

From: [Britta Muiznieks](#)  
 To: [Mike Murray](#)  
 Cc: [Darrell Echols](#); [Thayer Broili](#); [Doug McGee](#)  
 Subject: Re: Fw: Possible DFCs for AMOY, CWB and SBA  
 Date: 10/07/2009 12:39 AM

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Following are my comments on the CWB DFCs.

- In column one of the DFCs for CWBs (Variable-Annual peak number of XX nests) the "Variable" needs to be clarified. For me to feel comfortable utilizing the numbers for any sort of averaging I would have to look at the raw data to see if the numbers in the table really are comparable. Does anyone know the source(s) of the data in the Excel table? I know we had a similar table in the IPSMS but that doesn't necessarily mean that it was good data. Counts that were conducted by NCWRC are probably counts that were taken during the survey window (last week of May –first week of June). I'm not sure when NCWRC started their "standardized" counts and earlier year's counts may have been conducted differently than more recent counts. The counts conducted by NCWRC don't necessarily represent peak numbers for these species. Without looking at the CAHA data more closely I don't know if the numbers in the table are peak colony counts or if they are survey window counts. Were these numbers taken from the Annual CWB reports or were they taken independently by NCWRC staff with the help of NPS staff at CAHA? What I do believe is that in the past CWBs were neglected (e.g. lack of staff and other priorities-PIPLs etc.) and standardized counts were not conducted. From my recollection of reading old annual reports (I haven't looked at them too closely recently), it almost seemed that if there was some spare time a walkthrough may have been conducted through active colonies. If we can confirm the numbers in this table then I would feel a whole lot more comfortable in using it.
- I know that the reasoning for using the survey window is to avoid including birds that are reneesting. By limiting the survey to a two week period you are minimizing the chances of including birds that are reneesting. From what I have seen at CAHA in the last few years the COTE, GBTE, and BLSK tend to peak later than the LETES. I am not sure if that is a generalization just for CAHA or if it is a statewide phenomenon. What we need to decide for the DFC is whether we are interested in the peak nest count for a colony (regardless of whether it occurred at the beginning or end of the summer) or if we are only interested in the numbers that we have on the seashore during the survey window.
- I am also concerned that these numbers can be strongly influenced by predators/predation. If for some reason we have to back off of the predator removal program then there would be no way of attaining these numbers.
- The short-term and long-term targets for all species besides LETE do seem overly optimistic. That may be because we have not been anywhere close to these numbers since my tenure at the park. Maybe a more realistic goal would be for their populations to stabilize (based on a 5 year average) rather than to continue to decline. LETEs do seem to be on the rebound but even those numbers seem to be all over the place (0.06-0.34-percentage of total nests). What I don't know is if LETEs are doing better at CAHA, does this mean that they are doing worse somewhere else (i.e. offshore island flooded or overgrown)? Is the increase in numbers at CAHA the result of recruitment (other colonies elsewhere doing better or worse)? Again, I think we should look closely at all the numbers in the excel table to make sure they are comparable.

As far as the DFCs for SBA, I am all right with it as long as Park staff are not expected to do the restoration. Would there be someone who is familiar with the plant to conduct the study?

As long as the AMOY DFCs are "desired" conditions, I am OK with them. Should the second variable read "Percent of pairs (not nests) producing at least one hatchling"?

Britta Muiznieks  
 Wildlife Biologist  
 Cape Hatteras National Seashore

-----Mike Murray/CAHA/NPS wrote: -----

To: Darrell Echols/CAHA/NPS@NPS  
 From: Mike Murray/CAHA/NPS  
 Date: 10/01/2009 11:31AM  
 cc: Thayer Broili/CAHA/NPS@NPS, Doug McGee/CAHA/NPS@NPS, Britta Muiznieks/CAHA/NPS@NPS  
 Subject: Fw: Possible DFCs for AMOY, CWB and SBA

Darrell,

We need to make some decisions and move forward on the draft DFCs attached below. I am comfortable with the one for seabeach amaranth (which was based on discussion between Britta and me). I concur with Tim's suggestion (embedded in the AMOY DFC table) that we drop "nest survival" as a DFC since fledge rate is the ultimate measure of nest and chick survival. As background, we (I) had simply suggested AMOY nest survival as an option to consider, since we have good data from the NC State AMOY reports and our AMOY nest survival has been improving in recent years.

Please have a discussion with available staff by the end of next week about the proposed CWB DFC. The origin of the target numbers is that the State has state-wide CWB nest count data (though potentially imprecise for all the reasons Britta has previously stated) and state-wide species goals. By calculating CAHA's historic average contribution (%) to the State-wide totals (which Tim has done in the attached Excel spreadsheet), it gives us a % by which to calculate our desired contribution to the State-wide goal for each CWB species. This sounds good in theory, but do the numbers generated seem reasonable? My gut feeling is that the DFC numbers for least terns and possibly black skimmers are reasonable, but the numbers for common terns and gull-billed terns are not realistic, given the current low level of breeding activity. If that our collective assessment (i.e., Mike, Darrell, Thayer, Britta, and Doug's), the question becomes: If we don't use the DFCs suggested, what do we use?

I know Britta is on leave, but I let her know by email before she left that we would need to make a decision and move on in her absence and asked for her input, but there would be one last opportunity to review/adjustment for the DEIS is "final." I doubt she had a chance to reply, so I don't know what she thinks about it.

Please have a discussion, with available staff before the end of next week to review the CWB DFCs, and determine if we think some, all or none are realistic. If some are NOT, then come up with a different methodology for establishing the DFCs (i.e., something other than "% of the State goal"). In principle, I think it would be better to have a consistent methodology for all four CWB DFCs (i.e., if we don't use "% of the State goal" for all four species, then we probably should not use "% of state goal" for any species), but that means we would need to craft a different DFC methodology that makes sense for all four species. If the consensus is that "% of state goal" is not a good approach, then please propose something else that would set the bar at an ambitious but realistic level and be practical to implement. I don't want to keep sending Tim back to the drawing table on this. We need to decide what we think it should be and move on.

Thanks,

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----- Forwarded by Mike Murray/CAHA/NPS on 10/01/2009 11:02 AM -----

**Timothy  
 Pinion/Atlanta/NPS**

09/23/2009 09:22 AM

To: Mike Murray/CAHA/NPS@NPS  
 cc: Britta Muiznieks/CAHA/NPS@NPS, cherry\_green@nps.gov,  
 Darrell Echols/CAHA/NPS@NPS, Sandra  
 Hamilton/DENVER/NPS@NPS, Sherri\_Fields@nps.gov,  
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Subject: Re: Possible DFCs for AMOY, CWB and SBA 


Thanks, Mike, for the information provided in your email below. I have drafted DFC tables for AMOY, CWB, and SBA based on your input. I am also attaching an excel file with CWB nest counts and targets in case anyone wants to play with the numbers.

I will continue to ponder a habitat variable for PIPL.

--Tim

Tim Pinion  
 Wildlife Biologist and T & E Coordinator  
 National Park Service, Southeast Region  
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 Mike Murray/CAHA/NPS

**Mike  
Murray/CAHA/NPS**

09/15/2009 09:51  
AM

To: Timothy Pinion/Atlanta/NPS@NPS  
cc: cccherry\_green@nps.gov, Sherri\_Fields@nps.gov, Thayer  
Broili/CAHA/NPS@NPS, Darrell Echols/CAHA/NPS@NPS,  
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Subject: Possible DFCs for AMOY, CWB and SBA 

Tim,

Here are some ideas for Desired Future Conditions for AMOY, CWB and Seabeach Amaranth (SBA). In general, we think these DFCs could/should have fewer "variables" than the DFCs for PIPL and sea turtles. We would appreciate your help in drafting these.

**American oystercatchers (AMOY):**

References: CAHA AMOY data that Britta perviously sent you (pasted below). *American Oystercatcher Research and Monitoring in NC, 2008 Annual Report*, Simons and Schulte (follow link):

[http://www.ncsu.edu/project/simonslab/AMOY/References/2008\\_NC\\_AMOY\\_Report.pdf](http://www.ncsu.edu/project/simonslab/AMOY/References/2008_NC_AMOY_Report.pdf)

**CAHA AMOY data**

Year	# Pairs	#	#	Ave Brood Size	Chicks Fledged		Broods w/		Fledge Rate
					#	%	#	%	
1999	41	14	23	1.6	5	22%	5	36%	0.12
2000	37	16	32	2.0	9	28%	7	44%	0.24
2001	39	22	42	1.9	24	57%	15	68%	0.62
2002	31	10	19	1.9	9	47%	7	70%	0.29
2003	32	18	28	1.6	7	25%	6	33%	0.22
2004	29	23	26	1.1	19	73%	12	52%	0.66
2005	26	18	39	2.2	11	28%	7	39%	0.42
2006	23	19	36	1.9	9	25%	7	37%	0.39
2007	23	15	27	1.8	12	44%	8	53%	0.52
2008	23	13	23	1.9	17	74%	10	77%	0.74
2009	23	15	31	2.07	13	42%	8	53%	0.57
<b>1999-2007 AVG:</b>	<b>31.2</b>	<b>17.2</b>	<b>30.2</b>	<b>1.8</b>	<b>11.7</b>	<b>39%</b>	<b>8.2</b>	<b>48%</b>	<b>0.39</b>
<b>2008 Comparison:</b>	<b>-8.2</b>	<b>-4.2</b>	<b>-7.2</b>	<b>0.1</b>	<b>5.3</b>	<b>35%</b>	<b>1.8</b>	<b>29%</b>	<b>0.35</b>
<b>1999-2008 AVG:</b>	<b>30.4</b>	<b>16.8</b>	<b>29.5</b>	<b>1.8</b>	<b>12.2</b>	<b>42%</b>	<b>8.4</b>	<b>51%</b>	<b>0.42</b>
<b>2009 Comparison:</b>	<b>-7.4</b>	<b>-1.8</b>	<b>1.5</b>	<b>0.3</b>	<b>0.8</b>	<b>0%</b>	<b>-0.4</b>	<b>2.3</b>	<b>0.14</b>

**Background:** AMOY are relatively well studied at CAHA and CALO (e.g., the series of research projects by Simons et al) and there is pretty good data in recent years. In general, AMOY have had low productivity throughout NC and the research at CAHA/CALO shows that, among other things, low nest survival and low chick fledge rate are key issues. These are affected by a number of factors, particularly mammalian predation which accounted for 54% of known nest losses and an estimated 74% of all nest losses after unattributed losses were allocated. The number of nesting pairs at CAHA has decreased from a high of 41 prs in 1999 to 23 prs in recent years; however, what we have seen the past few years (2007-2009), which corresponds with increased predator control efforts as well as with interim strategy and consent decree, is a stable number of pairs (though there has been turnover in individuals), a reduction in the number of nests (meaning better nest survival and fewer re-nest attempts), and improved fledge rate (i.e., same number of pairs are more productive, but so far an increase in the number of pairs is "lagging"). Since we have no control over what happens to the pairs when they leave the park for the non-breeding season and have no good idea what may be happening to them, we think that nest survival and fledge rate are the best overarching indicators of progress since these directly relate to things we can manage and will directly affect or relate to other (potential) variables such as number of pairs and depredation rate. In other words, if we want to limit the number of targets for AMOY to just a few, we think nest survival and fledge rate capture the key issues for AMOY better than # of pairs or depredation rate would.

**Suggested AMOY DFCs:**

Nest survival rate (i.e., % of nests that hatch): (p. 19 of 2008 AMOY report - of all AMOY nests monitored from 1995 to 2008, an estimated 24.6% survived to hatching). We could have a short-term target of "**5 yr avg nest survival is 40% or higher**" and a long-term goal of "**5-yr avg nest survival is 50% or higher**" (Note: We believe the progress targets are realistic and sustainable, based on improved nest survival rates in

recent years.)

Chick fledge rate (p. 31 of 2008 AMOY report - data from NC study sites, primarily CALO and CAHA, for 1995-2008 indicated an avg of .309 chicks fledged per nesting pair. We could have short- and long-term targets of "5-yr avg fledge rate of 0.40 or higher" (based on an avg improvement of approx. 3% per year) and a long-term target of "5-yr chick fledge rate of 0.54 or higher" (based on an avg improvement of approx. 3% per year), or something similar. (Note: We believe the progress targets are realistic and sustainable, based on improved fledge rates in recent years.)

**CWBs (CAHA focus is on least terns, common terns, gull-billed terns, and black skimmers):**

(references attached: 2007 NCWRC CWB Summary; CAHA Table 16 - CWB data)

**Background:** Peak nest count surveys have generally been documented by the State only every 3 yrs, so there is state-wide historic data but it is unclear whether consistent methods or level of survey effort were utilized.

For the most part, the historic data has been "peak nest counts" and there is little information for the State or for CAHA about the number of breeding pairs, productivity, fledge rates, etc. While having a more sophisticated CWB target for "productivity" (fledge rate, etc.) would be desirable, it would be inherently difficult to measure even if we wanted to. The State has established State-wide goals for CWB species (target for # of nests), including the 4 species of interest at CAHA. See p. 10 of 2007 State report for state-wide goals for nesting CWB by species and p. 11 for historic state-wide totals of CWB nesting by species; ). See CAHA Table 16 (attached) for the historic totals for CAHA of nesting CWB by species. Note: We have had preliminary discussions with NCWRC about standardizing our CWB survey methods in and around CAHA, so both WRC and CAHA can have a coordinated and consistent approach to CWB nest counts in the Outer Banks area as we move forward.

**Possible CWB DFC:** Compare CAHA's historic data with the State-wide data 4 species of interest for the same years to determine a CAHA "average %" then apply that % to the State-wide goals by species to determine CAHA's % share of the State-wide goal. For example, (numbers used are hypothetical for illustration purposes), if a.) CAHA has historically accounted for 10% of the least tern (LETE) nesting in the state by comparing CAHA totals for LETE to the State-wide total during the year's that the State compiled data; and b.) the state-wide goal for LETE is 2000 nests (Table 1, p. 10); then c.) CAHA's long-term goal would be 200 nests. The short-term goal could be half-way between our most recent 5-yr average (let's say the current 5-yr avg is 100 nests for illustration purposes). For example, if the long-term goal were 200 nests, then the short-term goal could be 150 (i.e., half-way toward the long-term goal). If this approach more or less makes sense, would you be able to do the math for each of the four species to determine possible short-term and long-term targets.

**Seabeach Amaranth**

**Background:** (from p. 5 of Pete Benjamin's comments to RegNeg)

The recovery criteria identified in the Recovery Plan for Seabeach amaranth (*Amaranthus pumilus*), Rafinesque (1996), state that a "minimum of 75 percent of the sites with suitable habitat be occupied by seabeach amaranth populations for 10 consecutive years." Cape Hatteras National Seashore has at least four seabeach amaranth sites – Bodie Island spit, Cape Point, Hatteras Inlet spits (Hatteras Island spit and North Ocracoke spit) and Ocracoke Inlet spits (Southern Ocracoke Island spit). Based on the stated recovery criteria, an appropriate goal would be to implement management control to promote and protect the occurrence of seabeach amaranth, at a minimum, at three of the four identified sites.

Note: Since we have not seen any SBA here for several years, basing a DFC on the recovery plan goal as described above likely means that we may need to develop a reintroduction program at the four sites. I don't know what that would entail (e.g., does FWS or other entity maintain a seed stock for such purposes?), but we will talk to FWS about it.

**Possible DFC for SBA** (adapted from the above) : Short-term: Implement an SBA re-introduction plan.

Long-term: SBA occurs on the Seashore for 5 consecutive years

Thanks,

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[attachment "WRC 2007 CWB report.pdf" deleted by Timothy Pinion/Atlanta/NPS]  
[attachment "Table 16-CWB-corrected.091009.doc" deleted by Timothy Pinion/Atlanta/NPS]

[attachment

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[attachment "DRAFT\_Desired\_conditions\_SBA\_20090922.docx" removed by Britta Muiznieks/CAHA/NPS]  
[attachment "DRAFT\_Desired\_conditions\_AMOY\_20090922.docx" removed by Britta Muiznieks/CAHA/NPS]  
[attachment "DRAFT\_Desired\_conditions\_CWB\_20090922.docx" removed by Britta Muiznieks/CAHA/NPS]  
[attachment "CWB\_NC\_CAHA\_nest counts.xlsx" removed by Britta Muiznieks/CAHA/NPS]