

To: Jekyll Island Authority
From: Brad Bergstrom, Sid Painter
RE: comments on proposed deer management
Date: 16 September 2014

To Whom It May Concern:

We are biologists with many years of experience in mammalian reproductive and population biology and ecology. We recognize that White-tailed Deer (*Odocoileus virginiana*) when uncontrolled by natural predators and/or human harvest can become over-abundant and cause a myriad of problems for society and for natural ecosystems. Overbrowsing by deer sometimes can threaten populations of rare and other native plants and can remove habitat that is vital to other native wildlife such as Neotropical migrant songbirds. We are certainly not opposed to management of deer in these situations by a variety of means that result in reduced population densities.

However, with reference to some current proposals for management of deer on Jekyll Island (JI), particularly to the July 2014 "Jekyll Island White-tailed Deer Management Recommendations" report, we do not believe that the evidence at this time warrants a program of lethal control, nor that the latter would achieve the stated desired goals. In several respects, the deer population on JI represents a special case, which makes it incomparable to most areas on the mainland, or even to many other islands. This is a closed population without any recent history of significant predation or human harvest or control. It is quite likely that this population has therefore adapted certain life-history strategies to accommodate to these environmental circumstances. It has achieved a balance with this environment that gives it several population attributes that may be quite different from mainland populations. If it were to experience a sudden and sustained increase in human-caused mortality, this balance will be interrupted.

Below, we briefly detail some of the points with which we differ from the JIA in our assessment and interpretation of existing data on the deer population and habitat, and with proposed prescriptions for management.

1. Unless JIA is proposing that the JI deer herd should be henceforth and forever subject to annual hunter harvest, then using DNR management guidelines for "optimal" deer densities is irrelevant. These target densities are typically based on a maximum sustainable yield (MSY) management strategy to benefit recreational hunters, and MSY occurs at roughly half the carrying capacity of the habitat. Also, these guidelines are for forested habitats, not mixed

forest/urban habitats. In brief, it makes no sense to use a recreational hunting management model if JI is not to become a hunted population, and we don't believe that it will.

2. Population density estimates from 2011-2013 conducted by GaDNR/JIA and from 2014 conducted by USDA Wildlife Services (WS) vary quite widely from year to year, and are derived from surveys with questionable assumptions. Spotlighting deer at night in areas of known concentration (e.g., popular nocturnal feeding areas in "edge" habitat such as golf courses) does not provide a random sample of overall deer abundance (nor necessarily of buck/doe ratios) as they are distributed across all habitats. Basing density estimates on observed abundance in these areas where deer cluster and then extrapolating across all habitats provides an overestimate of the island-wide deer population. WS even acknowledges in its memo of 15 May 2014 that this method should be used only to compare year-to-year trends, and not as a reliable estimate of actual population. Yet, apparently ignoring that caveat (not to mention the fact that density estimates **declined** from 146/mi² in 2012 to 123 in 2013 to 76 in 2014!), WS leaps directly to the conclusion of "over-population" and the need for immediate lethal control. One cannot evaluate this recommendation in a vacuum, that is, without considering that lethal control is primarily what WS specializes in, and that half of their operating budget comes from contributions by groups and individuals that overwhelmingly favor lethal control as a preferred (and often, only) option (see Bergstrom et al. 2014, Conservation Letters, http://ww2.valdosta.edu/~bergstrm/Bergstrom%20et%20al%202014%20%28ConsLetters_print%29.pdf). One hires the exterminator not to decide whether to exterminate, but only after one has made the decision.

3. There currently is no credible evidence to rule in or out whether the population density is stable or changing, in either direction. At any rate, we know of no evidence of an increase in population, or an over-population, that would suggest an emergency requiring intensive management. According to the GSP, the number of road kills averages 7 per year, or according to JIA may be as high as 13 for the most recent year, but this represents no more than 2% of the population that JIA estimates. If road kill becomes a more serious problem, JIA should consider posting deer crossing signs, which apparently do not exist currently.

4. Alleged overbrowsing of native vegetation is not based on any long-term sampling nor reasonable null hypothesis (in what condition should natural vegetation be with the "ideal" deer population?). JIA acknowledges in its July 2014 Recommendations that long-term monitoring will be necessary to make this determination, yet the recommendations simply assume that significant damage has already occurred. Perhaps the most speculative of all the premature conclusions in the Recommendations is that there are 5 species of hardwood trees (although, we point out that "Tupelo" does not specify any one species but could be any of at

least 4 species of the genus *Nyssa*) that are “rare” on JI and that their rarity is primarily caused by deer browsing. Although no survey has yet been done, some or all of these species will be rare on JI because it is a small island, geologically young, with nutrient-poor soils and very little habitat for some of these species. *Gordonia lasianthus*, for example will be found only in bay swamps, which constitute small, isolated habitats on JI. We are uncertain of what is meant by “Chestnut Oak” in the report, as that is the accepted common name for *Quercus prinus*, which does not occur in the coastal plain of Georgia. Swamp chestnut oak (*Q. michauxii*) is a subdominant tree in the mesic hardwood hammocks of the coastal plain (e.g., Lewis Island in the lower Altamaha River), which themselves are rare habitats. If it occurs on JI, it would indeed be a rare tree. To know whether these or other plants on JI are actually threatened by deer browsing, we would echo the March 2013 recommendation of the JIA Director of Conservation (p. 20 of the July 2014 Recommendations) that fenced exclosures around areas occupied by these plants be established, along with equivalent controls, and that baseline plus annual surveys be undertaken to determine if there is a deer-browse effect on these species. This recommendation seems to have been ignored in the 2014 conclusions.

5. Internal parasite loads have not appreciably changed over the 21-year period between SCWDS investigations of two small samples of JI deer, and do not indicate a disease risk, certainly none that could impact humans directly or indirectly. They may impact fecundity (see #5). The JIA argument that deer need to be preventively culled in order to reduce the likelihood of transmission of Lyme disease to humans is entirely speculative, especially without any direct evidence of the incidence of Lyme on JI, but also because the science is not at all clear that there is a direct causal relationship between deer density and incidence of Lyme borelliosis (nor even a *correlation* between deer abundance and Lyme prevalence; see Levi et al. 2012, Proc. Nat. Acad. Sci., <http://www.pnas.org/content/109/27/10942.full>), especially in the Southeast, where this question has received very little study.

6. The ratio of fawns to does was around 0.25, 0.5, and 0.36, respectively, in the 2011, 2012, and 2013 spotlight surveys and as low as 0.12 in the JIA’s 2013 camera survey. Although variable, all of these estimates are remarkably low, and are evidence that this closed, island population, in the absence of predators, and subsisting largely on low-nutrient browse, is reproductively suppressed. Thus, this is a population at carrying capacity that is self-regulating via reduced fecundity and consequently very little recruitment. Any significant reduction in the population size may only release the population from resource limitation and cause an increase in fecundity and recruitment, leading to a younger age distribution and potential for a higher growth rate. This compensation will mean that instituting a significant harvest or lethal control will trigger a positive feedback loop of population growth followed by the continuous need for population reduction.

It must be recognized that there is a common sentiment among some in the profession that death of “game” animals (although, curiously, not so much of “nongame” wildlife) by natural causes, or even naturally suppressed reproduction in a population, is unacceptable and that death by human harvest is more “humane.” This is a biased opinion, based more on the comfort zones of the people who hold it than on science. Island populations are well known to ecologists and evolutionary biologists as living laboratories of how organisms repeatedly evolve novel adaptations in the absence of enemies that exert control over them on mainlands; consider the flightless cormorants of the Galapagos Islands. Two islands to the north of Jekyll, a Harvard researcher discovered that the opossums of Sapelo have adapted to a life without predators (and road kill), and the consequently much lower mortality on Sapelo Island has led opossums there to mature at half the speed and live twice as long as their mainland cousins. <http://blogs.discovermagazine.com/loom/2011/02/15/the-price-of-youth-my-darwin-day-2011-lecture/#.VBX0GhDtNVA>

Although no one has studied it, it is quite likely that the island deer of Jekyll have evolved in a similar way, perhaps with longer lifespan, slower reproductive maturation and lower fecundity as resulting adaptations to this unique environment. If this is the case, is it right for us to cause them to “devolve” back to a “mainland” lifestyle by suddenly introducing and then sustaining a high level of human-induced mortality? Must we pity the flightless cormorants, or the elderly opossums of Sapelo?

Rather than embarking on a program of lethal control at this time, we would encourage more targeted and long-term studies of the deer population and habitat on JI. A better, more random, protocol for estimating population size (e.g., a capture-mark-recapture method, which could involve camera “traps”) should be employed to achieve more accurate estimates. Opportunities for necropsy of road-killed deer could assess ovulation rates in does (and confirm or reject the hypothesis of fecundity suppression).

We find it somewhat counter-intuitive for JIA to invoke the “Precautionary Principle” (PP) of conservation as a justification for taking a new and unprecedented action with respect to the JI deer population. The PP is analagous to the hippocratic oath of the medical profession, which posits, “first, do no harm.” In the proceedings of a recent International Symposium *Uncertainty and Precaution in Environmental Management* (2005; <http://www.nusap.net/downloads/articles/upemsumiemss2004.pdf>), the following points are made about the PP:

1) when a newly proposed action goes against public sentiment, “The proponent of the activity, rather than the public, should bear the burden of proof [that the action does not pose a danger of environmental harm].” [page 3]

2) “information gathering, systematic long-term monitoring, and learning, is seen as essential to any precautionary approach to environmental management.” [page 9]

In line with this view, we point out that the proposal to hire federal government sharpshooters will be very controversial among many members of the public, will receive negative media coverage, and may have unintended negative consequences as discussed above. In light of these issues, proposed lethal control of this population with a long history of no predation and no human harvest would constitute an extraordinary measure and, as such, should require extraordinary proof that such intensive management is necessary. We do not feel that burden of proof has been met, and moreover, we predict that proposed lethal control either will not achieve the stated objectives, or will only do so at a cost of committing to a much higher rate of harvest that must be repeated periodically for an indefinite number of years. Doing the latter could mean committing to a slippery slope of intensive management that would fundamentally alter the character of this unique tourist destination.

Please do not hesitate to contact us should you have any additional questions about these comments or wish us to provide any additional information related to the JI deer population.

Sincerely,

Brad Bergstrom, Ph.D.
Professor of Biology
Valdosta State University
Valdosta, GA 31698-0015
bergstrm@valdosta.edu
229-333-5770

Sid Painter, M.S.
Wildlife Biologist, retired
Georgia Dept. of Natural Resources
330 Camelot Circle NW
Calhoun, GA 30701
706-629-4854
912-635-3015