



United States Department of the Interior

U.S. GEOLOGICAL SURVEY
Office of the Director
Reston, Virginia 20192

In Reply Refer To:
Mailstop 300
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Mr. Andrew Wyatt, President
United States Association of Reptile Keepers
P.O. Box 279
Grandy, North Carolina 27939

Dear Mr. Wyatt:

This letter is in response to your September 3, 2010, appeal to the U.S. Geological Survey's (USGS) decision on your May 3, 2010, Information Quality Act (IQA) Request for Correction. Your request for correction concerned the following publication:

Reed, R.N., and G.H. Rodda, Giant Constrictors: Biological and Management Profiles and an Establishment Risk Assessment for Nine Large Species of Pythons, Anacondas, and the Boa Constrictor: USGS Open-File Report (OFR) 2009-1202.

In conducting the review, USGS staff members with the appropriate expertise evaluated your appeal request. The USGS is committed to providing unbiased, objective scientific information upon which other entities may base judgments. USGS scientific information is subject to a high degree of transparency about data and methods to facilitate the reproducibility of such information by other qualified scientists. This report has a high degree of transparency regarding: (1) the source of the data used, (2) the various assumptions employed, (3) the methods applied, and (4) the statistical procedures employed. To facilitate this transparency, the USGS has prepared a supporting Data Series (DS) report that includes: the locations used, the extracted climate values for the locations used to create the climate algorithms, the climate data layers, the algorithms, and the final shapefiles for the figures in the report created from implementing the algorithm with the climate data. The report, DS 579, entitled *Data for Giant Constrictors Biological and Management Profiles and an Establishment Risk Assessment for Nine Large Species of Pythons, Anacondas, and the Boa Constrictor*, was published online on March 11, 2011 (<http://pubs.usgs.gov/ds/579/>).

A detailed response to your September 3, 2010, IQA appeal is provided in a separate enclosure. This correspondence completes the appeal process for your May 3, 2010, IQA Request for Correction. We appreciate your consideration of these issues and thank you for your interest.

Sincerely,

Marcia McNutt
Director

Enclosure

U.S. Geological Survey (USGS) Response to the United States Association of Reptile Keepers (USARK) Information Quality Act (IQA) Request for Correction Appeal, September 3, 2010

RE: *Reed, R.N., and G.H. Rodda, Giant Constrictors: Biological and Management Profiles and an Establishment Risk Assessment for Nine Large Species of Pythons, Anacondas, and the Boa Constrictor: USGS Open-File Report (OFR) 2009-1202.*

Correction Request 1: In reviewing the material submitted in the September 3, 2010, IQA appeal, the USGS has determined that OFR 2009-1202 meets the standards set forth in the Office of Management and Budget's Final Information Quality Bulletin for Peer Review and the USGS Fundamental Science Practices guidelines. The USGS requires independent scientific review for every publication. USGS OFR 2009-1202 meets those standards. The authors of the report solicited reviews from 20 reviewers (18 external to the USGS), who comprise a large portion of the global expertise on the biology of giant constrictor snakes and management of invasive snakes. The enclosed letter posted online January 23, 2010, at NATGEO Newswatch, describes the review process.

Correction Request 2: The OFR risk assessment is based upon a peer reviewed, published, commonly-used risk assessment methodology (Aquatic Nuisance Species Task Force (ANSTF), 1996). Regarding the transparency of the material, and the ability of a third party to reproduce the results outlined in the risk assessment, the USGS believes that the OFR provides sufficient information for a qualified party to substantially reproduce the results of the risk assessment process.

Correction Request 3: In response to the issue regarding the climate matching model, the USGS response to the May 3, 2010, IQA Response for Correction noted that the authors considered and cited results of all published studies regarding modeling the potential distribution of giant constrictors. The authors also noted and discussed when there were discrepancies between multiple peer-reviewed results.

Additionally, an IQA Request for Correction from a member of the public was submitted to the USGS on July, 26, 2008, regarding the publication, *What parts of the U.S. mainland are climatically suitable for invasive alien pythons spreading from Everglades National Park?* (Rodda et al., 2008) (published in *Biological Invasions*, online in 2008, and in paper copy in 2009). This 2008 IQA Request for Correction followed the publication of a paper contradicting the modeling effort, *Claims of potential expansion throughout the U.S. by invasive python species are contradicted by ecological niche models* (Pyron et al., 2008) (published in *PLoS ONE*, online in 2008). In responding to that 2008 IQA, the USGS convened a panel of scientists (from within the USGS and the U.S. Fish and Wildlife Service) to address concerns about "unwarranted assumptions and defective methodologies." The panel determined that Rodda et al., 2008, met the requirements for independent peer review, was unlikely to contain unwarranted assumptions or defective methodologies, and was a good example of scientific dialog regarding model application that provided an opportunity for different points of view to work through the scientific method. Specifically, the panel found that the Rodda et al., 2008, modeling paper was "technically correct, unbiased and objective, requiring no need for modification" (final USGS response to appeal, January 5, 2009).

Additionally, a recent paper, (published in PLoS ONE online, in 2011) *Challenges in identifying sites climatically matched to the native ranges of animal invaders* (Rodda et al., 2011), further evaluated the results of Pyron et al., 2008, and found them to be based on erroneous data input and an incorrect use of the MaxEnt model. These errors and incorrect use of the model resulted in Pyron et al., 2008, predicting only very limited climatic suitability (places where the snake could potentially survive based on climate alone) for these python species in the continental United States, in contrast to the previously-published paper by Rodda et al., 2008, that projected climatic suitability over a much larger area of the southern United States.

The discrepancies identified in the material presented in Appendix C (which the appellant indicates supports the claim that using weather stations to model climate tolerance served to increase the range of species) have also been addressed in Rodda et al., 2011. In this publication, the authors modeled the climate space using the exact same methods as the original modeling effort, except that they used specimen locations of the species (98 specimen locations) rather than weather station locations. A small systematic bias was noted, but in the opposite direction than that claimed by the appellant--the original estimates were slightly more conservative. This effort indicates that using either weather stations or specimen locations to model climate tolerance will produce very similar results.

There is also a disagreement between the range map of the appellants and the range map used by the USGS authors in the OFR 2009-1202 risk assessment. The range map used by the USGS was taken from published sources and reviewed by relevant experts in the field, we therefore conclude that it is a credible assessment. Note that the authors clearly identified climate matching as only one element in the risk assessment and not the basis of the assessment. The risk assessment cautions against using climate matches too literally. On page 15, the document states, "Please note that climate matching is a rapidly evolving field of endeavor and some methods will no doubt prove unreliable and be discarded in favor of methods not yet invented. We believe that the current tools should be relied upon to give an indication of the relative size and location of the geographic area at risk, but should be used only with great circumspection to identify specific localities at risk." The USGS also believes that the methods and analysis for the climate matching model are described sufficiently to allow for reproducibility. The USGS typically provides supporting data on request or through publication as appropriate. To increase transparency, the USGS has prepared a Data Series report (DS 579) entitled, *Data for Giant Constrictors Biological and Management Profiles and an Establishment Risk Assessment for Nine Large Species of Pythons, Anacondas, and the Boa Constrictor*, which is available at <http://pubs.usgs.gov/ds/579/>. This report should facilitate any effort to reproduce the climate matching model.

Regarding hibernation, the USGS authors provided appropriate references that support their supposition that these species may hibernate.

Correction Request 4: Our review of the information regarding those statements identified as biased or speculative found that the original USGS response to the May 3, 2010, IQA Request for Correction adequately addressed these claims. The statements in question had supportive references cited or additional explanation of their limitations was referenced in the report when available or they were appropriately qualified. The appellant also requested that the USGS

respond to additional “unsupported statements” that were not part of the original IQA Request for Correction (May 3, 2010). The appeal requests that the USGS provide firm documentation for the assertions (as data for each of the nine species) or remove them as unwarranted speculation. Our review of these additional “unsupported statements” found that the authors presented the firm data (when available) and cautiously drew reasonable inferences based on the scientific literature that are cited in the report as appropriate.

Regarding the statement on potential spread and colonization, as previously noted, on page 15, OFR 2009-1202 states, “We believe that the current tools should be relied upon to give an indication of the relative size and location of the geographic area at risk, but should be used only with great circumspection to identify specific localities at risk.”

Correction Request 5: As identified in the original response, the Jacobs et al., 2009, paper does not present any new data and restates a position that earlier publications have also taken regarding the separation of the Burmese and Indian python into two species. Other literature evaluated in OFR 2009-1202 considers the two as subspecies and the report reviews both positions. The USGS believes that the authors of the report adequately reviewed this position and provide appropriate justification for considering these as subspecies.

Correction Request 6: USGS review of the appeal request found that the statement in question is a summary statement for imports of constrictor species that is located in the Material and Methods section of the report. It is clearly referenced, accurately cites a table where the data on importation resides, and does not imply that all species were among those imported (the table clearly shows this). Our review indicates that the statement from the report is not incorrect and the original USGS response attempted to clarify this point.

Correction Request 7: USGS review of the information on the three introduced boa constrictor populations found that it is clear and complete. The authors discuss in detail each of the three populations and reference appropriate available data.

Correction Request 8: USGS review of the appeal request finds that the original statement regarding the reproduction of *Python sebae* (North African Python) is supported by the discussion in the report. Several recent publications substantiate the data that exists to support the statement (Reed et al., 2010; Reed and Rodda, 2011).

Correction Request 9: USGS review of the appeal material indicates that the discussion in the report regarding hybridization between the Burmese python and the North African python is based on reasonable inferences drawn from the literature.

Correction Request 10: The discussion on hybridization between yellow and green anacondas is supported by the discussion in OFR 2009-1202 on page 188. Our review finds that the authors qualified their discussion appropriately.

Correction Request 11: The authors provided references to livestock losses for Burmese and North African pythons in Section 12.2 of Chapters 4 and 6. The reference for the Reticulated python was based on a news account by a witness’ supposition rather than a demonstrable fact;

therefore, we will remove the reference to the Reticulated python and note such in an errata sheet.

Correction Request 12: The term ‘giant’ is commonly used in the industry and by scientists and does not imply bias or inaccuracy.

Correction Request 13 and 14: The National Park Service data on the number of Burmese pythons that have been removed from the area around the Everglades National Park since 2000 can be found at <http://www.nps.gov/ever/naturescience/burmesepython.htm>.

Correction Request 15: The authors correctly applied the Entry Potential component of the risk assessment process following the process described in the ANSTF 1996 document. Other risk assessments using the ANSTF 1996 process have interpreted the Entry Potential in the same manner as the authors of this report (Nico et al., 2005; Courtenay and Williams, 2004).

Correction Request 16: The USGS does not believe the first quotation is derogatory. The second quotation, as noted in the original response, has been addressed in the errata sheet.

References:

- Aquatic Nuisance Species Task Force. 1996. Generic nonindigenous aquatic organisms risk analysis review process (for estimating risk associated with the introduction of nonindigenous aquatic organisms and how to manage for that risk): Washington, D.C., Aquatic Nuisance Species Task Force, 32 p.
- Courtenay, W.R., Jr., and J.D. Williams. 2004. Snakeheads (Pisces, Channidae) – A Biological Synopsis and Risk Assessment. U.S. Geological Survey Circular 1251.
- Nico, L.G., J.D. Williams, and H.L. Jelks. 2005. Black carp: biological synopsis and risk assessment of an introduced fish. American Fisheries Society, Special Publication 32, Bethesda, Maryland.
- Reed, R.N., K.L. Krysko, R.W. Snow, and G.H. Rodda. 2010. Is the Northern African Python (*Python sebae*) established in southern Florida? *IRCF Reptiles and Amphibians* 17:52-54.
- Reed, R.N., and G.H. Rodda. 2011. Burmese Pythons and other giant constrictors, p. 85-91. *In* D. Simberloff, and M. Rejmanek [eds.], *Encyclopedia of invasive introduced species*. University of California Press, Berkeley, California.
- Rodda, G.H., C.S. Jarnevich, and R.N. Reed. 2009. What parts of the U.S. mainland are climatically suitable for invasive alien pythons spreading from Everglades National Park? *Biological Invasions*, v. 11, p. 241–252 (published in *Biological Invasions* online February 27, 2008).
- Rodda, G.H., C.S. Jarnevich, and R.N. Reed. 2011. Challenges in identifying sites climatically matched to the native ranges of animal invaders. *PLoS ONE*, v.6, no. 2, p. e14670. doi:10.1371/journal.pone.0014670.
- Pyron, R.A., F.T. Burbrink, and T.J. Guiher. 2008. Claims of potential expansion throughout the U.S. by invasive python species are contradicted by ecological niche models. *PLoS ONE*, v. 3, no. 8, p. e2931.
- USGS defends study that suggests U.S. climate may become accommodating to giant alien snakes; <http://blogs.nationalgeographic.com/blogs/news/chiefeditor/2010/01/usgs-defends-study-thast-sugge.html>
- Final USGS response to appeal; 1/05/2009
http://www.fort.usgs.gov/InfoQuality/MTF21972/FinalAppealResponse_090210.pdf

January 7, 2010

Dear Mr. Braun:

This letter is written in response to your blog post of 07 December 2009, regarding a press release issued by a reptile-trade organization and an accompanying letter by a group of veterinarians and other scientists. The article and letter criticized the following recently released report (Reed and Rodda, 2009) written by U.S. Geological Survey (USGS) scientists: http://www.fort.usgs.gov/products/publications/pub_abstract.asp?PubID=22691. Some of the information in the letter from Dr. Jacobson and fellow scientists appears to be based on a misunderstanding of the USGS peer review process.

The USGS provides unbiased, objective scientific information upon which other entities may base judgments. To ensure objectivity, independent scientific review is required of every USGS publication. Standards require a minimum of two reviews and adequacy of the author's responses to reviews is assessed by both research managers and independent scientists within the USGS.

For the report referred to in the blog, the authors went well beyond the requirements by soliciting reviews from 20 reviewers (18 of them external to the USGS). Reviewers comprised a large portion of the global expertise on both the biology of giant constrictor snakes and the management of invasive snakes. In addition, the climate-matching methods presented in the report were previously published in the peer-reviewed journal *Biological Invasions* in early 2009 (Rodda et al., 2009), so these methods have received both USGS peer review and standard journal peer review. Scientific papers with divergent or competing views on issues are very common and contribute to advancing scientific processes. The *Biological Invasions* paper had been criticized in a subsequent publication (Pyron et al., 2008). In the current USGS report, the authors addressed the limitations of the methods utilized in the Pyron et al. (2008) paper.

The USGS report reviewed virtually all of the peer-reviewed literature on giant constrictor biology, as well as much of the literature on snake management (a total of 671 papers and books) and survival in the wild. The report has received favorable review by other invasion biologists including one written by one of the world's most respected experts in invasive species biology (Dan Simberloff, Ph.D., Univ. Tennessee). The review (Simberloff, 2009) recently appeared in the journal *Biological Invasions* and can be found here: <http://www.springerlink.com/content/n85h7u0871t12408/fulltext.pdf>. With regard to climate matching in particular, Simberloff praised the "excellent discussion of the differences between and relative merits of climate matching approaches and environmental niche models that would constitute a good introduction to this burgeoning literature for any graduate student and most practicing invasion biologists."

While allegations have been made that the USGS report is being used as the justification for regulations on the reptile trade, it is important to note that the report offers no recommendations on policy or legislation.

Thank you for the opportunity to offer clarification on these issues.

Sincerely,

Dr. Susan Haseltine
Associate Director for Biology, USGS

References:

- Reed, R.N., and Rodda, G.H. 2009. Giant constrictors: biological and management profiles and an establishment risk assessment for nine large species of pythons, anacondas, and the boa constrictor. U.S. Geological Survey Open-File Report 2009-1202. 302 p.
- Rodda, G.H., Jarnevich, C.S., and Reed, R.N. 2009. What parts of the U.S. mainland are climatically suitable for invasive alien pythons spreading from the Everglades National Park?: *Biological Invasions*, v. 11, p. 241-252. (published online 27 February 2008)
- Pyron, R.A., Burbrink, F.T., and Guiher, T.J. 2008. Claims of potential expansion throughout the U.S. by invasive python species are contradicted by ecological niche models: *PLoS ONE*, v. 3, no. 8, p. e2931.
- Simberloff, D. 2009. Book Review: R.N. Reed and G.H. Rodda (eds): *Giant constrictors: biological and management profiles and an establishment risk assessment for nine large species of pythons, anacondas, and the boa constrictor*. *Biological Invasions* 10.1007/s10530-009-9643-9.