United States Department of the Interior
U.S. GEOLOGICAL SURVEY
Reston, VA 20192

TAKE PRIDE IN AMERICA

In Reply Refer To:
Mail Stop 300

JUL 20 2010

Mr. Andrew Wyatt
President, United States Association of Reptile Keepers
P.O. Box 279
Grandy, NC 27939-0279

Dear Mr. Wyatt:

The U.S. Geological Survey (USGS) received your complaint (by electronic email on May 3, 2010 and by courier on May 6) about information quality and request for correction regarding Open –File Report 2009-1202, titled "Giant Constrictors: Biological and Management Profiles and an Establishment Risk Assessment for Nine Large Species of Pythons, Anacondas, and the Boa Constrictor".

In the separate attachment, the authors of Open-File Report 2009-1202 have responded to each of the detailed correction requests. I have reviewed their responses and determined that they meet the requirements of the Information Quality Act (IQA). Where appropriate, the authors are making corrections in an Errata Sheet that will be made available online on the same website where the full report is available.

There is an appeal process available to you if you are dissatisfied with the decision regarding your request. The procedure for this process is found on the USGS information quality web site at http://www.usgs.gov/info_qual/.

Thank you for your interest in this important topic.

Sincerely,

Susan Haseltine

Susan D. Haseltine
Associate Director for Biology

Attachment

<u>USGS response to USARK/PIJAC IQA challenge - Reed & Rodda</u>

<u>Correction Request #1:</u> Request correction of the Constrictor Report to comply with the OMB Final Bulletin for Peer Review for highly influential scientific assessments

1. **by using only reviewers who meet the NAS Policy for evaluating conflicts;**
2. **by requiring the scope of the review instructions given to peer reviewers to be consistent with that required under the OMB Final Bulletin.**

USGS Response: This document was not designated by the USGS process as a highly influential scientific document under the OMB provisions. In conducting its science, the USGS strives to provide unbiased, objective scientific information. To ensure objectivity, the USGS peer review standards require a minimum of two independent scientific reviews for every USGS publication, which was exceeded in this case. Research managers and independent scientists assess the author's responses to reviews to ensure those responses are adequate. We believe that the USGS process provided a satisfactory peer review of this document. No correction is needed.

<u>Correction Request #2:</u> Request that the Constrictor Report be corrected to provide transparency including sufficient data and information on methods that would allow a qualified third party to reproduce the results of the Tables 10.1 through 10.7 of Chapter 10, Risk Assessment.

USGS Response: The introduction, methods and results chapters of the Constrictor Report, along with the Aquatic Nuisance Species Task Force (ANSTF) guidelines extensively cited in those chapters, provide methodological information that is available and needed to reproduce Tables 10.1-10.7. The risk assessment chapter (Chapter 10) synthesizes and uses information cited from scientific sources and discussed in previous chapters of the report to conduct the risk assessment. Because the report and the literature referenced therein already contain all of the information needed for this specific request, no correction is needed.

Correction Request #3: Request that the Constrictor Report be corrected to:

1. **Identify the basis for failure to use the results of published peer reviewed scientific models for potential expansion.**

   USGS Response: The authors considered and cited the results of all published studies modeling the potential distribution of giant constrictors in the USA known to them at the time of writing. When there were discrepancies between multiple peer reviewed results, the authors noted and cited the conflicting peer-reviewed document, applied their best judgment and noted the uncertainty or caveats implied by the conflicting literature. No correction is needed.

2. **Provide sufficient transparency regarding data and methods to allow a qualified third party to reproduce the climate matching which is the basis of the report.**

   USGS Response: The methods used by Reed and Rodda are described in detail in Chapter 2 and are replicable. Using data from the literature cited in Chapters 4-9, others should be able

to follow the methods described in the report to obtain results that are extremely similar, if not identical to those presented in the report. No correction is needed.

3. Acknowledge and apply the findings of the multiple studies and empirical information, which indicate that Burmese pythons are less cold tolerant than the Constrictor Report asserts.

USGS Response: The report does not specifically address cold tolerance of individual Burmese pythons, as the only values used in climate matching are the mean monthly ambient temperatures for the active period of occupied areas, under two hypotheses of hibernation duration. These are ecological characteristics of a population, not physiological tolerances. While Reed and Rodda attempted to bracket the climatic conditions of the active period, they did not make any assertions regarding weather or cold tolerance of Burmese pythons. The appellant offers no examples of relevant peer-reviewed literature or findings that were available at the time the report was being prepared and which were omitted. No correction is needed.

4. Include data where available, that demonstrate species do not survive in areas in the United States which the model identifies as suitable for habitation.

USGS Response: The results of Reed and Rodda climate matching do not identify areas that are 'suitable for habitation'; instead, they depict areas of the United States that exhibit climatic conditions similar to those experienced by these species in some part of their respective native ranges. Habitat includes many other factors such as food supply, microhabitat, etc. not addressed in Reed and Rodda's climate matching methods, as explained in the report. No correction is needed.

5. Remove all statements that pythons and boas hibernate, or provide data supporting the statements.

USGS Response: Reed and Rodda asserted evidence of hibernation only in the case of the Indian Python. On page 52, Reed and Rodda cited six studies indicating hibernation by this species. The report refers to all peer-reviewed information relevant to this request. Therefore, no correction is needed.

<u>Correction Request #4:</u> Request that the Constrictor Report be corrected to remove the biased and/or speculative statements identified, as well as other equally unsupported statements (not enumerated, but available upon request from the authors of this Request for Correction), and replace them with statements based on data as required by the IQA and USGS Science Practices Policy.

"The occurrence of these three large constrictors [referring to Burmese Pythons, Northern African Pythons, and Boa Constrictors] in the wild in the same area of Florida may be a coincidence, but southern Florida has a climate that may be suitable for all of the giant constrictors and much of the commercial trade in giant constrictors passes through southern Florida." (Page 1; paragraph 1)

USGS Response: USGS does not perceive this statement to be biased, speculative, or contentious. This claim is intended only to explain why Florida is so often mentioned throughout the text. The authors simply noted that Florida is an important part of the trade. No correction is needed.

"This document addresses primarily the biological impacts associated with potential colonization of the United States by any of the nine giant constrictors. . . . " (Page 2; paragraph 4)"

USGS Response: The appellants assert that this statement implies that "many portions of the United States are in danger of colonization by at least one of the giant constrictors." The statement indicates that the scope of the report is the United States and does not imply anything about the sizes of potential ranges of the species assessed. No correction is needed.

"All of the species under consideration can probably move large distances over short periods when so inclined. These two factors combine to make it hard to limit the spread of their colonies." (Page 6; paragraph 2)

USGS Response: This statement was preceded by the observation that these constrictors are among the most fecund of snakes (a statement not contested by the appellants). Thus the second sentence in the quoted passage refers ("two factors") to the combination of high fecundity and rapid individual movements. Note that the point of the quoted passage is to assert that rapid spread complicates containment of the population. The appellants do not appear to take issue with that conclusion, but with the premise that populations of the focal species can in fact spread relatively rapidly. The appellants state that the climate match results in the Reed and Rodda report would require that pythons "migrate" across inhospitable terrain. This is an incorrect interpretation of the report. Reed and Rodda did not address the question of migration as there are insufficient data to do so. Areas of the United States judged to be at risk of population establishment (based on climatic similarity with the native range) would be at risk regardless of whether snakes dispersed into the specified area under their own volition or were released by humans into that area. Note that the quoted passage is taken from the summary. This topic is more fully explicated in the main text (e.g., see page 65 for a description of individual movement rates and the high fecundity rate of Burmese and Reticulated pythons). No correction is needed.

"Knowledge of the biology of these giant constrictors may be scanty, but knowledge of appropriate management tools for these species is almost nonexistent. Thus for the management profiles we relied to varying degrees on inference from the management of other snake species, primarily the Brown Treesnake in Guam and the Habu in the Ryukyu Islands .... " (p. 9; paragraph 3)

USGS Response: Using data from surrogate species is commonplace practice in the management of invasive species and Reed and Rodda presented the best available management information. No correction is needed.

"The presence of a novel predator on rare birds is likely to be detrimental to bird watching tourism if pythons reduce populations and thus reduce sighting rates." (Page 139; paragraph 3)

USGS Response: The appellant's objection to this inference is that subsequent citations note the devastation of the Guam avifauna by the introduced Brown Treesnake. The works cited by Reed and Rodda are germane in that they are an example of damaged caused by exotic species, but they make no claim of an exact parallel. The appellant claims that because Reed and Rodda cited a very damaging scenario, they were implying a similar level of damage, specifically to the continental United States and even more specifically to the Everglades. No such implication is apparent in the quote that was provided. No correction is needed.

Regarding the request to correct other "equally unsupported statements (not enumerated)", we have not identified any such statements to be addressed.

Correction Request #5: Request that the Constrictor Report be corrected to: identify the Burmese python (*P. bivittatus*) and Indian python (*P. molurus*) as a full species; assess the invasion risks of the two species separately using data specific to the species addressed.

USGS Response: The appellants cite a paper that was not available during preparation of the Reed and Rodda report (Jacobs et al. 2009) to justify splitting the Burmese and Indian pythons into two separate species. However, Jacobs et al. do not present new data and restate a position taken by taxonomic splitters throughout the 20th century, but their conclusions contradict those of others in the literature (both viewpoints were cited in the report: p. 43). Thus this viewpoint was not overlooked in preparation of the Reed and Rodda report, but represented by earlier publications. It is also important to note that these two forms (whether considered species or subspecies) are not appreciably different in their cold tolerance according to the peer-reviewed literature and the climate matches of the two forms are virtually identical with regard to cold. This is clearly illustrated by Fig. 4.3 (page 51), which shows both orange (*P. m. molurus*) and red (*P. m. bivittatus*) lines extensively commingled at the cold end of the climate space. No correction is needed.

Correction Request #6: Request that the Constrictor Report be corrected to clarify that South African Pythons, Beni Anacondas or DeShaunsee's Anacondas are not known to exist or to have been imported into the United States.

"We obtained CITES records of imports to the United States from 1977 through 2007 for the species of interest; results are presented in the Appendix and include records of over 1,100,000 individuals of these species imported to the United States during this period." (Page 14; paragraph 4)

USGS Response: The quotation from the Reed and Rodda report was taken from the Materials and Methods chapter, an inappropriate place to provide results. Results are given in Section 8.0 (Pathway Factors: Pet Trade) of the chapters for each species, as well as provided in full in the Appendix. In the case of the Beni Anaconda (*Eunectes beniensis*), for example, the report states, "The Beni or Bolivian Anaconda (*Eunectes beniensis*) does not appear to be represented in international trade" (page 236). The report also states, "International trade in DeSchauensee's Anaconda appears to be virtually nonexistent, …" (page 206). A discussion of South African and North African python importation (Section 7.3.1, page 131 and Section 8.0, page 132)

indicate the uncertainty of some importation records. Since the report contains all of the information requested in this specific request, no correction is needed.

Correction Request #7: Request that the Constrictor Report be corrected to clarify that the three introduced boa constrictor populations are small and established within the existing geographic range of latitude and longitude.

USGS Response: This request for correction appears to be requesting additional detail and clarification rather than correcting any substantive errors. The requested additional information can be found in primary literature citations provided in Chapter 7. No correction is needed.

Correction Request #8: Request that references to reproduction of *Python sebae* be corrected to include data to support the statement and if no data is available, removed

USGS Response: This Correction Request refers to material in the Introduction on page 1 of the report. Supporting data are presented in Chapter 6, where Reed and Rodda discuss evidence for a population of *P. sebae* based on four documented specimens (including two hatchlings), a credible report of a fifth individual, and an unsubstantiated report of a sixth, all from a small area along the western border of Miami. The report states that, "A spatially concentrated cluster of sightings of pythons of various size classes is fairly strong evidence of a reproductive population and planning is underway to delineate and attempt control of this incipient population" (pages 120-121). No correction is needed.

Correction Request #9: Request correction of the speculative statements regarding the existence of hybridization between Burmese python and North African python.

USGS Response: The Reed and Rodda report does not state that such hybrids are present in southern Florida, but instead identifies that hybridization is "conceivable" because both species are established and that hybridization is known from captivity. In addition to the discussion on page 137, Reed and Rodda reported that, "The likelihood of hybridization among introduced Florida populations is unknown, as are the implications of genetic admixture for risk assessment and control purposes" (page 121). Stating that hybridization is "conceivable" is not biased, inaccurate, or incomplete. Because the likelihood of such hybridization events was judged to be unknown, this information was not used during the risk assessment, and did not influence results. No correction is needed.

Correction Request #10: Request correction of the speculative statements regarding hybridization between Yellow Anacondas and Green Anacondas.

> *"If hybrids are fertile and exhibit characteristics of both species (for example, cold tolerance of Yellow Anacondas but increased size from Green Anaconda genetic contributions), the resulting hybrid might represent higher risk as an introduced species. However, we judge such a scenario to be fairly unlikely." (Page 211; paragraph 2)*

> **USGS Response:** The Reed and Rodda report states that such hybridization is "conceivable" because hybrids have been reported from captivity, but that it is "fairly unlikely" in the wild. Additional discussion of hybridization among these species can be found on page 188 of the

report. Because such hybridization was judged to be unlikely, it was not used during the risk assessment, and did not influence results. No correction is needed.

"Imports [of anacondas] spiked in 1997 as compared to levels in preceding or ensuing years. It is likely that this spike was related to the 1997 release of the horror movie Anaconda, in which larger than-life anthropophagous anacondas consumed a variety of B-list movie stars. If the apparent relationship between the movie and import rates is more than a remarkable coincidence, such a spike implies that demand, not availability, drives the import rate of anacondas, and that suppliers can obtain more snakes from wild populations even within a short time period." (Page 236; paragraph 3)

USGS Response: USGS concludes that USARK was correct in stating that the Reed and Rodda report erred in reporting the timing of the relationship between the movie Anaconda and a spike in imports of Green Anacondas. However, this information was not used in any way during the risk assessment process, and thus did not influence results of the risk assessment. This error has been noted and will appear in an Errata Sheet that will be made available online on the same website where the full report is available.

Correction Request #11: Request that the following statements related to livestock predation be corrected and clarified to include data to support the amount and type of livestock predation currently occurring.

"Direct predation on livestock will occur if any of the giant constrictors become established in the United States. . . . This prediction is very certain because livestock losses have been widely documented in Florida (by Burmese Pythons, North African Pythons, and Reticulated Pythons). However, the extent of the damage is much less certain." (Page 255; paragraph 1)

USGS Response: Losses of livestock are reported in Sections 12.2 (Predator on livestock) and species lists of prey species known to be consumed are reported in Sections 10.3 (Prey availability) in the chapters for each of the species referenced in the quotation with literature citations. The quotation contains no implication that "prize bulls are being attacked and eaten out in the pastures" as stated in the appellants document. Data on the number of prey consumed of various species of livestock are not available. But, as stated in the report, although direct predation on livestock will occur with certainty, "the extent of the damage is much less certain" (page 255) and will vary among species of giant constrictor, with small-to-medium livestock, especially poultry, expected to be most heavily impacted. No correction is needed.

Correction Request #12: Request correction of reference to boas and pythons as 'giant' snakes as the term is scientifically indefensible and biased.

"As with most giant constrictors, the maximum size of the Boa Constrictor has been subject to exaggeration, especially in the older literature. Unfortunately, many of these claims of gigantic boas have been perpetuated by more recent authors. . . . Part of the confusion stems from misapplication of the name Boa Constrictor to other giant snakes, including anacondas and even some Old World pythons." (Page 148; paragraph 3)

"In the public mind, Boa Constrictors are considered a giant snake, but they are not particularly large in comparison to some of the true giants." (Page 176; paragraph 5)

USGS Response: The Merriam-Webster definition of the word 'giant', as applied to non-humans and non-mythical creatures, is "A living being of great size." It is true that the term 'giant' is subjective, as are similar terms such as 'large' and 'tiny'. However, referring to these snakes as 'giant' is warranted in comparison to other snakes. The Reptile Database (http://www.reptile-database.org/) reports that there are about 3,149 species of snakes worldwide. The largest members of this group are found within the families Boidae and Pythonidae, but even these families are predominately composed of relatively small-bodied species. Average-sized individuals of the nine species in the Reed and Rodda report would rank within the top 5%, if not 1%, of all snakes in terms of body mass. In comparison to virtually all other snakes, therefore, the nine species in the Reed and Rodda report meet the definition of being "of great size," and therefore can be termed 'giants' without any bias. No correction is needed.

Correction Request #13: Request that biased statements in the Constrictor Report regarding the consequences of establishment of these snakes be removed as they are incomplete and inaccurate.

> *"Predation on pets is likely to be of limited economic importance, but acutely felt by the bereaved pet owner" (Page 255).*
>
> **USGS Response:** This quote is presented in the context of the Economic Impact Potential of Chapter 10 of the Reed and Rodda risk assessment. The authors conclude in this section that predation on pets is unlikely to be of economic importance. Available information on predation on companion animals by the nine giant constrictors is presented earlier in the report. As examples of observations of predation on companion animals (specifically dogs and cats) in the literature and/or comments on the likelihood of such predation, see pages 56, 91, 92, 127, 128, 138, 179, 183, 230, 231, and 241 of the report. Predation on companion animals by giant constrictors is well documented in the literature. No correction is needed.
>
> *"Although it is difficult, or perhaps impossible, to fully quantify perceived impacts that have no overt economic or ecological impacts, it is notable that colonization by giant constrictors would affect human relations to the rural landscape significantly, and not in a good way. Perhaps a mother would no longer allow her children to explore the woods unescorted, or to swim in a creek. Perhaps a child would have fewer opportunities to experience the full range of native wildlife. Loss of these pivotal developmental opportunities comes at a cost that we can appreciate even if we cannot readily measure it" (Page 257).*
>
> **USGS Response:** USARK's objections to this quote appear to be based on the assumption that all introduced populations of giant constrictors in the United States will be confined to southern Florida and on the supposition that native animals that are dangerous to humans are found everywhere in southern Florida. In southern Florida, panthers are found only in some areas, alligators are largely confined to aquatic habitats, and eastern diamondback rattlesnakes have been eliminated from large portions of their former distribution. Introduced giant constrictors may not be subject to similar restrictions at regional or local scales, and a number of introduced giant constrictors have been removed from residential

areas. The Reed and Rodda report provides evidence that other parts of the United States exhibit climates similar to those in parts of the native range of some of the nine snake species examined, including Hawaii, southern Texas, and a number of insular territories or possessions. There is no evidence of bias or advocacy in the quoted text and no correction is needed.

"Another consideration on the use of volunteers is that unlike Brown Treesnakes, ***giant constrictors are potentially dangerous to hunters, and misidentification of snake species in the southern United States can lead to fatalities (Page 30; paragraph 3)****. Legal liabilities need to be addressed forthrightly and in advance." (Bolded text represents the quotation that was included in the USARK challenge, additional text from the Reed and Rodda report provided for context and clarity).*

USGS Response: The full quote refers to the potential of using volunteers to assist in eradication efforts of a widespread population of any of the nine snake species. The statement that misidentification of snakes can lead to fatalities refers to the possibility that a hunter will incorrectly identify a native venomous snake as a small python, possibly resulting in a fatal venomous bite. There is no bias implicit in this statement, but we agree that it could be misinterpreted and will add language to clarify this statement in an Errata Sheet that will be made available online on the same website where the full report is available.

"*Brown Treesnake economic damages are primarily a result of damage to electrical power circuits and supporting hardware such as transformers (Fritts and others, 1987; Burnett and others, 2006). Burnett and others (2006) projected potential Brown Treesnake annual power system losses of $4.5B in Hawaii; thus the magnitude of potential losses is appreciable. However, juvenile Burmese Pythons are less capable climbers than are Brown Treesnakes (adult pythons are too stout and heavy for climbing on wires), and thus the economic loss per unit of land area is likely to be appreciably less from pythons than from Brown Treesnakes.* ***We are not aware of any documented power line problems from the large population of Burmese Pythons in south Florida, and thus this problem may be no more severe than that already associated with power line movements by rat snakes****" (.Page 66; bolded text represents the quotation that was included in the USARK challenge, additional text from the Reed and Rodda report provided for context and clarity).*

USGS Response: Economic losses due to damage to electrical power systems are one of the primary economic impacts of the Brown Treesnake on Guam, and Reed and Rodda therefore examined whether any of the nine giant constrictors profiled in the report are likely to have similar impacts. Similar assessments can be found in the equivalent section (12.4, Electrical Power Systems) in each of chapters 4 through 9. The following quotes are examples of similar assessments from elsewhere in the report:

- "Pythons are unlikely to be nearly as adept at climbing utility poles as are Brown Treesnakes or other snake species with specialized adaptations for climbing. We expect python-associated damages to electrical grids to be minimal" (Page 138)
- "We do not expect introduced Boa Constrictors to appreciably elevate the rate of snake-caused power outages above the background level caused by native snakes" (Page 183)

- "The heavy build of this snake likely precludes it from being a particularly good climber, and we would expect minimal impacts to electrical power delivery networks" (Page 212).

There is no detectible bias in any of these statements regarding potential impacts on electrical power systems, nor is there any stated or implied advocacy for regulation. Instead, these quotes reflect the authors' judgment that economic losses due to damage to electrical systems are likely to be trivial. No correction is needed.

"Presence of such species in natural landscapes might also induce employers to institute measures such as are used in bear country, including special training, requirements for safety equipment, and/or requirements to travel in pairs in predator-occupied habitat" Page. 139)

USGS Response: There is no detectible bias in this quote, nor is there any stated or implied advocacy for regulation. Land management agencies have requested information on human interactions with introduced pythons. No correction is needed.

Correction Request #14: Request that the reference to 'large' boa populations in South Florida be supported with data and a definition of the word 'large' in this context.

"We are not aware of any documented power line problems from the large population of Burmese Pythons in south Florida, and thus this problem may be no more severe than that already associated with power line movements by rat snakes." (Page 66; paragraph 4)

USGS Response: Because the quotation provided by USARK refers to Burmese pythons, not boas, we assume that the Correction Request is also referring to Burmese pythons and that the term 'boa' was an inadvertent error. The National Park Service reports that 1,496 Burmese Pythons have been removed in and around Everglades National Park since the year 2000, with the majority removed in the last 5 years. Given low *individual* detection rates combined with the large *number* of pythons observed/captured in southern Florida, the conclusion that the population is 'large' is logical, regardless of which definition of the word 'large' one would choose to select. No correction is needed.

Correction Request #15: Request that the Constrictor Report be corrected to define 'entry potential' as the risk of entry potential into the natural environment.

USGS Response: The Reed and Rodda report employed the ANSTF (1996) risk assessment process. In this process, the Entry Potential component is the probability of the organism surviving in transit. The next element of the process is the Colonization Potential, which is the probability of the organism colonizing and maintaining a population. No correction is needed.

Correction Request #16: Request that the Constrictor Report be corrected to remove derogatory remarks.

"To our knowledge, illegitimate bites have never resulted in the ingestion of the human, probably because the bites were defensive in nature, intended merely to cause the human to stop bothering the snake (lethal constriction is effective for this)." (Page 93; paragraph 1, line 5)

"However, southern Florida has an acknowledged reputation for unsavory characters, both reptilian and otherwise." (Page 101; paragraph 1)

USGS Response: The first provided quote is intended to provide clarification and has no wording of a derogatory nature. The second quote reports an 'acknowledged reputation' rather than stating something as fact. Neither quotation influenced the risk assessment process. The first quotation requires no correction. The second quotation, however, will be addressed in an Errata sheet that will be made available online on the same website where the full report is available.

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