTB	Ci				X	ELAPP	Y	0.02	Y	27.6764	-82.5169
73	Piney Point	MTB	P, Ci	14	2,795		X	SWFWMD	Y	4.78	Y	27.6505	-82.5462
74	Manbirtee Key	MTB	Ci, Ch	4	24			MCPA / FCIS	Y	0.04	Y	27.6359	-82.5740
75	Two Brothers Island	LTB	Ci			X		Private	N	0.00	N	27.5935	-82.5847
76	Skyway Bridge Least Tern colony	LTB	L			X	X	FDOT	N	0.00	N	27.5808	-82.6090
77	Miguel Bay Colony	LTB	P, Ci				X	FDEP-AP / FCIS	Y	0.00	Y	27.5708	-82.5995
78	Passage Key	LTB	P, Ci, L, Ch			X		USFWS NWR	Y	0.00	Y	27.5545	-82.7404
79	Nina Washburn Sanctuary	TCB	P, Ci	7	52			FCIS	Y	0.09	Y	27.5527	-82.5999
80	Washburn Junior/Terra Ceia	TCB	P, Ci	14	407		X	FDEP Terra Ceia Aquatic	Y	0.70	Y	27.5285	-82.6015

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Colony Number	*Name*	Bay Segment	Taxa	Species *(n)*	Pairs *(n)*	Abandoned after 1984	New since 1984	Ownership / Management	Protected status	Regional *population* (%)	Active within last 5 yrs?	*Latitude*	*Longitude*
	Bay Little Bird Key							Preserve / FCIS					
81	Dot Dash Dit Colony	MR	P, Ci	13	2,360			Private / Florida / FCIS	Y	4.04	Y	27.4993	-82.5243
82	Heath Yellow-crowned Night-Heron Colony	HC	Ci	1	5		X	Private	N	0.01	Y	27.8772	-82.3129
83	Office/Ferman Bird Colony	HC	P, Ci	8	74		X	Private	Y	0.13	Y	27.9448	-82.3417
84	Robles Park	HC	Ci	4	31		X	City of Tampa	Y	0.05	Y	27.9740	-82.4550
85	Corporex Colony	HC	P, Ci	7	94		X	Private	N	0.16	Y	27.9786	-82.3857
86	East Lake Island	HC	P, Ci	5	14		X	Florida Audubon Society	Y	0.02	Y	27.9922	-82.3784
87	Temple Crest/Orange Lake/Wargo Bird Colony	HC	P, Ci	8	51		X	City of Tampa / TPA	N	0.09	Y	28.0193	-82.4174
88	River Cove Yellow-crowned Night-Heron colony	HC	Ci				X	Hillsborough County	N	0.02	Y	28.0192	-82.4486
89	Citrus Park Bird Colony	HC	P, Ci	9	486		X	Private	N	0.83	Y	28.0699	-82.5834
90	Heron Point	PaC	P, Ci	7	57		X	Private	N	0.10	Y	28.2157	-82.4349
91	Saddlebrook	PaC	P, Ci	3	48		X	Private	Y	0.08	Y	28.2277	-82.3297
92	Cypress Creek Preserve	HC	P, Ci	11	3,294		X	ELAPP	Y	5.64	Y	28.1629	-82.3975
93	Cross Creek Colony	HC	P, Ci	2	8		X	Private	N	0.01	Y	28.1424	-82.3520
94	Medard County Park	HC	P, Ci	10	477		X	Hillsborough County	Y	0.82	Y	27.9218	-82.1630
95	Alafia River Corridor Preserve	HC	P, Ci	5	46		X	ELAPP	Y	0.08	Y	27.8756	-82.1053
96	Wood Lake/Somerset Lake	PoC	P, Ci	14	1,151		X	City of Lakeland / Private	Y	1.97	Y	28.0036	-81.9311
	Totals				58,424	27	48			100.00			


Pasco County
Polk County
Hillsborough County
Pinellas County
Old Tampa Bay
Hillsborough Bay
Middle Tampa Bay
Upper Boca Ciega Bay
Lower Boca Ciega Bay
Lower Tampa Bay
Terra Ceia Bay
Manatee County
Gulf of Mexico
Manatee River
N
0 5 10 Kilometers
Legend
Basis I Colonies
Post Basis I Colonies
Abandoned Colonies
Tampa Bay Watershed Basins
Audubon OF FLORIDA

Copy of the Brown Pelican BSR draft report that was sent out for peer review

Biological Status Review
For the Brown Pelican
(*Pelecanus occidentalis)*

EXECUTIVE SUMMARY

The Florida Fish and Wildlife Conservation Commission (FWC) directed staff to evaluate all species listed as Threatened or Species of Special Concern as of September 1, 2010. Public information on the status of the brown pelican was sought from September 17 to November 1, 2010. The three-member biological review group met on November 3 – 4, 2010. Group members were Janell M. Brush (FWC lead), Stephen A. Nesbitt (retired biologist, FWC) and Gary L. Sprandel (Geoprocessing Specialist, Kentucky Department of Fish and Wildlife Resources). In accordance with rule 68A-27.0012 Florida Administrative Code (F.A.C.), the Brown Pelican Biological Review Group was charged with evaluating the biological status of the brown pelican using criteria included in definitions in 68A-27.001(3) and following the protocols in the *Guidelines for Application of the IUCN Red List Criteria at Regional Levels (Version 3.0)* and *Guidelines for Using the IUCN Red List Categories and Criteria (Version 8.1)*. Please visit http://myfwc.com/WILDLIFEHABITATS/imperiledSpp_listingprocess.htm to view the listing process rule and the criteria found in the definitions.

The Biological Review Group concluded from the biological assessment that the brown pelican no longer met criteria for listing and recommend removing the species from the FWC list of threatened species.

This work was supported by a Conserve Wildlife Tag grant from the Wildlife Foundation of Florida.

BIOLOGICAL INFORMATION

Life History References – Anderson 1988; Brinkley and Humann 2001; FFWCC 2003; Nesbitt et al. 1978; Nesbitt et al. 1980; Nesbitt et al. 1981; Rodgers et. al 1996;; Schreiber and Mock 1988; Schreiber and Schreiber 1982; Shields 2002; USFWS 2007.

Taxonomic Classification – Generally, six subspecies of the brown pelican (*Pelecanus occidentalis*) are recognized. The Florida brown pelican population is included in the subspecies *P. o. carolinensis*, also referred to as the eastern brown pelican.

Population Status and Trend - The global population of brown pelicans is estimated to be at least 200,000 individuals (Shields 2002). The Southeast United States Regional Waterbird Conservation Plan (Hunter et al. 2006) determined that brown pelican populations have increased dramatically along the Gulf and Atlantic coasts of the southeastern U.S. since the population was delisted in 1985. It is estimated that nearly 40,000 pairs of *P. o. carolinensis* bred in the U.S. in 1999, with 60% occurring on the Gulf Coast (Shields 2002). Florida is home to resident, breeding brown pelicans, as well as migratory individuals. The state population

appears to have been stable since the late 1980s, although fluctuations in nesting numbers have been observed. Nesbitt et al. (2002) provide an average annual number of nesting brown pelicans between 1968 and 2001 at 9,028 pairs (±1,321 SD) statewide.

Geographic Range and Distribution – Brown pelicans are found in the western hemisphere, with breeding ranges along the Pacific coast from California to Chile, and along the Atlantic coast from the Carolinas south to Venezuela and into the West Indies. The species is not generally considered pelagic, preferring coastal and inshore water bodies such as estuaries and bays. In Florida, the species occurs along both coasts, and has been documented at a few interior locations (McNair 2000). Breeding distribution shifts have been well documented within Florida with some local populations decreasing while adjacent in-state regions have increased (Rodgers et al. 1996).

Quantitative Analyses – A population viability analysis on the Florida breeding population of brown pelicans has not been conducted.

BIOLOGICAL STATUS ASSESSMENT

Threats – The brown pelican was listed under the U.S. Endangered Species Act of 1973 following dramatic declines in their populations during the decades prior. The use of persistent organochlorine pesticides, particularly DDT/DDE, from the late 1940s to early 1970s resulted in bioaccumulation in prey fish and transfer to brown pelicans. Sub-lethal effects included thinning of egg-shells and reduced breeding productivity. Since the banning of these chemicals, and with the benefit of greater conservation efforts, the brown pelican population has responded positively. The U.S. Fish and Wildlife Service removed the endangered status for brown pelicans on the Atlantic and Gulf coasts of the U.S., including Florida, on February 4, 1985. The distinct population segment of the species that remained (including the Gulf coast in Mississippi, Louisiana, and Texas) listed following the 1985 final rule was also officially removed from the Federal List of Endangered and Threatened Wildlife on December 17, 2009 (USFWS 2009).

Despite population recovery over the past 40 years, there remain threats and concerns for the brown pelican. Examples include the potential impact of adverse weather on critical breeding areas, oiling of individuals and rookeries from oil spills, heavy metal exposure (eg. mercury, cadmium, lead), reduced prey availability (fisheries decline), degradation of coastal wetland habitat, nesting colony disturbance, and entanglement in and/or ingestion of fishing gear (Burger and Gochfeld 2002, Schreiber and Burger 2002, Shields 2002). Nesting and loafing habitats are essential to the continuation of brown pelicans in Florida at the levels that have existed in the past (Rodgers et al. 1996). Like other waterbirds, brown pelicans in Florida could also be impacted by hydrologic alterations resulting from water management activities (Hunter et al. 2006).

Statewide Population Assessment – Findings from the BRG are included in Biological Review Information Tables.

LISTING RECOMMENDATION

Staff recommends removing the brown pelican from the State-designated Threatened species list because the species does not meet criteria for listing as described in 68A-27.001(3).

SUMMARY OF THE INDEPENDENT REVIEW – this will be completed after the peer review.

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Biological Status Review Information
Findings

Species/taxon:	Brown Pelican (*Pelecanus occidentalis carolensis*)
Date:	11/04/10
Assessors:	Janell Brush, Gary Sprandel, Steve Nesbitt
Generation length:	12 years (Schreiber and Mock 1988; Shields 2002) *See Notes*

Criterion/Listing Measure	Data/Information	Data Type*	Criterion Met?	References
*Data Types - observed (O), estimated (E), inferred (I), suspected (S), or projected (P). Criterion met - yes (Y) or no (N).				
(A) Population Size Reduction, ANY of				
(a)1. An observed, estimated, inferred or suspected population size reduction of at least 50% over the last 10 years or 3 generations, whichever is longer, where the causes of the reduction are clearly reversible and understood and ceased[1]	Data do not support.	Estimated	NO	Nesbitt 2006; Brush 2007; Unpublished Data, Nesbitt
(a)2. An observed, estimated, inferred or suspected population size reduction of at least 30% over the last 10 years or 3 generations, whichever is longer, where the reduction or its causes may not have ceased or may not be understood or may not be reversible[1]	Using 12 years as the generation length, we used the survey data from 1971 – 2007 (36 years) to conduct our trend analysis of annual minimum nest counts.The model was a good fit for the data with an r^2=0.63 and the cubic term was significant (F1, 27 = 5.44, p = 0.0274). However, the estimated change was -8.80 with a 95% confidence interval of -29.57 to 18.09, so it was non-significant for the comparison of the 1971 estimated number of pairs to the 2007 estimated number of pairs and not at the criterion level of 30%. *See Notes*	Estimated	NO	Nesbitt 2006; Brush 2007; Unpublished Data: Nesbitt, Leone
(a)3. A population size reduction of at least 30% projected or suspected to be met within the next 10 years or 3 generations, whichever is longer (up to a maximum of 100 years) [1]	Uncertainties exist. Larger colonies fractionated into smaller colonies with unknown stability and/or success.	Estimated	NO	Nesbitt 2006; Brush 2007; Unpublished Data: Nesbitt
(a)4. An observed, estimated, inferred, projected or suspected population size reduction of at least 30% over any 10 year or 3 generation period, whichever is longer (up to a maximum of 100 years in the future), where the time period must include both the past and the future, and where the reduction or its causes may not have ceased or may not be understood or may not be reversible.[1]	No evidence from recent nesting data to indicate that the population is not stable. Local declines and increases have been documented in the past. From 1989-2007 (not three generations), there is an apparent decline in the minimum number of nesting individuals. However, we are not confident that this decline is not fluctuations within a stable population. The snapshot survey is potentially not capturing the entire nesting population because of the protracted nesting season and these values should be treated as a minimum number of nesting individuals. *See Notes*	Estimated/ Projected	NO	Nesbitt 2006; Brush 2007; Rodgers et al. 1996; Unpublished Data Nesbitt

[1] based on (and specifying) any of the following: (a) direct observation; (b) an index of abundance appropriate to the taxon; (c) a decline in area of occupancy, extent of occurrence and/or quality of habitat; (d) actual or potential levels of exploitation; (e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites.				
(B) Geographic Range, EITHER				
(b)1. Extent of occurrence < 20,000 km^2 (7,722 mi^2) OR	2,276 miles x 1 mile width (shoreline range) = 2,276 sq. miles	Estimated	YES	Fernald and Purdum 1992
(b)2. Area of occupancy < 2,000 km^2 (772 mi^2)	Data not available to determine.	Estimated	NO	Brush 2007
AND at least 2 of the following:				
a. Severely fragmented or exist in ≤ 10 locations	Is not severely fragmented, but colonies are located in approximately 8 geographical locations ("estuary systems").	Observed	YES	Brush 2007
b. Continuing decline, observed, inferred or projected in any of the following: (i) extent of occurrence; (ii) area of occupancy; (iii) area, extent, and/or quality of habitat; (iv) number of locations or subpopulations; (v) number of mature individuals	No definitive data to indicate continuing decline. However, species is extremely sensitive to habitat quality issues and other regions have experienced extreme fluctuations in response to habitat degradation.		NO	Nesbitt 2006; Brush 2007; Rodgers et al. 1996; Schreiber and Burger 2002.
c. Extreme fluctuations in any of the following: (i) extent of occurrence; (ii) area of occupancy; (iii) number of locations or subpopulations; (iv) number of mature individuals	Not documented in Florida, but extreme fluctuations in breeding populations observed in other regions.		NO	Shields 2002
(C) Population Size and Trend				
Population size estimate to number fewer than 10,000 mature individuals AND EITHER	Estimated breeding population has mean of 12,816 individuals for past 3 years (2005 - 2007).	Estimated	NO	Nesbitt 2006; Brush 2007
(c)1. An estimated continuing decline of at least 10% in 10 years or 3 generations, whichever is longer (up to a maximum of 100 years in the future) OR	See above Bb		NO	See above Bb
(c)2. A continuing decline, observed, projected, or inferred in numbers of mature individuals AND at least one of the following:	See above Bb		NO	See above Bb
a. Population structure in the form of EITHER				
(i) No subpopulation estimated to contain more than 1000 mature individuals; OR				
(ii) All mature individuals are in one subpopulation				
b. Extreme fluctuations in number of mature individuals				
(D) Population Very Small or Restricted, EITHER				
(d)1. Population estimated to number fewer than 1,000 mature individuals; OR	Estimated breeding population of more than 10,000 individuals	Estimated	NO	Nesbitt 2006; Brush 2007
(d)2. Population with a very restricted area of occupancy (typically less than 20 km^2 [8 mi^2]) or number of locations (typically 5 or fewer) such that it is prone to the effects of human activities or stochastic events within a short time period in an uncertain future	Estimated to be more than 20 sq km	Estimated	NO	Nesbitt 2006; Brush 2007
(E) Quantitative Analyses				

e1. Showing the probability of extinction in the wild is at least 10% within 100 years	No population viability analyses has been conducted.		NO	

Initial Finding (Meets at least one of the criteria OR Does not meet any of the criteria)	Reason (which criteria are met)
Does not meet any of the criteria	
Is species/taxon endemic to Florida? (Y/N)	NO
If Yes, your initial finding is your final finding. Copy the initial finding and reason to the final finding space below. If No, complete the regional assessment sheet and copy the final finding from that sheet to the space below.	
Final Finding (Meets at least one of the criteria OR Does not meet any of the criteria)	Reason (which criteria are met)
Does not meet any of the criteria for listing *See Notes*	

1	Biological Status Review Information Regional Assessment Species/taxon:	Eastern Brown Pelican (*Pelecanus occidentalis carolensis*)
2	Date:	11/4/10
3	Assessors:	Janell Brush, Gary Sprandel, Steve Nesbitt
4		
5		
6		
7		
8	Initial finding	Supporting Information
9		
10	2a. Is the species/taxon a non-breeding visitor? (Y/N/DK). If 2a is YES, go to line 18. If 2a is NO or DO NOT KNOW, go to line 11.	NO
11	2b. Does the Florida population experience any significant immigration of propagules capable of reproducing in Florida? (Y/N/DK). If 2b is YES, go to line 12. If 2b is NO or DO NOT KNOW, go to line 17.	YES
12	2c. Is the immigration expected to decrease? (Y/N/DK). If 2c is YES or DO NOT KNOW, go to line 13. If 2c is NO go to line 16.	YES
13	2d. Is the Florida population a sink? (Y/N/DK). If 2d is YES, go to line 14. If 2d is NO or DO NOT KNOW, go to line 15.	NO
14	If 2d is YES - Upgrade from initial finding (more imperiled)	
15	If 2d is NO or DO NOT KNOW - No change from initial finding	NO CHANGE
16	If 2c is NO or DO NOT KNOW- Downgrade from initial finding (less imperiled)	
17	If 2b is NO or DO NOT KNOW - No change from initial finding	
18	2e. Are the conditions outside Florida deteriorating? (Y/N/DK). If 2e is YES or DO NOT KNOW, go to line 24. If 2e is NO go to line 19.	
19	2f. Are the conditions within Florida deteriorating? (Y/N/DK). If 2f is YES or DO NOT KNOW, go to line 23. If 2f is NO, go to line 20.	
20	2g. Can the breeding population rescue the Florida population should it decline? (Y/N/DK). If 2g is YES, go to line 21. If 2g is NO or DO NOT KNOW, go to line 22.	
21	If 2g is YES - Downgrade from initial finding (less imperiled)	
22	If 2g is NO or DO NOT KNOW - No change from initial finding	
23	If 2f is YES or DO NOT KNOW - No change from initial finding	
24	If 2e is YES or DO NOT KNOW - No change from initial finding	
25		
26	Final finding	NO CHANGE

Additional Notes associated with BSR Tables:

Generation Length: The generation length used for the Biological Status Review was 12 years. This was based on age of first breeding of 3-5 years, and maximum age of 30 years (Shields 2002). The oldest recaptured individual (according to banding records) was 28 years old. Mean life expectancy once individuals reach breeding age can be estimated at about 5 - 6 years (Schreiber and Mock 1988). Using 12 years as the generation length, we used the survey data from 1971 – 2007 (36 years) to conduct our trend analysis of annual nest counts. We also conducted the analysis using 9 years as the generation length because we decided generation length is most likely somewhere between 9 – 12 years for the species. The criterion was not met using either 9 or 12 years as the generation length.

Population Size Reduction A(2): We compared a linear, quadratic, cubic, and quartic linear model incorporating a negative binomial distribution. For the 12 years generation time model (1971 – 2007), a cubic trend was fit to the data, incorporating a negative binomial distribution (based on lowest AICC). The model was a good fit for the data with an r^2=0.63 and the cubic term was significant (F1, 27 = 5.44, p = 0.0274). However, the estimated change was -8.80 with a 95% confidence interval of -29.57 to 18.09, so it was non-significant between estimated number of pairs between 1971 – 2007 and not at the criterion level of 30%. When we tested a 9-yr generation time (1980 – 2007), the quadratic model was best fit model based on the lowest AICC. The model fits well and predicts a decline (from 1980 to 2007) of 21.50% (95% CI: -35.05 to -5.12). The change was significant but not at the criterion level of 30%. (Figures 1,2).

Figure 1: Generation time = 12 years (1971 – 2007); Criterion not met.

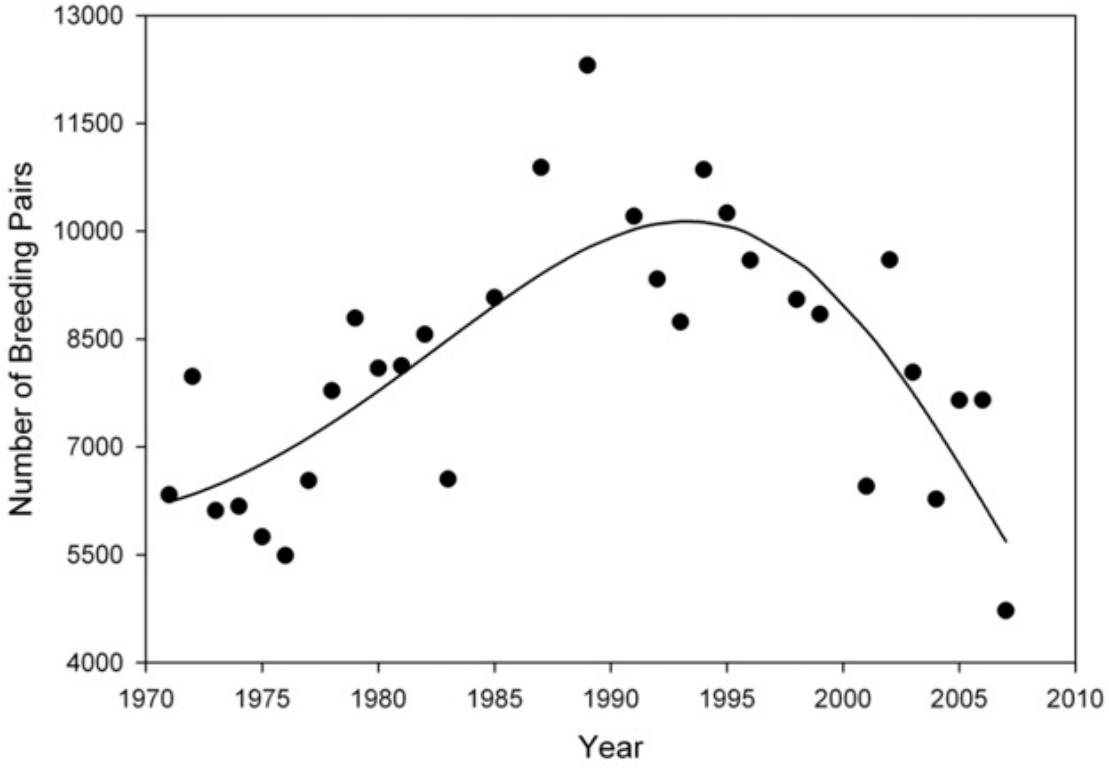
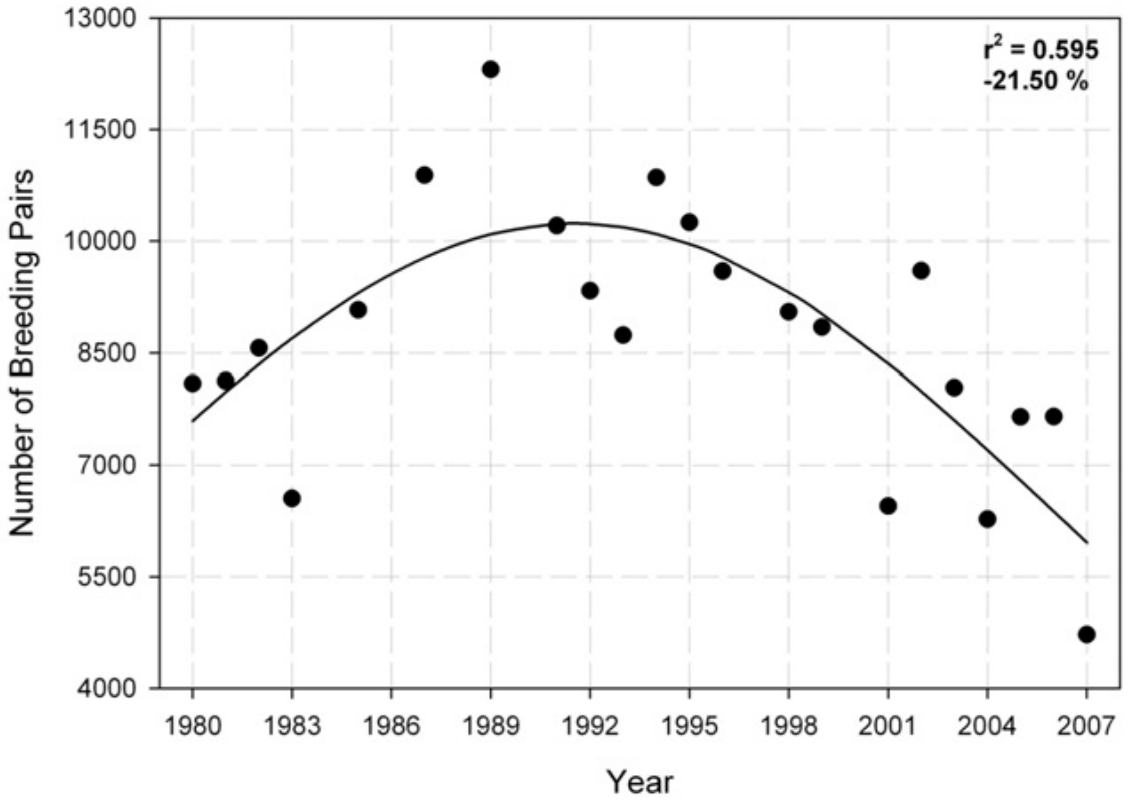


FIgure 2. Generation time = 9 years (1980 – 2007); Criterion not met.



A(4): FWC conducted nesting brown pelican surveys from 1968 – 2007. The surveys were conducted between the middle of April and the first week of May; corresponding to the peak of nesting season for that survey year. Results of these surveys should be seen as a minimum population size. There is no evidence from recent nesting data to indicate that the population is not stable. Local declines and increases have been documented in the past (Rodgers et al. 1996). From 1989-2007 (not three generations), there is an apparent decline in the minimum number of nesting individuals. We are aware that this apparent recent decline could be, to some extent, a product of normal fluctuations in nesting effort within a stable population. These "snapshot" surveys (annual index of nesting population) should be treated as a minimum number of nesting individuals.

Final Finding – Recommendations:

The data used for this BSR is a snapshot of the breeding season. The survey was conducted to correspond to the peak of the breeding season. In the past, this has usually been the last week in April – first week in May (with the exception of Florida Bay). There are annual fluctuations with the timing and duration of the breeding season. In recent years the breeding season may be extended into the summer, depressing the peak and spreading the nesting effort out through the year.

The brown pelican is as an important indicator of the health of near-shore waters and any decrease in population or nesting activity may be indicative of an imbalance in that ecosystem. To ameliorate concerns regarding the long term trends of the Florida brown pelican population we recommend a statewide survey be conducted three times during the nesting season for the next 2-3 years. With additional survey information we will be able to determine if the recent apparent declines in the minimum breeding pelican population are real or just fluctuations in a stable population. We also recommend a productivity study which examines productivity per nest at select colonies. Historically, the Florida population was assumed to be stable, such that individuals were transported from the Florida population to restore the nesting population in Louisiana (Nesbitt 1981; Holm et al. 2003).

Appendix 1. Brief biographies of the members of the Biological Review Group for the brown pelican.

Janell M. Brush received her M.S. in Wildlife Ecology and Conservation from the University of Florida. Janell has managed avian research projects in Florida for over 10 years and joined the FWC in 2006. She is the project leader for two State Wildlife Grant funded coastal waterbird projects in Florida. Janell has experience working on research projects involving many different species of shorebirds and seabirds.

Stephen A. Nesbitt has a M.S. degree in Wildlife Ecology from Oklahoma State University. He has worked as a professional wildlife biologist since 1963 and from 1974 – 2006 with the Florida Fish and Wildlife Conservation Commission. Nesbitt has published over 120 scientific papers on various species in the field of wildlife ecology and population biology, including 70 papers on sandhill cranes.

Gary L. Sprandel has a B.S. degree in Computer Science from Colorado State University with coursework in wildlife biology. He has worked as a geoprocessor for the Kentucky Department of Fish and Wildlife Resources since 2005 on a variety of projects including the State Wildlife Action Plan, public hunting area mapping, survey databases, habitat mapping, and species distribution mapping. From 1992-2005 Gary worked for the FWC as a database manager on many projects including data collection and analysis for wintering shorebird surveys, support of breeding shorebird and seabird surveys, and species and site ranking databases. Gary has over a dozen published papers on Florida's bird life.

Appendix 2. Summary of letters and emails received during the solicitation of information from the public period of September 17, 2010 through November 1, 2010.

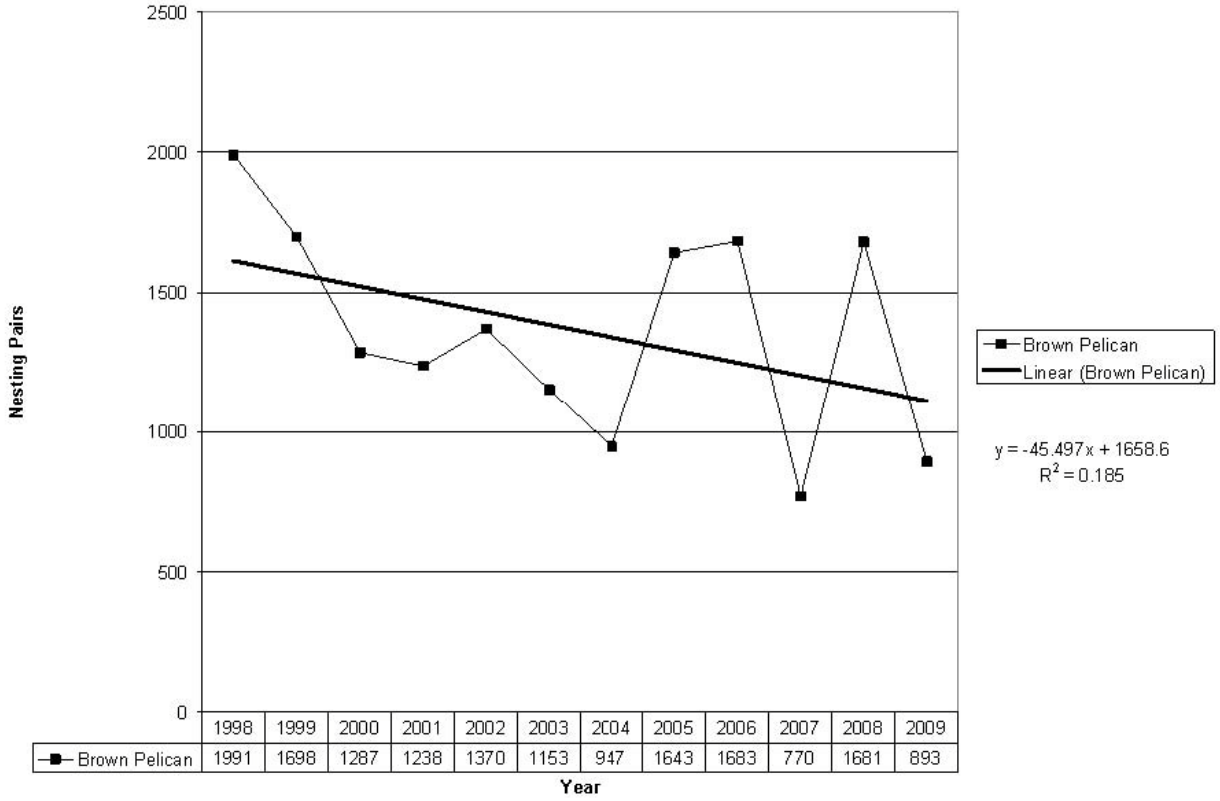
Email from Ann Hodgson, Gulf Coast Ecosystem Science Coordinator, Audubon of Florida, Florida Coastal Islands Sanctuaries, (ahodgson@audubon.org), 410 S. Ware Boulevard, Suite 702, Tampa, Florida 33619, dated October 29, 2010. Dr. Hodgson provided a copy of the following report:

Hodgson, A. and A. Paul. 2010. Twenty-Five Years after Basis I: An Update on the Current Status and Recent Trends in Bird Colonial Waterbird Populations of Tampa Bay, in: Cooper, S.T. (ed.). 2010. Proceedings, Tampa Bay Area Scientific Information Symposium, BASIS 5: 20-23 October 2009. St. Petersburg, FL. 538 pp.

The average number of Brown Pelican nesting pairs in the Tampa Bay Region from 2000-2009 was 1,024 (698 – 1,350). A decline in the population was reported. The region includes one large colony and many smaller colonies. Progressive urbanization threatens to further reduce the ecological integrity of the Tampa Bay ecosystem. More protective regulations, more enforcement, and heightened public cooperation will all be needed to protect this region.

Email from Ann Hodgson, Gulf Coast Ecosystem Science Coordinator, Audubon of Florida, Florida Coastal Islands Sanctuaries, (ahodgson@audubon.org), 410 S. Ware Boulevard, Suite 702, Tampa, Florida 33619) dated November 1, 2010.

The number of nesting pairs of Brown Pelican has locally decreased 55.2% between 1998-2009, years for which Florida Coastal Islands Sanctuaries and its managment partners have consistent survey effort among colonies with pelicans. They estimated the number of birds at Dogleg Key and Dunedin Sand Key West in 2009 by averaging 2008 and 2010 nesting data for each site. Little Bayou was not surveyed in 2009; at Little Bayou, there were 21 pairs in 2008 and 0 pairs in 2010. This colony has included pelicans and mixed Great Egrets and small herons, but is about 50 m from the residential seawall, and may collapse entirely from local predator pressure in the future. The following figure was provided to show regional decline:



Email received from Joseph W. Paeglow (joeednp@aol.com) dated 10/19/10. Provides information about a brown pelican roost on the Orange River in Lee County. The nesting flock has numbered between 30 -35 individuals but they have noticed a decline in the number of individuals every year for the past five years. Nesting season 2009 they had about 15 adults and only 2 young birds. This year the flock had not arrived.

E-mail received from Neil Langenberg, Environmental Specialist, Charlotte Harbor Aquatic Preserves, Florida Department of Environmental Protection, 12301 Burnt Store Rd., Punta Gorda, FL 33955, dated 10/14/10. Provided rookery monitoring data compiled from rookery islands in 2008, 2009, 2010 from staff from Charloee Harbor Aquatic Preserves (CHAP) and J.N. "Ding" Darling National Wildlife Refuge (USFWS). The study area includes the lower Charlotte Harbor area including Pine Island Sound Aquatic Preserve, Matlacha Pass Aquatic Preserve, and portions of J.N. Ding Darling NWR complex. Brown pelican nesting counts were direct counts of active nests via boat during the nesting season. Counts reflect the maximum number or peak estimates of nesting adults by species. Brown Pelican total nest numbers were reported by surveyed colony and for the region (2008) = 411, (2009) = 220, (2010) = 414.

Appendix 3: Information and Comments Received from Independent Reviewers