Black Skimmer Biological Status Review Report

March 31, 2011

FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION
620 South Meridian Street
Tallahassee, Florida 32399-1600

Biological Status Review Report
for the
Black Skimmer
(*Rynchops niger*)
March 31, 2011

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 November 8, 2010 that had not undergone a status review in the past decade. Public information on the status of the black skimmer was sought from September 17 to November 1, 2010. The three-member Biological Review Group (BRG) met on November 3 - 4, 2010. Group members were Nancy J. Douglass (FWC lead), Elizabeth A. Forys (Eckerd College), and Gary L. Sprandel (Kentucky Department of Fish and Wildlife Resources) (Appendix 1). In accordance with rule 68A-27.0012, Florida Administrative Code (F.A.C.), the BRG was charged with evaluating the biological status of the black skimmer using criteria included in definitions in 68A-27.001, (F.A.C.) 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/imperiled/listing-action-petitions/ to view the listing process rule and the criteria found in the definitions.

In late 2010, staff developed the initial draft of this report which included BRG findings and a preliminary listing recommendation from staff. The draft was sent out for peer review and the reviewers' input has been incorporated to create this final report. The draft report, peer reviews, and information received from the public are available as supplemental materials at http://myfwc.com/wildlifehabitats/imperiled/biological-status/.

The Black Skimmer BRG concluded from the biological assessment that the black skimmer met listing criteria, and FWC staff recommends listing the black skimmer as a Threatened species.

This work was supported by a Conserve Wildlife Tag grant from the Wildlife Foundation of Florida. FWC staff gratefully acknowledges the assistance of the biological review group members and peer reviewers. Staff would also like to thank Michelle VanDeventer who served as a data compiler on the species and drafted much of this report.

BIOLOGICAL INFORMATION

Life History References – Brinkley and Humann, 2001; Gochfeld and Burger, 1994; Breeding bird atlas.

Population Status and Trend - Recent research indicates a decline in black skimmer populations in the Chesapeake Bay region (Brinker et al. 2007), Galveston Bay (Gawlik et al.

1998), coastal Louisiana (Visser and Peterson, 1994), and Mustang Island, TX (Foster et al. 2009).

In Florida, Clapp et al. (1983) estimated that at least 2,900 black skimmers nested along the northeastern coast of the state and a minimum of 1,600 skimmers nested on the Gulf coast in the late 1970s, for a statewide population estimate of at least 4,500 individuals. However, the report further states that the total population was not adequately surveyed or comprehensive, and the authors did not account for inland or rooftop colonies that were known to occur at the time. Loftin and Smith (1996) estimated the Florida population of black skimmers at 1,500 – 2,000 pairs (3,000 – 4,000 individuals) based on reports from the early 1990s. During a 3-year survey from 1998-2000, Gore et al. (2007) found a mean 1,689 pairs of black skimmers nested at ground sites in Florida annually during the survey period. While variability in methodologies and coverage between these three studies prohibit detailed comparisons, they do illustrate a likely decreasing population trend in Florida.

Records of black skimmers indicate a statewide trend of reduced breeding colony size. Stevenson and Anderson (1994) refer to a single colony of black skimmers in 1935 that was comprised of approximately 2,000 pairs. In the late 1970's, the largest colony recorded in the state consisted of 1,000 pairs in Nassau County (Clapp et al. 1983). Gore et al. (2007) counted 350 pairs of skimmers in Nassau County as the largest colony during the 1998 – 2000 breeding seasons. During the 2010 breeding season, the largest colony had 450 pairs of black skimmers, and, of the 19 ground colonies reported in 2010, 63% (n=12) consisted of less than 50 pairs (unpublished data). Surveys from the 1970's indicate there were a total of 13 colonies in the state, excluding inland and rooftop colonies (Clapp et al. 1983). From 1998-2000 skimmers nested in a maximum of 38 ground colonies (Gore et al. 2007).

Geographic Range and Distribution – Black skimmers are primarily a coastal species that breed in loose colonies on sandy beaches. The breeding range of *R. n. niger* extends from the northeast of the U.S., along the Atlantic and Gulf coasts, and into Mexico. On the Pacific coast, the species breeds along the southern California coastline, inland at the Salton Sea, along western Mexico and south to Ecuador (Gochfeld and Burger, 1994). Florida's skimmers include resident populations as well as individuals that migrate from the north during the winter. Nesting skimmers can be found widely scattered along much of Florida's coastline. However, nesting along the east coast of Florida is now extremely sparse with only 2-3 ground colonies per year (one of which consists of a single pair) and a handful of occupied rooftops from Brevard County to Palm Beach County (unpublished data). Black skimmers were not known to nest south of Charlotte Harbor and Brevard County prior to 1975 (Stevenson and Anderson, 1994). Zambrano and Smith (2003) reported that all the southernmost known nesting of the species on Florida's Atlantic coast occurred on rooftops. They now occupy both rooftops and beaches on the southwest coast, including the largest colony reported in the state in 2010 consisting of 450 pairs. Skimmers still only nest on rooftops on the southeast coast (unpublished data).

Quantitative Analyses - There has not been a comprehensive population viability analysis on the black skimmer or the Florida population of black skimmers.

BIOLOGICAL STATUS ASSESSMENT

Threats – Habitat loss during the past decades has been extremely high for beach-obligate species such as the black skimmer. The American Bird Conservancy lists coastal habitats in their "Top 20 Most Threatened Bird Habitats in the U.S." report (2007), with development, recreation, pollution, global warming, coastal engineering projects, and invasive species all listed as threats. Hunter et al. (2006) determined that black skimmers, along with other beach-nesting species, are a highly vulnerable species and concluded that population declines will continue without conservation measures to protect nesting habitats. Recreational activity, shoreline hardening, mechanical raking, oiling of adults or breeding areas following spills, beach driving, and increased presence of domestic animals are all examples of human-induced negative impacts to coastal habitats critical to roosting and breeding skimmers.

Rats, raccoons, opossums, crows, feral hogs, and coyotes are known predators of skimmer eggs and chicks, and have responded positively to increased human presence and development. Predation pressure from growing colonies of gulls may be an issue for this species (Hunter et al. 2006; O'Connell and Beck, 2003). In Tampa Bay, for example, laughing gull colonies have increased from approximately 10,000 pairs to over 30,000 pairs since 2006 (Burney, 2009). Additional emerging threats which are poorly understood but have generated concern are invasive species such as fire ants and carnivorous lizards.

The breeding behavior of black skimmers means that they are vulnerable to the aforementioned direct threats, as well as more subtle impacts and combination effects. For example, repeated flushing off nests and eggs by human recreational disturbance can result in thermal stress for developing eggs and chicks, especially as skimmers are slow to return to nesting sites following disturbance (Gochfeld and Burger, 1994; Burger et al. 2010). Breeding colonies are especially sensitive to disturbance during the period prior to egg laying (Gochfeld and Burger, 1994; Burger et al. 2010), and high disturbance rates have been correlated to site abandonment and low nest survival at colonies (Gochfeld and Burger, 1994; Dinsmore 2008). The diminishing availability of beach nesting habitat as a result of human disturbance related to recreation is a growing threat as indicated by the steadily increasing visitation to Florida State Parks, many of which are historical nesting sites for these birds (Sims and Graham, 2009), as well as increasing vessel registrations in Florida (FWC, 2009).

Because of their high degree of sensitivity to disturbance and the intensity of recreational use of Florida's beaches, most colonies in Florida would fail without management. All documented colonies of black skimmers in Florida are managed to some degree, usually involving the posting of informational signs and symbolic fencing. Much of this effort is undertaken by volunteer programs and local land managers. Continued management is highly vulnerable to reductions in funding.

Mechanical raking, an activity that is relatively common on Florida's public recreational and privately owned beaches, can result in direct take of nests or prevent skimmers from nesting (E. Forys, pers. comm). Managers and monitors of beach-nesting bird sites in Florida also convey alarm about the threat presented by the presence of dogs on beaches, either due to ordinances that allow dogs or weak enforcement of pet prohibitions (Pruner and Johnson, 2010).

This is consistent with observations in other states, where the presence of leashed and unleashed dogs is common even on beaches where such activity is prohibited (USFWS, 2007).

Roadkill is also a documented threat to black skimmers. Skimmers will nest on roadsides and causeways. As beach habitats become more limiting, these alternative nesting habitats may be used with greater frequency, rendering this as a potentially significant cause of mortality among adults and flightless young. Similarly, beach driving poses a threat, especially to flightless young.

The pressure on Florida's coastal ecosystems will continue to grow as the number of people living in coastal counties increases (predicted to double from 12.3 million to more than 26 million by 2060) and the impacts of climate change intensify (e.g., sea level rise, stronger weather events, disruption of weather and ocean patterns). Non-native vegetation, dune and shoreline stabilization, and human related activities such as beach driving all degrade existing habitat. Sea level rise and the consequential "coastal squeeze" (habitat and species unable to migrate inland due to structures) further limit the amount of available habitat and will likely exacerbate these threats in the future. While many of the largest colonies are located on public lands, those areas are generally managed for recreational use. Skimmer nesting generally coincides with two summer holidays, Memorial Day and Fourth of July, when recreational pressures peak. This timing renders them particularly vulnerable to nest failure due to intensive disturbance. Historically there has been limited public support for curtailing recreational use in order to adequately protect beach-nesting birds and a lack of regulatory infrastructure to protect nesting skimmers from incompatible beach management practices and recreation, contributing to continued loss of suitable habitat and poor reproductive success.

Unlike least terns, black skimmers nesting on rooftops generally have poor success or fail completely (Greene and Kale, 1976; Fiske, 1978; Gore, 1987). The increasing use of rooftops by breeding black skimmers may represent a biological sink. Black skimmers in Florida historically nested in large colonies that have since been fractionated into smaller colonies, likely as a response to habitat degradation and increased predation pressure. The implications of this are not well understood, but Gochfeld and Burger (1994) state that nesting success is usually higher in larger, well-established colonies. The point at which fragmentation results in colonies too small to fight off predators is unknown, but may already be a factor contributing to reduced reproductive success.

Population Assessment -- Findings from the Biological Review Group are included in Biological Status Review Information Findings tables.

LISTING RECOMMENDATION

Staff recommends that the black skimmer be listed as a Threatened species because the species met criteria for listing as described in 68A-27.001, F.A.C., based on projected population declines due to low reproductive success and increased predation and competition; limited geographic range combined with population declines and vulnerability to stochastic events; and limited population size combined with population decline.

SUMMARY OF THE INDEPENDENT REVIEW

Comments were received from 5 reviewers, Monique Borboen (Audubon of Florida), Chuck Hunter (U. S. Fish and Wildlife Service), Dr. Patrick Jodice (Clemson University), Marianne Korosy (PhD Candidate, University of Central Florida), and Julie Wraithmell (Audubon of Florida). Appropriate editorial changes recommended by the reviewers were made to the report. One reviewer recommended adding roadkill as an historical and ongoing threat to the black skimmer and adding feral hogs as a predator. Additionally, the reviewer asked that the dependence of this species on intensive management, and the vulnerability of that management to funding reductions, be acknowledged in the BSR. Staff concurred, and added mention of these threats in the report. These additional threats, however, did not result in changes to the findings or staff recommendations. All reviewers concurred with the staff recommendation. Peer reviews are available at MyFWC.com.

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Biological Status Review Information
Findings

Species/taxon: Black Skimmer/*Rynchops niger*
Date: 11/03/10
Assessors: Nancy Douglass, Gary Sprandel, Beth Forys

Generation length: 7 years (Gochfeld and Burger 1994; Schreiber and Burger 2002)

Criterion/Listing Measure	Data/Information	Data Type*	Sub-Criterion Met?	References
*Data Types - observed (O), estimated (E), inferred (I), suspected (S), or projected (P). Sub-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]	No data to support this conclusion	None	NO	Clapp et al. 1983; Loftin and Smith 1996; Gore et al. 2007
(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]	No data to support this conclusion	None	NO	Clapp et al. 1983; Loftin and Smith 1996; Gore et al. 2007
(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]	A3(b): Average productivity of 0.15 fledges/pair (SD ±0.08) indicates future population decline. Documented declines in Tampa Bay area (32%) and Northeast region (91.6%). Additional supporting indications from Collier County. A3(e): Competition with and predation by increased populations of gulls and crows is a concern.	Estimated/ Suspected/ Projected	YES - b, e	Burney 2009; Forys 2010; Unpublished Data, M. Borboen
(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]	A4(b): Timeframe considered is 2002 - 2022. Average productivity of 0.15 fledges/pair (SD ±0.08) from 2002 - 2010 indicates future population decline. Documented declines in Tampa Bay area (32%) and Northeast region (91.6%) from 1970s to 2010. Additional supporting indications from Collier County. A4(e): Competition with and predation by increased populations of gulls and crows is a concern.	Estimated/ Suspected/ Projected	YES - b, e	Burney 2009; Forys 2010; FWC unpublished data; Unpublished Data, M. Borboen
[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	Linear miles of coastline = 2,276 miles x 1 mile width (beach range) = 2,276 sq miles. Generous overestimate which includes unsuitable habitat. Excessive estimate of beach width.	Estimated	YES	Fernald and Purdum, 1992.

(b)2. Area of occupancy $< 2{,}000$ km^2 (772 mi^2)	Combining total beach/surf zone and coastal strand habitats = 73.7 sq miles. Actual area of occupancy is less; this represents potential occupancy.	Estimated	YES	FFWCC 2005 "Florida's Wildlife Legacy Initiative"
AND at least 2 of the following:				
a. Severely fragmented or exist in $\leq$ 10 locations	Is not severely fragmented. Colonies are in fewer than 10 locations.	Estimated/ Suspected	YES	Burney 2009
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	Bb(iii) and Bb(v): (iii) Quality of habitat is declining due to increased beach recreational pressures and associated management, 59% of beaches are eroded; intense population growth in the southwest region (particularly in the 1970s) has already resulted in decline in quality of habitat in that region. Productivity data appears to be below rates required for stability. We are projecting the number of mature individuals will decline based on the presented productivity rates (see above). This assumes that the low productivity seen in 62% of the population is representative of the state.	Observed/Inferred/Projected	YES - iii, v	FFWCC 2008 "2060 Report"; Fernald and Purdum, 1992; ABC 2007 Threatened Habitats; DEP 2010; Clark 1993 (DEP Report); Forys 2010; unpublished data, M. Borboen
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	No data to support this conclusion	None	NO	None
(C) Population Size and Trend				
Population size estimate to number fewer than 10,000 mature individuals AND EITHER	Population estimated in 1998 - 2000 3672 breeding adults (range: 3118 - 4149)	Estimate	YES	Gore et al. 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	May have met this criterion, but uncertainty exists with methods for historic population estimates.	None	NO	Clapp et al. 1983
(c)2. A continuing decline, observed, projected, or inferred in numbers of mature individuals AND at least one of the following:	Average productivity of 0.15 fledges/pair (SD ±0.08) indicates future population decline. Documented declines in Tampa Bay area (32%) and Northeast region (91.6%). Additional supporting indications from Collier County. Competition and predation with increased populations of gulls and crows is a concern.	Estimated/ Suspected/ Projected	YES	Forys 2010; Burney 2009; Unpublished Data, M. Borboen
a. Population structure in the form of EITHER	Subpopulation is more than 1,000 mature individuals.	None	NO	Gore et al. 2007
(i) No subpopulation estimated to contain more than 1000 mature individuals; OR				
(ii) All mature individuals are in one subpopulation	All the skimmers in Florida are part of one subpopulation	Suspected	YES	Gore et al. 2007
b. Extreme fluctuations in number of mature individuals	No data to support this conclusion	None	NO	
(D) Population Very Small or Restricted, EITHER				
(d)1. Population estimated to number fewer than 1,000 mature individuals; OR	Data do not support this.		NO	Gore et al. 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	Data do not support this.		NO	Gore et al. 2007
(E) Quantitative Analyses				
e1. Showing the probability of extinction in the wild is at least 10% within 100 years	May meet this criterion, assuming adult survival is 94% or less and the southwest regional population is representative of the state population. Issue with lack of adult survival data for Black Skimmers in Florida.	None	NO	Forys 2010

Initial Finding (Meets at least one of the criteria OR Does not meet any of the criteria)	Reason (which criteria/sub-criteria are met)
Yes, does meet the criteria	A3(b,e), A4(b,e), B1, B2, B(a), B(b)iii, B(b)v, C, C2, C2(a)ii
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/sub-criteria are met)
Yes, does meet multiple criteria.	A3(b,e), A4(b,e), B1, B2, B(a), B(b)iii, B(b)v, C, C2, C2(a)ii

1	Biological Status Review Information Regional Assessment	Species/taxon: Black Skimmer/Rynchops niger
2		Date: 11/3/10
3		Assessors: Nancy Douglass, Gary Sprandel, Beth Forys
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.	DO NOT KNOW, no banding data to determine significant immigration, declines at locations outside of Florida have been documented, no new colonies or growth of colonies to indicate immigration (regional data from Brinker et al. 2007; Gawlik et al. 1998; Visser and Peterson, 1994; Foster et al. 2009; Hunter et al. 2006)
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.	
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.	
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	
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	NO CHANGE
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

APPENDIX 1. Brief biographies of the Black skimmer Biological Review Group members.

Nancy J. Douglass received her B.S. in Wildlife and Fisheries Biology from the University of Vermont and her Masters of Environmental Management from Duke University. She has over 23 years of experience working in the wildlife profession, 20 of which have been with the Florida Fish and Wildlife Conservation Commission as a regional biologist. Her area of expertise is nongame wildlife but she is most recognized for her expertise in seabird and shorebird conservation.

Elizabeth A. Forys received a M.S. in Environmental Science/Ecology from the University of Virginia and a Ph.D. in Wildlife Ecology and Conservation from the University of Florida. She is currently a professor at Eckerd College in St. Petersburg, Florida. She has over 30 publications on endangered species theory and management and 8 specifically on shorebirds and seabirds including American oystercatchers, black skimmer, least terns, and snowy plovers in Florida. For the past 10 years Beth has helped coordinate a project that monitors, maps, and protects beach and roof-top nesting birds throughout west-central Florida.

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 through November 1, 2010.

Email from Monique Borboen-Abrams, NE Florida Policy Associate, Audubon of Florida (St. Augustine, FL) dated October 29, 2010. Ms. Borboen-Abrams provided a compilation of historical black skimmer data for NE Florida illustrating population declines, poor reproductive success, and lack of roof nesting in this portion of the state.

Email from Ann B. Hodgson, Gulf Coast Ecosystem Science Coordinator, Audubon of Florida, Florida Coastal Islands Sanctuaries, (Tampa, Florida) 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.