



**STRENGTH IN NUMBERS...PROTECT YOUR RIGHTS.**

**Before the United States Department of the Interior  
United States Geological Survey  
Washington, D.C.**

<p>UNITED STATES ASSOCIATION OF REPTILE KEEPERS</p> <p>v.</p>	<p>September 3, 2010</p>
<p>UNITED STATES DEPARTMENT OF THE INTERIOR</p>	<p><b>Information Quality Act Appeal to U.S. Geological Survey for Dissemination of Information in the "Giant Constrictors: Biological and Management Profiles and an Establishment Risk Assessment for Nine Large Species of Pythons, Anaconda, and the Boa Constrictor" (Report).</b></p>

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**APPEAL OF THE UNITED STATES ASSOCIATION OF REPTILE KEEPERS  
PURSUANT TO THE INFORMATION QUALITY ACT, SECTION 515 OF THE  
TREASURY AND GENERAL GOVERNMENT APPROPRIATIONS ACT FOR FISCAL  
YEAR 2001(Pub. L. No. 106-554; H.R. 5658)**

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**To: Dr. Marcia McNutt, Director**  
**Attention: Mr. Kevin Gallagher, Associate Director, Geospatial Information Office**  
**United States Geological Survey**  
**National Center - 12201 Sunrise Valley Drive**  
**Reston, VA 20192**

## INTRODUCTION

This Appeal of the Request for Correction of Information (Request)<sup>1</sup> is hereby submitted under the Information Quality Act (IQA)<sup>2</sup>, Guidelines issued by the United States Department of the Interior (DOI)<sup>3</sup> and the U.S. Geological Survey (USGS)<sup>4</sup>, and the Office of Management and Budget (OMB)<sup>5</sup>, as well as the Final Information Quality Bulletin for Peer Review (Final Bulletin) issued by OMB<sup>6</sup> as informed by the USGS review and assurance policies<sup>7</sup>. The OMB Guidelines and Final Bulletin provide the blueprint for the agencies subject to the IQA mandates, and these agencies, including the USGS, have adopted administrative measures that are primarily procedural in nature, but incorporate OMB's substantive requirements as well. For purposes of this Appeal, we refer collectively to DOI's department wide Guidelines, OMB's Guidelines and Final Bulletin and USGS Guidelines and Policies as USGS IQA Guidelines since they are all applicable to this matter.

The United States Association of Reptile Keepers (USARK) is an affected organization and our members are affected persons within the meaning of the USGS IQA Guidelines. USARK is a nonprofit, science and education based advocacy for the responsible private ownership of, and trade in reptiles. We endorse caging standards, sound husbandry, escape prevention protocols, and an integrated approach to vital conservation issues. Our goal is to facilitate cooperation between government agencies, the scientific community, and the private sector in order to produce policy proposals that will effectively address important husbandry and conservation issues. The health of these animals, public safety, and maintaining ecological integrity are the primary concern of our organization.

This Appeal, including this cover document and all Appendices, which are hereby incorporated by reference, is filed in response to a letter dated July 20, 2010 from Susan Hazeltine, Associate Director for Biology, to Andrew Wyatt, President of USARK (USGS Letter). The USGS Letter is unresponsive and dismissive of our myriad ongoing concerns with the flaws in the above entitled Report; flaws which have not been corrected despite our request for correction and the similar

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<sup>1</sup> See Appendix A for the original Request for Correction filed by the USARK.

<sup>2</sup> Section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001 (Pub. L. No. 106-554; H.R. 5658) provides in full the following:

(a) IN GENERAL.—The Director of the Office of Management and Budget shall, by not later than September 20, 2001, and with public and Federal agency involvement issue guidelines under sections 3504(d)(1) and 3516 of title 44, United States Code, that provide policy and procedural guidance to Federal agencies for ensuring and maximizing the quality, objectivity, utility, and integrity of information (including statistical information) disseminated by Federal agencies in fulfillment of the purposes and provisions of chapter 35 of title 44, United States Code, commonly referred to as the Paperwork Reduction Act.

(b) CONTENT OF GUIDELINES.—The guidelines under subsection (a) shall (1) apply to the sharing by Federal agencies of, and access to, information disseminated by Federal agencies; and (2) require that each Federal agency to which the Guidelines apply (A) issue guidelines ensuring and maximizing the quality, objectivity, utility, and integrity of information (including statistical information) disseminated by the agency by not later than 1 year after the date of issuance of the guidelines under subsection (a); (B) establish administrative mechanisms allowing affected persons to see and obtain correction of information maintained and disseminated by the agency that does not comply with the guidelines issued under subsection (a); and (C) report periodically to the Director (i) the number and nature of complaints received by the agency regarding the accuracy of information disseminated by the agency; and (ii) how such complaints were handled.

<sup>3</sup> 67 Fed. Reg. 36642(May 24, 2002).

<sup>4</sup> Available at [http://www.usgs.gov/info\\_qual/](http://www.usgs.gov/info_qual/)

<sup>5</sup> Guidelines for Ensuring and Maximizing the Quality, Objectivity, Utility, and Integrity of Information Disseminated by Federal Agencies, 67 Fed. Reg. 8452(republished Feb. 22, 2002).

<sup>6</sup> 70 Fed. Reg. 2664(Jan. 14, 2005).

<sup>7</sup> These quality review standards are published by the USGS at <http://www.usgs.gov/usgs-manual/500/502-4.html>. For more information about the review, approval, and release of USGS science information products, refer to the USGS Fundamental Science Practices Web site at <http://www.usgs.gov/fsp/>.

concerns raised in the myriad comments to the U.S. Fish and Wildlife Service (FWS) which has proposed a rule<sup>8</sup> largely on the basis of the information contained in the Report.

### **APPEAL OF GENERAL STATEMENTS**

As we stated in our original Request, the Report is demonstrably a highly influential scientific assessment<sup>9</sup>, regardless of the statements in the USGS Response that it was not designated as such. The USGS provides a standard for information used in such reports, and the IQA along with the OMB Guidelines and Final Bulletin adopted by the USGS inform that standard by setting the bar for what constitutes the minimum quality for highly influential information and how to obtain it. The USGS failure to comply with its own policies and principles as well as the minimum statutory standard for the quality of information used in the Report constitutes a failure to comply with the most fundamental requirements of the Administrative Procedures Act (APA)<sup>10</sup> and the IQA and must be corrected.

The Report is a sophisticated amalgamation of implication, prevarication, and speculation, with data to support its statements and conclusions glaringly missing. Thus, it fails to reach both the USGS Fundamental Science Practices Policy (Science Practices Policy) and the IQA requirements for the minimum level of information quality required for a highly influential scientific assessment of the invasiveness and ecological impact of large constrictor snakes. The authors have relied on the USGS reputation to shield them from scrutiny. The Report appears to identify 9 species of constrictor snakes which are of such size and/or power to be identified as giant, which are capable of inhabiting large portions of the United States, which are poised to rapidly move into those portion of the United States and immediately consume livestock, small children, destroy power lines and generally terrorize the nation. This is accomplished by:

- Drawing maps of available habitat based on data collected from weather stations where there is no record of the presence of the species whose range is being examined;
- Failure to provide the weather stations or the actual data used in the climate matching model to allow a qualified third party to substantially reproduce the results of this highly influential information;
- Ignoring 40 years of empirical data demonstrating no expansion of 2 small populations of these snakes;
- Mischaracterizing measurements such as 'entry data';
- Avoiding citation of actual data and merely referencing 'extensive documentation in the literature' without ever providing that documentation;
- Misapplying and misinterpreting guidance in government documents; and
- Substituting speculation for data to arrive at conclusions regarding risk of expansion.

As a result of high profile cases and examples, Congress enacted the IQA out of concern for the quality of science that was being presented and used by federal agencies in making important

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<sup>8</sup>75 Fed Reg (Friday, March 12, 2010) 11808-11829

<sup>9</sup>OMB's December 16, 2004, "Final Information Quality Bulletin for Peer Review" Defines highly influential scientific assessment as: "A scientific assessment is considered "highly influential" if the agency or the OIRA Administrator determines that the dissemination could have a potential impact of more than \$500 million in any one year on either the public or private sector or that the dissemination is novel, controversial, or precedent-setting, or has significant interagency interest".

<sup>10</sup> 5 U.S.C. §§ 551-559.

decisions<sup>11</sup>. The IQA Guidelines clearly state that the more influential the decision, the higher the quality of the information required. This Report is being disseminated by the USGS and is referenced as the basis for Congressional legislation and a proposed rule published by the FWS that contemplates banning the trade in these 9 species as 'injurious' under the Lacey Act<sup>12</sup>. As such, the Report becomes a highly influential scientific assessment with attendant requirements for quality under the IQA.

In addition to the IQA, the contents of the Report must comply with the USGS Science Practices Policy. Of particular importance are the following requirements of that policy; each of which is violated multiple times in the Report:

- Interpretations are presented as honestly and straightforwardly as possible, are without apparent bias, and contain no derogatory remarks or adverse criticism.
- The conclusions are based on the **best available data** interpreted with sound scientific reasoning that **avoids speculation**<sup>13</sup>.
- Information products should not recommend or appear to advocate or prescribe a particular public policy or course of action<sup>14</sup>.

This Appeal is being filed under the IQA in an attempt to give the USGS an opportunity to withdraw and correct the Report and thereby disseminate an improved document that complies with the IQA, its Guidelines and longstanding USGS Science Policy.

USARK represents reptile owners, breeders, buyers and hundreds of other related businesses that support reptile owners -- from food suppliers, cage and bedding suppliers, veterinarians, and shippers. USARK and its members are vitally interested in the prudent and constructive regulations of these reptiles but one which has a foundation in science based on data, rather than the opinions of a few vocal career government employees who are abusing their positions of trust by substituting speculation for hypotheses validated by data. If the information in the Report is not corrected members of USARK and the businesses that rely on the reptile trade in these constrictors will face drastic and potentially permanent reductions in their ability to conduct business. Our members and participating businesses are all small businesses. In this economic climate the public cannot afford to destroy an industry based on a report that is not based on any data, but whose basis is purely speculation. USARK members will suffer irreparable harm if the Request remains unresolved. Hence, we are filing this Appeal.

The USGS has disseminated information in the Report and represented that the information is sufficient to make a determination with respect to the requirements of Lacey Act in designating these species as injurious. However, the USGS policy requires that data, not speculation, form the basis of their scientific reports. The Report fails this requirement. The IQA standards require the very highest level of information quality for a highly influential scientific assessment, which this Report constitutes, notwithstanding the USGS failure to identify it as such. Failure to base findings in such an assessment on the best available information (in this case "data", as required by the USGS) is a

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<sup>11</sup> Section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001 (Pub. L. No. 106-554; H.R. 5658).

<sup>12</sup> 75 Fed Reg (Friday, March 12, 2010) 11808-11829

<sup>13</sup> emphasis added

<sup>14</sup> From U.S. Geological Survey Manual 502.4 - Fundamental Science Practices: Review, Approval, and Release of Information Products

failure to comply with the procedural and substantive requirements of the IQA and the USGS Fundamental Science Policy and IQA Guidelines. Thus, the information included in the Report is:

- **Inaccurate**, in that it fails to meet the data standard required by the USGS for its scientific documents;
- **Inaccurate**, in that significant portions of the 'data' used to identify suitable habitat do not exist;
- **Biased**, in that it assumes an outcome and misapplies the invasive species protocol in order to achieve the predetermined outcome;
- **Incomplete**, in that it fails to include material data and analysis that rebuts the assumptions and assertions which underlie the report, and while acknowledging the absence of supporting data, fails to acknowledge the only basis for its conclusions are speculation; and
- **Unclear**, in that it uses a tone and vocabulary regarding the certainty and magnitude of risk from these species that is unsupported by data or tested hypothesis and which is refuted by over 40 years of empirical data.

#### **APPEAL OF SPECIFIC STATEMENTS**

*The detailed discussion is formatted as follows:*

- *First, it presents the text of each of the original request for correction filed by USARK. In these original requests, the text boxes show direct quotes of USGS statements in the Report disseminated by the USGS;*
- *Second, it presents the verbatim responses from the USGS Letter, also in text boxes. These text boxes are preceded by a heading identifying them as USGS Letter Responses; and*
- *Third, it presents our Appeal of the USGS response to the original request for correction.*

#### **Original Correction Request #1**

*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; and*
- 2. by requiring the scope of the review instructions given to peer reviewers to be consistent with that required under the OMB Final Bulletin.*

The USGS must seek an independent peer review of the Constrictor Report as the document is a highly influential scientific assessment. As OMB has observed, 'peer review is one of the important procedures used to ensure that the quality of published information meets the standards of the

scientific and technical community<sup>15</sup>. However, for a peer review to serve its intended purpose, it must be designed and implemented with certain considerations in mind, including the selection of the reviewers and scope of the review.

As a matter of law, all federal agencies - including the USGS - must comply with the Final Bulletin. The Final Bulletin establishes mandatory peer review standards, a transparent process for public disclosure, and opportunities for public input. In selecting its reviewers, the applicable federal agency must consider conflict of interest, independence, expertise, and balance. If peer reviewers are not federal employees, the agency must adopt or adapt the National Academy of Sciences Policy on Committee Composition and Balance and Conflict of Interest (NAS Policy)<sup>16</sup> with respect to evaluating the potential for conflicts. Panel members should not be placed in a situation where others could reasonably question, and perhaps discount or dismiss, the work of the peer review panel simply because of the existence of such conflicting interests.

The OMB Bulletin requires that the agency consider barring participation by scientists with an interest that could be directly affected by the work of the panel. A reviewer should not have a personal stake in the outcome of the review in terms of career advancement, or personal or professional relationships<sup>17</sup>. Further, agencies must make a special effort to examine prospective reviewers' work as an expert witness, consulting arrangements, scientific and technical advisory board memberships, honoraria and sources of grants and contracts.

The Final Bulletin also requires that reviewers be independent and not have participated in the development of the work product<sup>18</sup>. Significant consulting and contractual relationships with the agency sponsoring peer review may raise questions regarding independence. Likewise, when the agency and a researcher work together (e.g., through a cooperative agreement) to design or implement a study, there is less independence from the agency. Additionally, agencies must rotate peer review responsibilities across the available pool of qualified reviewers.

The Final Bulletin provides that "the intensity of peer review should be commensurate with the significance of the information being disseminated and the likely implications for policy decisions"<sup>19</sup>. The Final Bulletin emphasizes "the need for rigorous peer review is greater when the information... presents conclusions that are likely to change prevailing practices, or is likely to affect policy decisions that have a significant impact." Specifically, the language included identifies highly influential scientific assessments as requiring the most rigorous peer review available. The Constrictor Report is controversial, and precedent setting, as well as having significant interagency interest as it is used as the basis for the FWS determination with respect to listing the 9 subject species as 'injurious' under the Lacey Act as well as influencing Congressional legislation. The Constrictor Report presents conclusions, which if accepted, will result in a change in the prevailing practices and affect policy decisions that will affect the entire industry related to the constrictors addressed in the Constrictor Report. The costs resulting from the prohibition of the commerce of countless reptile breeders and owners as a result of baseless assertions and speculation that these

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<sup>15</sup> 70 Fed. Reg. (Jan. 14, 2005) at 2664, 2665

<sup>16</sup> <http://www.nationalacademies.org/colbi-coi/Jorm-D.pdf>

<sup>17</sup> Gary K. Meffe et al, *Independent Scientific Review in Natural Resource Management*, 12 CONSERVATION BIOLOGY 268 (1998).

<sup>18</sup> 70 Fed. Reg. (Jan 14, 2005) at 2675-2676

<sup>19</sup> 70 Fed. Reg. at 2668

species are on the brink of invading vast portions of the United States could have a cumulative impact of \$500 million or more annually.

Additionally, the Final Bulletin directs agencies "to strive to ensure that their peer review practices are characterized by...scientific integrity" which includes "the identification of the scientific issues and clarity of the charge to the panel [and] the quality, focus and depth of the discussion of the issues by the panel..." Further, "the charge should ask that peer reviewers ensure that scientific uncertainties are clearly identified and characterized...; ensure that the potential implications of the uncertainties for the technical conclusions drawn are clear...and that they consider value-of-information analyses that identify whether more research is likely to decrease key uncertainties." The USGS clearly failed in this, as there is no evidence that the reviewers were asked whether there was data to support the speculation included in the Constrictor Report, despite the fact that the USGS Science Practices Policy requires that publications be based on such data.

In a letter to the Senate Committee on Environment and Public Works, 10 research scientists familiar with both publishing in peer-reviewed journals and providing expert reviews of papers, stated that it would be a misrepresentation to call the Constrictor Report "scientific". They point out that the Constrictor Report lacks an external Peer review. They note that only part of the Constrictor Report is fact-driven and that as a result of the authors' methods the Constrictor Report contains information that is unsubstantiated and, in some cases, contradicts sound existing data. They conclude that, as written, the Constrictor Report is not based on best science practices.

A brief examination of the 20 reviewers identified in the Acknowledgments for the Constrictor Report identified that at least six are government biologists (three work for the USGS and six have either co-authored articles on the "dangers" or "problems" of Burmese pythons in the Everglades, or have been featured in popular media making such statements as have both Reed and Rodda). At least 5 are currently working in South Florida on Burmese python management and eradication.

### **USGS Letter 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.

### **APPEAL OF USGS RESPONSE DECISION AND REQUEST FOR REMEDY**

The USGS response asserts that its failure to identify the Report as a highly influential scientific assessment absolves it from compliance with the OMB Peer Review Bulletin. The USGS response

erroneously implies that the Agency is the sole arbiter of whether a scientific assessment is highly influential. In fact, the OMB Peer Review Bulletin states:

*“The term “influential scientific information” means scientific information the agency reasonably can determine will have or does have a clear and substantial impact<sup>20</sup> on important public policies or private sector decisions.”*

This statement requires that USGS can reasonably determine whether there would be a clear and substantial impact on important public policies or private sector decisions. In its response, USGS has simply ignored the direction to determine the consequences of the Report’s contents and asserted with no supporting data that the Report is not highly influential. In addition to the readily apparent and available information on the influential nature of the information in the Report, Agency staff from USGS and others had been actively promoting legislation and regulatory controls related to the species addressed by the Report and based on the contents of the Report. The sheer numbers and commerce value of the constrictors indicate significant economic effects. The Report considers cessation of trade, whether legislative or regulatory, signaling significant public policy as well as private sector decisions. Comments by the Small Business Administration, the Department of Agriculture and the Association of State Fish and Game Agencies questioning the prudence of the regulatory and legislative actions being predicated on contents of the Report demonstrate the influential and controversial nature of the information in the Report. Finally, the FWS in its proposed rule to identify the 9 species examined in the Report identifies the information contained in the Report as substantive and states:

*“Reed and Rodda (2009) provided the primary biological, management, and risk assessment information for this proposed rule.”*

The USGS claim appears to be manufactured purely to avoid the scrutiny that a highly influential scientific assessment requires. It is clear, based on the record, comments, and the activities of USGS and FWS staff that the Agency could have reasonably determined that this Report was a highly influential scientific assessment. Nevertheless, the Agency appears to believe that simply asserting the Report is not a highly influential scientific assessment absolves them from their responsibility to ensure it meets the minimum information quality required by Congress and by its own policies.

The USGS references a ‘peer review’ in their response. That peer review did not meet the requirements of the Bulletin. First, it was not transparent as required by the Bulletin. The reviewers are not disclosed, their relationships to the authors, the USGS, and the requisite independence as required by the Bulletin are not disclosed. In addition, there is no information on the charge to the reviewers or to their responses and the agency’s response to their comments.

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<sup>20</sup> Emphasis added

The OMB Bulletin on Peer Review states<sup>21</sup>:

- *This Bulletin also applies stricter minimum requirements for the peer review of highly influential scientific assessments, which are a subset of influential scientific information. A scientific assessment is an evaluation of a body of scientific or technical knowledge that typically synthesizes multiple factual inputs, data, models, assumptions, and/or applies best professional judgment to bridge uncertainties in the available information.*
- *In general, an agency conducting a peer review of a highly influential scientific assessment must ensure that the peer review process is transparent by making available to the public the written charge to the peer reviewers, the peer reviewers' names, the peer reviewers' report(s), and the agency's response to the peer reviewers' report(s).*
- *In addition, the agency must address reviewers' potential conflicts of interest (including those stemming from ties to regulated businesses and other stakeholders) and independence from the agency.*
- *This Bulletin requires agencies to adopt or adapt the committee selection policies employed by the National Academy of Sciences (NAS) when selecting peer reviewers who are not government employees.*

Therefore, as remedy, we request that the highly influential scientific assessment which is the Report be withdrawn from the public record and a peer review consistent with the requirements of the OMB Peer Review Bulletin be conducted with independent peer reviewers, transparency with respect to the written charge to the peer reviewers, the peer reviewers' names, identification of potential conflicts and the peer reviewers' report(s), and the agency's response to the peer reviewers' report(s).

### **Original Correction Request #2**

*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.*

The Constrictor Report states that the 11 referenced hypotheses are taken from a table in a recently published paper of one of the authors (see Rodda and Tyrrell, 2008) and that only four of the 11 can be applied. No information is supplied to indicate whether these hypotheses were tested and what data was used to test them. Further, no data is provided to support the determinations found in tables 10.1 through 10.4. Nevertheless, the authors proceed to make determinations based on no data whatsoever, and their confidence in the outcome is inexplicably high.

The table outlining what is known about the reproduction of the nine species of great constrictors is notable for the paucity of data. It appears that little is known about most of the species and nothing is known about the Beni Anaconda or the DeSchaunsee's Anaconda, as they have not been in captivity

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<sup>21</sup> Emphasis added

in decades. The other species have shown little capacity for extended sperm storage. Inter-clutch interval is a year or longer in all the seven species that have been bred in captivity.

The tables illustrating the results of all the risk analyses show likelihood of establishment as high, medium, or low. No species has a risk rated as "Low" --- about half are high and half are medium in each of the tables. To state that a Green Anaconda has roughly the same high probability to establish as, say, a small anoline lizard without any supporting data is clear evidence of bias and of the overall unrealistic assumptions and conclusions made in the Constrictor Report. Further, there is no evidence that data was used to create an assessment of the probability of establishment across the full range of climate maps. It would be reasonable for it to vary from North to South and East to West but this appears to have been ignored.

We request the USGS provide the required transparency with respect to providing sufficient data and information on methods used to allow a qualified third party to substantially reproduce the results shown in Tables 10.1 through 10.3 as well as the high and moderate risk determinations and the certainty level associated with those determinations shown in Table 10.4.

#### **USGS Letter 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.

#### **APPEAL OF USGS RESPONSE DECISION AND REQUEST FOR REMEDY**

The USGS response to the request for correction is inadequate, evasive, and fails to provide the transparency request in the Request and required by the IQA, the ANSTF Guidelines and the USGS Science policies.

*The ANSTF guidelines are merely a framework for the preparation of a risk assessment and in and of themselves contain no analytical tools, data or information*

The ANSTF Guidance contains no data no analytic methods and provides no support for the contents of the Report. The Guidance is merely a process document. Using the process identified in the ANSTF Guidance the USGS must also conform to existing law, guidance and policy. In this case, the IQA and the various USGS Science policies should have been but were not applied. The USGS statement that the ANSTF Guidelines were cited extensively, offers no support for the absence of supporting data in the report or the transparency of the report's contents.

**The Report fails to follow the cited ANSTF Guidelines as follows:**

The ANSTF Guidelines state:

- *“The Review Process provides a framework where scientific, technical, and other relevant information can be organized into a format that is understandable and useful to managers and decision makers.”*; The Report fails to include data to support the bulk of its statements and instead relies on speculation, in violation of USGS Science Practices Policy. It is not possible to understand how the tables were developed, nor how the climate maps were calculated upon which the tables rely.
- *“The Review process was developed to function as an open process with early and continuous input from all identified interested parties.”*; The USGS process was not open although it occurred over a period of years, commencing with the initial publication of the Reed and Rodda Climate Report<sup>22</sup>. The Climate Report, published several years ago was subject to substantial criticism, was the subject of a request for correction of information, and most recently has been demonstrated to have been based on data that could not be substantiated<sup>23</sup> which is a violation of the Federal Research Misconduct Policy. Multiple, significant comments made in public hearings, through the Information Quality Act correction process, through unsolicited comments made to USGS were ignored. The USGS has clearly failed to follow the Guidance in the ANSTF document cited in any manner that would support the contents of the Report.
- *“Risk assessments should concentrate on demonstrated risk.”*; As was pointed out in our original request for correction, the majority of the statements in the Report were in fact speculation as no data was available on the species or to substantiate the speculation. This is inconsistent with the guidance and with the USGS Fundamental Science Policy that requires use of data, not speculation in scientific reports. . Further, in the authors state: “The basic natural history of the giant constrictors is largely unknown; our risk assessment reflects this uncertainty.”<sup>24</sup> How do the authors reconcile this statement with their findings all of which show significant risk, but none of which have any data to substantiate the risk assessment?

*No data is included in the Report nor is any literature is cited to support the tables.*

No data is provided to support the ‘synthesis’ included in the chapters referenced in the report. None of the cited references in either the chapter referenced by USGS in their response to our request for correction contain sufficient information to substantially reproduce the contents of the Tables in Chapter 10.

The literature<sup>25</sup> provides data demonstrating that many of the identified weather stations used in the climate-matching model were outside the range of the species and identifies other general and specific errors. The errors are detailed in Appendix C. The published literature demonstrates a calculated and directed series of what appear to be inaccurate, biased, incomplete, and unclear

<sup>22</sup> Burmese Python Climate, Rodda, et al, 2009

<sup>23</sup> Michael Robert Cota Comments Appendix C

<sup>24</sup> Page 3 of the Report

<sup>25</sup> Barker and Barker (2010)

information relied upon or included in the Report. If the climate and range findings which form the only factual basis for the Report's risk analysis are true the IQA requires sufficient transparency about methods and data to substantially reproduce those findings and demonstrate the scientific integrity of the Report. If the findings in Barker and Barker (2010) are accurate, at a minimum, poor scientific judgment was used in selecting the weather stations used in developing their climate models. A detailed and specific review of the errors is attached.<sup>26</sup>

We attempted to reproduce the results shown in the tables in chapter 10 and were unable to even reach the most rudimentary conclusions due to a lack of data to support the conclusions.

### *The Report Fails to Meet the ANSTF Guidelines for Transparency*

In addition to the transparency requirements of the IQA Guidelines the ANSTF Guidelines, which the USGS relies upon in its response, make the following statements with regard to transparency:

- Adequate documentation of the information sources makes the Review Process transparent to reviewers and helps to identify information gaps.
- This transparency facilitates discussion if scientific or technical disagreement on an element-rating occurs. For example, if a reviewer disagrees with the rating that the assessor assigns an element the reviewer can point to the information used in determining that specific element-rating and show what information is missing, misleading, or in need of further explanation.

Based on our perusal of the documentation contained within the report, there is insufficient transparency for a qualified member of the public to substantially reproduce the tables identified in our original request. Notwithstanding their assertion in the response provided to USARK, the USGS has not complied with the requirements of the ANSTF Guidelines in this regard.

Following is a prose recitation of the limitations of each of the tables used to support the risk analysis. A more quantitative approach to this was impossible because of the lack of transparency regarding data and methods used to arrive at the contents of each of the tables.

#### **Table 10.1**

Of the 11 traits identified in the table and hypothesized to contribute to the survival of non-native species, less than a third are supported by data. The only attributes for which data exists are longevity, broad diet, and absence of parasites. The remaining attributes are either unknown, don't exist, or in the case of climate match are based on erroneous data and interpretation.

#### **Table 10.2**

Of the 8 traits identified in the table and hypothesized to contribute to the reproduction of non-native species, only a quarter are supported by any data in the literature.

#### **Table 10.3**

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<sup>26</sup> See Appendix C

Of the 11 traits identified in the table and hypothesized to influence the spread of non-native species, less than 20% are supported by any data. The remainders are unknown, do not exist, or as in the case of the range assertions, are based on erroneous data and interpretation.

#### **Table 10.4**

While Tables 10.1 through 10.3 identify hypothesized attributes for the 9 species, less than 30% of the necessary attributes for successful colonization and spread exist based on the Tables' contents. Nevertheless, Table 10.4 finds that colonization potential is 'High' for all 9 species and that the potential for spreading is 'High' or 'Reasonably Certain to Occur'.

No explanation is provided to explain how colonization potential is 'High' and very certain to occur when:

- Less than 30% of the attributes hypothesized as positively influencing survival are present;
- Less than 25% of the attributes hypothesized as positively influencing for reproduction are present;
- Less than 20% of the attributes hypothesized as positively influencing spread are present.

No data is presented to support any of the hypothesized attributes. No analysis is presented to support the assertion that there is any validity to the hypothesized attributes' importance.

#### **Table 10.5**

This table asserts the existence of economic, environmental and perceived impacts of the 9 constrictors' establishment. However, no data is presented to support the findings included in the table. The USGS appears to believe that conclusive statements by the authors contained in the report and vague references to 'well known' facts is a suitable substitute for specific collected and cited data which is available for review.

As remedy we request the USGS either provide sufficient data and information on methods used to allow a qualified third part to substantially reproduce the results shown in Tables 10.1 through 10.5 or remove the tables as they are inconsistent with the requirements of the IQA and the USGS Science Practices Policy.

#### **Original Correction Request #3**

*Request that the Constrictor Report be corrected to:*

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

- *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;*
- *Include data where available, that demonstrate species do not survive in areas in the United States which the model identifies as suitable for habitation; and*
- *Remove all statements that pythons and boas hibernate, or provide data that supports the statements.*

Published Peer Reviewed Scientific Model

The Constrictor Report fails to acknowledge the findings of Pyron et. al. 2008, a peer reviewed, published study that directly contradicts the Constrictor Report's findings regarding the potential for expansion of the subject snake species<sup>27</sup>. The Constrictor Report mentions Pyron et al on page 19 and the authors state their belief that the model under-predicts areas of the United States that can be invaded by Python molurus. However, the study never rebuts the results of the work. This is the only place in the Constrictor Report where this paper is mentioned. While the OMB Guidelines state that the adequacy of the result of published and peer reviewed work is a rebuttable presumption; the Constrictor Report fails to rebut the findings in Pyron and inadequately explains the basis of the decision to use its modeling approach over that used by Pyron et al. Instead, while acknowledging that multiple factors influence the distribution of an animal, the Constrictor Report relies on only a single factor, climate, to predict the invasiveness of the large constrictors. In addition, the Constrictor Report spends an inordinate amount of time discussing all the possible failings of the ecological niche model that is the basis for the Pyron conclusions without demonstrating that these failings actually exist in the published paper.

The Constrictor Report is **inaccurate** and **biased** in that it ignores superior data and analysis, and instead sensationalizes the real problem of the established population of non-native snakes in southern Florida. The Constrictor Report speculatively expands the threat existing from *Python molurus* in the relatively remote and sparsely populated Everglades in South Florida into the backyards of a significant proportion of the southern to central United States. This is accomplished by limiting the Constrictor Report's habitat suitability model variables to mean monthly temperature and mean monthly precipitation. The model the Constrictor Report relies upon does not include many variables known to influence species distribution, including climatic extremes, vegetative assemblages, predator and prey abundance, impacts or highways, impacts due to agriculture, and impacts due to urbanization. This deliberately naïve approach results in a gross overestimate of potential habitat for these snake species.

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<sup>27</sup> Pyron RA, Burbrink FT, Guither TJ (2008) Claims of Potential Expansion throughout the U.S. by Invasive Python Species Are Contradicted by Ecological Niche Models. PLoS ONE 3(8): e2931. doi:10.1371/journal.pone.0002931

While the model developed by Pyron and colleagues is not perfect, it does use a greater complexity of environmental characteristics. As a result, the model more accurately predicts the actual incidence of feral populations of these snakes. The Pyron model limits the suitable habitat for the Burmese python within the continental United States to the extreme tip of Texas and southern Florida. Noteworthy, despite its extremely limited prediction of suitable habitat, the model does include the Everglades, the lone location of an established population in the United States.

#### *Data Contradicts Model Results*

Pythons are kept as pets throughout the United States, yet the only known feral breeding population in the United States is in the Everglades. The Constrictor Reports states that "all of the species under consideration can probably move large distances in short time periods when so inclined." But the Report provides no explanation for the failure of already established populations to expand. This failure to expand suggests that factors beyond those considered in the USGS model are critical to limiting the suitability of habitat for pythons. The Constrictor Report is **biased, incomplete and inaccurate** as it fails to acknowledge this existing data and instead substitutes hypothetical model outputs and speculation.

The USGS Constrictor Report predicts clearly unsuitable habitats to be suitable habitat for both Burmese pythons and boa constrictors. For example, the oversimplified USGS model predicts portions of the deserts of the American Southwest are suitable habitat for both Burmese pythons and boa constrictors. While snakes are quite adept at going long periods without eating, the large size of the subject snakes requires a reasonable presence of suitable medium and large prey species. Such prey resources do not exist in challenging environments such as the deserts of the American Southwest (most native desert snakes species are typically well under one meter). Nevertheless, the Constrictor Report asserts that portions of these deserts are suitable habitat for both Burmese pythons and boa constrictors. The assertion also ignores the fact that Boa constrictors are native to Mexico but their northern distribution abruptly ends where the tropical deciduous forest and tropical thorn scrub give way to Sonoran Desert, providing evidence of a weather or geographic barrier that commences with the desert. Nevertheless, the Constrictor Report asserts the validity of its predictions despite clear evidence that boa constrictors do not tolerate southwestern deserts. The Constrictor Report's suitability map for this species inaccurately includes wide expanses of Chihuahuan Desert and Upland Arizona habitat within the Sonoran Desert.

Another example of the inadequacies of the model supporting the Constrictor Report is that it predicts extreme South Texas to be suitable climate and habitat. While this is plausible in theory and based solely on climate, review of the environmental conditions quickly demonstrate its improbability. There are major differences between South Florida, where only one of the 9 species has become established, and the Rio Grande Valley in the southernmost tip of Texas. First, there are no extensive wild areas similar to the Everglades National Park that serves as a 1.5- million acre, swampy refugium. More than 95% of the original Tamaulipan thorn scrub habitat found in this part

of Texas is gone. It has been replaced with fields of onions, carrots and other produce such as sugar cane. The sugar cane fields are surrounded and burned from all sides simultaneously either annually or biannually, killing all wildlife hidden in the thick vegetation. There is heavy traffic on most roads day and night, and mechanized agriculture would affect the snake's survival ability. Boa Constrictors naturally occur in Tamaulipas, Mexico, 120 miles from the southern tip of Texas, but show no evidence of extending their range northward. There is no data or empirical evidence to support a conclusion that these snakes are likely to expand into southern Texas, rather much information and data demonstrates they have not.

We request that the USGS correct the **inaccurate, incomplete, and biased** information provided in the report that asserts the subject snakes can expand into these habitats, by including complete information regarding the environmental needs of the species beyond that of climate.

#### *Python Cold Tolerance*

The Constrictor Report further is **biased, incomplete and inaccurate** in that it ignores documented sensitivity to cold in predicting suitable habitats. The Constrictor Report states that the Burmese python is exceptional among the giant snakes in its ability to tolerate cold weather. The relative nature of this statement has been demonstrated by the recent cold weather event that hit the southeastern United States. While the cold was atypical it was not unheard of for the region, and its impact on Burmese pythons is worthy of mention. After the cold weather event, about 50% of the pythons found in southern Florida were dead and 5 OF 9 pythons housed in outdoor enclosure with heating pads provided at a research facility in northern Florida died, 2 became ill and were brought inside, and 2 survived using provided heating pads. The sensitivity of the species to this extreme weather event in Florida questions the likelihood of persistent python populations in areas of the United States included in the Constrictor Report as suitable habitat where such weather events are much more frequent and much more extreme. Again, real data is available but hypothetical speculation is used.

The USGS received information that pythons and tropical boas do not appear to make the distinction between fatally cold and uncomfortably cold. Pythons are descended from tropical populations of animals where freezing weather is unknown. The ability to shelter from fatally cold temperatures is unnecessary in their native ranges where fatal cold extremes are unknown.

#### *Transparency of Data and Methods*

The USGS model grossly overestimates the potential habitat for these snake species. No introduced reptile maintains such a wide distribution in the United States, with the most widely distributed species being the Mediterranean gecko, a species that mostly inhabits human dwellings rather than the natural habitat across its distribution. People throughout the United States have kept the snake species, which are the subject of the Constrictor Report, as pets for decades. Yet the only known feral breeding populations in the United States are in the Everglades. Such a wide distribution of

potential sources of invasion, but only a localized invasive event, leads one to the conclusion that factors beyond those used in the USGS model are critical to limiting the suitability of habitat for pythons.

The USGS, instead of using an available, published, peer reviewed model, used a simple climate based model as the basis of the Constrictor Report. Our review indicates that the map forming the basis for all USGS's climate-space estimates of these pythons is incorrect. The depiction of the distribution is simplistic and overestimates the presence of these species at high elevations -- across the northern limit of the species from Nepal to Fujian, China.

We request that all records with monthly mean temperatures of 10 degrees or less be removed from the data set, unless the locality is exactly matched to an actual published locality and similar elevation for a python. There is no data supporting an assertion that pythons can survive mean temperatures of 10 degrees C. The data forming the basis of all the analyses includes localities of the weather reporting stations that are at excessively high elevations. There is no data that supports any assertion that these species are commonly present at elevations exceeding 1000m. However, in the report, 12% of the reporting weather stations are located at elevations that exceed 1000m and several exceed 2000 m. We request that all records exceeding 1000m be removed from the data set, unless locality is exactly matched to an actual published locality with a similar elevation for a python.

The model assumes that these snakes hibernate. In comparing the climate-space data derived from the weather-reporting stations reports to USA climate data, the authors performed two separate climate-matches; one climate-match assumes a 3-month period of hibernation (Clim3) and the second assumes a four-month period of hibernation (Clim4). This assumption appears to be based on one report from 1912, and is otherwise unsubstantiated.

Of the 43 records for weather stations in China, 25 records are located outside of the natural distribution of Burmese pythons, due either to erroneous assumptions made for the geographic distribution or unfounded assumptions about the elevational distribution of the species in China. This amounts to more than 25% of the total records for Burmese pythons on which the report is based as being erroneous.

The Constrictor Report, states that, when possible, the localities of the weather stations used in all analyses are matched closely to the exact localities of the pythons. In fact, the data set incorporates only four records based on actual topographic locations of python specimens out of a total of 149 records. The remaining 145 records are apparently chosen at random around the periphery of the distribution of the two species. In some cases the weather stations are near the published general locations of pythons specimens, this is not so for the majority of the records. For this reason alone—the near complete absence of actual locality records of the species being studied—it is not possible

to rely on any of the estimates, analyses, and predictions based on this data without more detail as to methods and data.

The exact means by which the climate space generated for each species in the report was matched to the climate of the USA is **not transparent**. The methods are not described in detail, nor are any data for the USA localities included in the Report or otherwise made available. The IQA requires sufficient transparency as to data and methods to allow a qualified third party to substantially reproduce the result.

The methods and data used to produce the results of climate matching, which forms the basis of the report, are **not transparent**. The information provided is **not sufficient to allow substantial reproduction of the results by a third party**. The information that is available supports a conclusion that **significant errors** are embedded in the analysis and that the results are **neither reliable nor reproducible**.

We request that the report be corrected to provide sufficient **transparency** to allow a qualified third party to substantially reproduce the results in the Constrictor Report.

#### **USGS Letter 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.

#### **APPEAL OF USGS RESPONSE DECISION AND REQUEST FOR REMEDY**

The response ignores the point of the request.

We requested that USGS provide the basis for using an unpublished and unreviewed climate matching model rather than peer reviewed scientific literature. No basis has been provided for failure to use published models and the USGS has not rebutted the contents of the published models. Further, the USGS has not provided sufficient transparency with respect to the data, methods or analysis underlying the climate-matching model to allow a qualified member of the public to substantially reproduce the results. **The USGS has not responded to the request.**

We were able to access the actual data used in the Report<sup>28</sup> and found a series of significant compounding errors. ALL of the errors identified served to increase the range of the species examined in the Report. See Appendix C for a recitation of the data errors included in the climate matching exercise.

Although requested to do so, and provided with supporting information, the USGS refused to acknowledge and apply the findings of the studies and empirical information, which indicate that Burmese pythons are less cold tolerant than the Constrictor Report assumes. The Report identifies areas of the United States that have cold conditions that are inimical to Burmese Pythons as available for colonization and expansion. When the data is provided demonstrating such assumptions were patently invalid, the USGS disingenuously asserted that they merely “attempted to bracket the climatic conditions of the active period”, and that they did not “make any assertions regarding weather or cold tolerance of Burmese pythons.”

While the Report may not have explicitly made assertions regarding the tolerance of Burmese Pythons specifically, it does contain the following statement, “This document addresses primarily the biological impacts associated with potential colonization of the United States by any of the nine giant constrictors, and it tabulates the biological information germane to potential economic and social impacts.”

The Report’s risk assessments tabulated in Tables 10.1-10.7 rely on colonization and expansion assessments that flow from the climatic model that is only accurate if cold tolerance is exaggerated. Failure to include this highly influential information makes the Report **biased, incomplete and inaccurate** from the perspective of the IQA Guidelines.

The USGS simply ignores the request to correct the Report to include data demonstrating areas of the United States identified by the model as suitable for habitation are not in fact suitable for habitation.

The USGS simply ignores the request to correct the Report to remove all statements that pythons and boas hibernate, or provide data that supports the statements. Such statements, which are not supported by data even if identified as hypothesis constitute opinion or speculation and are inconsistent with the requirements of the USGS Fundamental Science Policy when they form the basis of conclusions in the Report as they are not based on data. The response states:

*“The report does not specifically address cold tolerance of individual Burmese pythons, as the only values used in climate matching are the mean monthly*

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<sup>28</sup> The data was accessed by submitting a FOIA request to the USGS. However, while the data is now available, there is no information on how exactly it was synthesized into the Tables found in Chapter 10. Given the extremely poor quality of the research integrity demonstrated in the climate matching and data for the Report, we are particularly eager to review the process whereby these tables were generated.

*ambient temperatures for the active period of occupied areas, under two hypotheses of hibernation duration."*

The entire premise of the Report is a risk analysis based on the climate study which purports to demonstrate the widespread threat throughout the United States from these 9 species based on theoretical climate matches. By doing so, the report addresses climate needs of the subject species as a whole and accordingly asserts that, in general, individual snakes would colonize and expand in these environments based on nothing more than climate.

There is no data to support the assertion any of these 9 snakes hibernate as a biological norm. Assuming hibernation or adaptive behavior to cold, in the absence of any hypothesis testing or data to support the supposition, the USGS enters into the realm of fantasy. The assertion that simply because some snakes found refugia and survived lethal temperatures an entire population would do so, contains two logical fallacies. First, the assertion assumes that the snakes deliberately sought out and found refugia when in fact it was a matter of fortuitous circumstance rather than adaptive behavior and second, it assumes that those animals that survived are genetically superior, when in fact survival was either a fortuitous coincidence for the snake, or the result of human intervention.

The USGS has failed to provide any transparency with respect to the climate matching exercise undertaken in the United States. No information on data or methods is provided which would allow a qualified member of the public to substantially reproduce the results of the climate matching in the United States.

Further, the USGS response appears to assume that they have no responsibility for correcting information that they are disseminating if that information is subsequently demonstrated to be inconsistent. We draw the attention of the USGS to the preamble of the OMB IQA Guidelines, which the USGS adopted in their entirety. The OMB states:

*"Dissemination" is defined to mean "agency initiated or sponsored distribution of information to the public." As used in paragraph V.8, "agency INITIATED \* \* \* distribution of information to the public" refers to information that the agency disseminates, e.g., a risk assessment prepared by the agency to inform the agency's formulation of possible regulatory or other action."*

The OMB also clarifies the **ongoing** responsibility of disseminating agencies to ensure the quality of the information they disseminate. We reproduce the entire explanation with our emphasis to provide context for our assertions:

*"We also want to build on a general observation that we made in our final guidelines published in September 2001. In those guidelines we stated: "... in those situations involving influential scientific, [financial,] or statistical information, the substantial reproducibility standard is added as a quality standard above and beyond some peer review quality standards" (66 FR 49722*

*(September 28, 2001)). A hypothetical example may serve to illustrate this point. Assume that two Federal agencies initiated or sponsored the dissemination of five scientific studies after October 1, 2002 (see paragraph III.4) that were, before dissemination, subjected to formal, independent, external peer review, i.e., that met the presumptive standard for "objectivity" under paragraph V.3.b.i. Further assume, at the time of dissemination, that neither agency reasonably expected that the dissemination of any of these studies would have "a clear and substantial impact" on important public policies, i.e., that these studies were not considered "influential" under paragraph V.9, and thus not subject to the reproducibility standards in paragraphs V.3.b.ii.A or B. Then assume, two years later, in 2005, that one of the agencies decides to issue an important and far-reaching regulation based clearly and substantially on the agency's evaluation of the analytic results set forth in these five studies and that such agency reliance on these five studies as published in the agency's notice of proposed rulemaking would constitute dissemination of these five studies. These guidelines would require the rulemaking agency, prior to publishing the notice of proposed rulemaking, to evaluate these five studies to determine if the analytic results stated therein would meet the "capable of being substantially reproduced" standards in paragraph V.3.b.ii.B and, if necessary, related standards governing original and supporting data in paragraph V.3.b.ii.A. If the agency were to decide that any of the five studies would not meet the reproducibility standard, the agency may still rely on them but only if they satisfy the transparency standard and-as applicable-the disclosure of robustness checks required by these guidelines. Otherwise, the agency should not disseminate any of the studies that did not meet the applicable standards in the guidelines at the time it publishes the notice of proposed rulemaking."*

While the example in the Guidelines speaks to the rulemaking agency, the Guidelines apply equally to any agency disseminating this highly influential scientific assessment. The USGS received peer reviewed and published work that demonstrated clear error in the original Rodda et. al. 2008 work, as well as Barker and Barker 2010. In addition, our request for correction as well as the original request for correction submitted with respect to the Rodda 2008 work identified the same substantial errors. The original comments and requests for correction identified the lack of data to support the statements and assumptions in the two USGS papers regarding these species tolerance and response to cold temperatures. The most recent papers provide data that substantiate the empirical observations<sup>29</sup> that these snakes are not adapted to the cold and cannot adapt sufficiently quickly to avoid mortality.

As remedy, we request that the USGS provide data to support their assumptions related to the cold tolerance of the species in question or correct the report to remove conclusions based on those unsupported assumptions.

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<sup>29</sup> The empirical observations and data have been repeatedly supplied to the USGS prior to publication of the Report.

#### Original Correction Request #4

*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 USGS has built a reputation for scientific excellence. This is in part due to the rigorous standards included in their Science Practices Policy that requires that USGS reports will be based on data. The semantic sleight of hand practiced by the authors of the Constrictor Report relies on the USGS reputation while in fact disseminating information that fails to comply with the requirements of the IQA and the USGS Information Quality policies.

Throughout the Constrictor Report statements are made without supporting data either in the Constrictor Report itself or in citations. There is an inordinate use of qualifying terms necessary to rationalize the Constrictor Report's speculative comments. More than one out of every hundred words in the manuscript is a word that allows unsupported statements to be included without requiring a disclaimer.

Following is a compilation of selected specific examples of bias in the Constrictor Report. This list is not complete, but is designed to highlight some of the more egregious examples. Such bias does not comply with the requirements of the IQA as well as USGS 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)*

This statement is clearly biased. No information is provided as to how much of the commercial trade passes through South Florida, nor how those numbers have changed over time. Further, the security of the transportation method used is more indicative of the risk of escape. If the South Florida commercial reptile trade has a higher than normal incidence of escape, that data should be provided to support a finding that there is some elevated risk. Otherwise, the statement is merely pejorative and demonstrates an unfounded bias.

It is more likely that South Florida has the only suitable conditions in the United States for any of the nine species considered in this Constrictor Report. The climate of South Florida is the only subtropical zone in the continental United States. More importantly, the 1.5-million acres of the Everglades National Park provide a unique swampy refugium and no other place in the United States is even remotely similar. Established exotic constrictor populations exist in Florida but there is no data that supports the assertion that that this will expand beyond Florida.

Such bias and advocacy are not consistent with the requirements of the IQA or USGS Policy. Therefore we request correction.

- *"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)"*

The statement is clearly **biased** in that it implies many portions of the United States are in danger of colonization by at least one of the giant constrictors. There is no evidence to support this assessment. In fact, the cold spell of January 2010 and resulting mortality demonstrates that these snakes have little chance to survive in colder climates.

- *"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)*

This statement is **biased, speculative, inaccurate, incomplete,** and misleading. There is no information supporting the statement that any one of these snakes have sufficient mobility in terms of time and space to migrate any substantial distance. There is documentation that Burmese pythons can migrate several miles to return to a preferred location. However, there is no information, citations, studies or empirical data supporting a conclusion that any of the 9 species examined are capable of migrating vast distances across inhospitable terrain to colonize the entire United States, or even the selected portions of the United States identified by the Constrictor Report's grossly exaggerated definition of available habitat. In the 30 or so years that boas and Burmese pythons have resided in South Florida, there has been no "spread of their colonies". The Report states, "all of the species under consideration can probably move large distances in short time periods when so inclined."

However, the Report contains no explanation as to why *Python molurus* failed to expand to reach areas north of the Everglades system since first being found there in 1996. The Report also fails to explain the boa constrictor's failure to expand. This species has had only a very localized sustained breeding population since first identified in the 1970s. Clear sources of potential invasion, but no expansion, provide evidence that the factors used in the USGS model fail to capture essential characteristics of suitable habitat for these snakes.

We request the USGS correct the Constrictor Report to remove speculative statements regarding the ability to migrate to other parts of the country, and replace the **speculative** statements with statements which are supported by data. This is consistent with the requirements of the IQA and the USGS Science Practices Policy. We request the USGS to correct the Constrictor Report to remove **incomplete and inaccurate** information, referring to the ability for these snakes to move large distances over short periods of time, and replace the statement with specific information supported by data.

- *"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 Tree snake in Guam and the Habu in the Ryukyu Islands. . . "(page 9; paragraph 3)*

The Constrictor Report admits there is absolutely no applicable knowledge regarding their management and little regarding their biology. Yet the Constrictor Report goes on to inaccurately apply unsuccessful management methods associated with two vastly different and unrelated snake species. No explanation based on similarities or data was made to justify this use of two surrogate species. Accordingly, we request that the Constrictor Report be corrected to provide complete information regarding the differences between the surrogate and the 9 species addressed by the Constrictor Report and include biological information that justifies the use of these snakes as surrogates for the nine large constrictors covered by the Constrictor Report.

- *"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)

The authors reference the devastation wrought on the native bird populations in Guam as snakes were introduced to an island that formerly had no snakes. This statement is clearly biased in that it implies such devastation should be expected as a result of any or all of the 9 snakes, which are the subject of the Constrictor Report, become established anywhere in the continental United States and particularly in the Everglades system.

The Constrictor Report fails to disclose or acknowledge that, unlike Guam, there are no bird species in the Everglades that are naive to snake predation. Further, it fails to note that no such devastation has occurred in the 15 years Burmese pythons have been established and the roughly 40 years that boa constrictors have been established. The statement is biased, incomplete and inaccurate and we request its correction.

#### **USGS Letter Response**

Correction Request #4: 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.

## APPEAL OF USGS RESPONSE DECISION AND REQUEST FOR REMEDY

Had the USGS authors intended to note that Florida is an important part of the reptile trade, they should have made such a statement and supported that statement with data. That was not done. The Report states that much of the commercial trade in these snakes passes through southern Florida without providing data to substantiate the claim. Further, they imply that there is no coincidence that Burmese Pythons, Northern African Pythons, and Boa Constrictors occur in south Florida once again implying, without providing any evidence that the existence of a disproportionate amount of the reptile trade in these snakes occurs in south Florida. Without data to substantiate the implications and statements, the contents of the report are biased, speculative and inaccurate. Accordingly, while the USGS may not perceive the statement as inconsistent with the requirements of the IQA, we have identified specifically where the statement fails to meet the requirements of both the IQA and the USGS own policies and therefore request correction as a remedy.

### USGS Letter Response

*"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.

## APPEAL OF USGS RESPONSE DECISION AND REQUEST FOR REMEDY

Once again, the USGS disingenuously disavows the intent and content of the Report. However the FWS, relying primarily on the contents of the USGS Report<sup>30</sup>, makes the following statement with respect to the need for the proposed rule regarding the 9 snakes addressed by the Report:

*"For a few species, large areas of the continental United States appear to have suitable climatic conditions. There is a high probability that large constrictors would establish populations in the wild within their respective thermal and precipitation limits due to common life history traits that make them successful invaders, such as being habitat generalists that are tolerant of urbanization and capable of feeding on a*

<sup>30</sup> The FWS proposed rule to listing the 9 Species which were the subject of the USGS Report as injurious under the Lacey Act states: "*Reed and Rodda (2009) provided the primary biological, management, and risk assessment information for this proposed rule.*"

*wide range of size-appropriate vertebrates (reptiles, mammals, birds, amphibians, and fish; Reed and Rodda 2009)".<sup>31</sup>*

The statement in the FWS proposed rule relies on the maps in the Report based on the 'climatic matching'<sup>32</sup>, and the contents of the charts in Chapter 10 identifying medium and high risk with respect to survival<sup>33</sup>, range<sup>34</sup>, spread potential and probability of establishment.<sup>35</sup> Accordingly, we request as remedy that the USGS correct the Report so as to render it consistent with the transparency and data requirements of the IQA and the USGS Fundamental Science Policy.

### **USGS Letter Response**

*"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.

### **APPEAL OF USGS RESPONSE DECISION AND REQUEST FOR REMEDY**

The Report does not state that the widespread occurrence of these snakes across the nation would facilitate their spread due to release or escape. The Report states that the 9 species can, '*...probably move large distances over short periods when so inclined*'. Clearly the Report is stating that the

<sup>31</sup> *Federal Register* /Vol. 75, No. 48 / Friday, March 12, 2010 / 11809; emphasis added

<sup>32</sup> Which is discredited in other parts of this document

<sup>33</sup> Table 10.1

<sup>34</sup> Table 10.3

<sup>35</sup> Table 10.4.

species will spread quickly and independently if allowed into the ecosystem. It is interesting to note that despite over half a million snakes entering the United States between 2004 and 2009 and many more bred and sold within the country how few have established populations throughout the United States.

The USGS is clearly participating in rank speculation, inaccurate statements, and bias and we request that this statement be removed. As remedy, we request the USGS correct the Report to either substantiate the claim that large numbers are escaping or being released and/or that they are moving large distances and establishing new populations from existing populations. These snakes have been imported and bred for decades. If this is occurring, there will be data to substantiate the claim.

**USGS Letter Response**

*"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 Tree snake 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.

**APPEAL OF USGS RESPONSE DECISION AND REQUEST FOR REMEDY**

While the use of surrogate species may be common practice, the literature is replete with research that it typically fails to provide any useful information<sup>36</sup>. In the case of the brown tree snake, the differences in ecosystem as well as biology are significantly different. Effective use of a surrogate has as its predicate particularly important similarities. The Report fails to provide any basis for use of the brown tree snake as a surrogate other than the fact it is a snake and invasive.

Further, while the use of surrogates is a common practice, the application of a surrogate presumes a certain level of comparability in terms of life cycle, ecosystem needs and other important biological indicators. For example, one would not expect to see a biologist compare the needs of a house wren with that of an albatross. Yet, this is precisely the exercise the Report engages in when comparisons are made between the Brown Tree Snake and the Habu. Below is an abbreviated comparison for illustration. Details can be found in Appendix B.

Species	Brown Tree Snake	Habu	9 Constrictors
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<sup>36</sup> On the Use of Surrogate Species in Conservation Biology, Caro, O'Douherty; Conservation Biology, Pages 805-814, Volume 13, No. 4, August 1999  
 Use of Abundance of One Species as a Surrogate for Abundance of Others Samuel A. Cushman, Kevin S. Mckelvey, Barry R. Noon, And Kevin Mcgarigal, Conservation Biology, Journal compilation C \_ 2010 Society for Conservation Biology. No claim to original US government works. DOI: 10.1111/j.1523-1739.2009.01396.x

<b>Superfamily</b>	Caenophidia	Caenophidia	Henophidia
<b>Family</b>	Crotalidae	Colubridae	Pythonidae/ Boidae
<b>Environment</b>	Arboreal	Arboreal	Terrestrial/aquatic
<b>Avoids humans</b>	No	No	Yes
<b>venomous</b>	Yes	Yes	No

As remedy, we request that the statements using the Brown Tree snake and the Habu be removed as there is no behavioral, biological or ecological basis for their use as surrogates the 9 constrictors identified in the Report.

### USGS Letter Response

*"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 Tree snake. 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.

### APPEAL OF USGS RESPONSE DECISION AND REQUEST FOR REMEDY

While the authors assert that such implication is not apparent, the FWS clearly understood the statement in such a manner. We quote from the proposed rule:

*"As compared to many other vertebrates, large constrictors pose a relatively high risk for being injurious. They are highly adaptable to new environments and opportunistic in expanding their geographic range. Furthermore, since they are a novel, top predator, they can threaten the stability of native ecosystems by altering the ecosystem's form, function, and structure."*

This statement is repeated in the conclusion section of the reviews of each of the 9 species addressed by the Report. The FWS states that:

*"Reed and Rodda (2009) provided the primary biological, management, and risk information for this proposed rule."*

Notwithstanding the disingenuous 'who me?' attitude of the USGS, in their response; as remedy we request that the inflammatory and ultimately inaccurate and biased statements with respect to similarities implied or explicit between the Brown Tree snake and the Habu be removed, substantiated,<sup>37</sup> or that the USGS explicitly comment to the FWS that their report does not support the conclusions arrived at in the proposed rule by the FWS.

### USGS Letter Response

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

### APPEAL OF USGS RESPONSE DECISION AND REQUEST FOR REMEDY

We noted in our request for correction that there were other numerous unsupported statements and that we would be happy to provide them. It is clear that the authors of the Report believe that it is perfectly acceptable to make speculative statements and treat them as accurate and factual, so it is not surprising they were unable to identify any.... However, following is a list of statements included in the Report that are unsupported and speculative:

- *"All of the species under consideration can probably move large distances over short time periods when so inclined. These two factors combine to make it hard to limit the spread of their colonies." (page 6)*
  - Coupled with fecundity, mobility is an important "factor" that isn't really a factor at all because the Report states it conjecture. No data is provided to support the references regarding mobility for each of the species.
- *"Conversely, a snake that is placed on the surface of the ground at 5°C will probably survive (it is physiologically capable of surviving 5°C), but such a snake is so cold that it would probably be incapable of protecting itself from a predator (it is not ecologically viable); thus physiological tolerance is a misleading guide to ecological success." (page 11)*
  - The actual statement being made is unclear because of the uncertainty of survival; this is an ambiguous statement without validation or citation—where in the literature is it stated that snakes placed on 5-degree surfaces either survive or die? Please cite references for each of the species.

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<sup>37</sup> See Appendix B for detailed comparison.

- *“Most species can probably aestivate for months to minimize exposure to seasonally inclement weather or food unavailability, but this is not known with assurance.” (page 16)*
  - Despite the admitted uncertainty the Report treats this conjecture as fact throughout the text. Please cite references that state each of the species is capable of and does actually aestivate and for what period of time.
- *“The Indian Python is found virtually throughout the country, though it is probably absent from higher elevations in the extreme north (for example, Kashmir, Arunachal Pradesh) and the extremely arid parts of the Thar or Great Indian Desert along the Pakistan border (Wall, 1912, 1921; Smith, 1943; Deoras, 1965; Whitaker, 1978, 1993; Das, 2002b).” (page 47)*
  - The Report acknowledges this conjecture and yet uses weather stations in both high elevation and extremely arid areas in their climate match baseline dataset, and in exactly the areas recognized as unlikely (see Barker and Barker, 2010).
- *“We are aware of no systematic data collection on the availability of burrows in the United States, though natural crevices service the needs of hibernating snakes in localities such as Manitoba, well north of the area climatically suitable for P. molurus (Fig. 4.5).”*
- *“Much of the southeastern United States has Gopher Tortoise burrows that are probably suitable.” (page 64).*
  - The example of four-ounce garter snakes in Canada is used to justify the conjecture that pythons *might* find tortoise burrows in Florida as suitable shelter. Please cite references describing the use of tortoise burrows as shelter for each of the species.
- *“We are aware of no specialized reproduction requirements of this species, which broods its eggs but does not show shivering thermogenesis as far as we know. Thus it would probably have difficulty incubating eggs in colder climates, which should be reflected in the climate envelope and maps above.” (page 99)*
  - The authors fail to show the temperature range in which reticulated python eggs have been demonstrated to successfully hatch. The implication of the conjecture posed in this statement is that somewhere the eggs will hatch, but the temperature parameters for that possibility are not indicated. The authors need provide references to show that it is possible at all for this species to successfully hatch eggs in nature in North America. There is no evidence that the maps correctly reflect the narrow range of temperature requirements for incubating eggs.
- *“Juvenile Reticulated Pythons would presumably be capable of climbing overhead power lines, though their propensity for doing so is completely undocumented.” (page 100)*

- This is acknowledged to be baseless conjecture in clear violation of the USGS Fundamental Science Policy.
- *“They observed a female reproductive frequency of 13.6 percent of B. c. amarali and 16.7 percent in B. c. constrictor; such a low proportion of reproductive females is probably due to decreased detectability of gestating females combined with the generally low frequency with which very large snakes are accessioned into museum collections.” (page 165)*
  - This is unfounded conjecture with is in direct contradiction to the reproductive rates documented in the published literature.
- *“Waterfowl that are hunted by humans (primarily ducks and geese) would probably experience some level of predation by boas, but this snake is generally less aquatic than are anacondas and (probably) the large pythons, so the relative risk to waterfowl might be lower.” (page 184)*
  - There is no basis for the statement and it is not supported by data.
- *“There are no records of hybridization between E. notaeus and E. deschauenseei, probably due to the rarity/absence of the DeSchauensee’s Anaconda in herpetoculture.” (page 188)*
  - This is baseless conjecture. This sentence follows a discussion of how rarely anacondas hybridize even when different species in captivity are purposely kept together for that purpose.
- *“An additional inference from so low a detection rate is that one should generally assume that roughly 1,000 pythons are present for each one detected in habitats similar to the Everglades. This should not be taken to imply that any individual sighting represents a phalanx of undetected comrades; on average there will be many undetected individuals (to the nearest order of magnitude, about 1,000) for each one detected. Naturally, the exact detection probability is unknown and would presumably increase in areas that are more accessible (for example, the rangelands and agricultural lands of Central Florida), but the realized detectability may be lower on private lands that do not have the large number of visitors and searchers found in the Everglades region.” (page 28)*
  - This is rank speculation. The reader is instructed to assume that there are one thousand times more ‘giant’ constrictors than those actually seen and discovered, living in another unique area of the United States that looks like the Everglades (it just hasn’t been discovered yet). The statement is **inaccurate, biased, and incomplete**. There is no other place in the United States that is like the Everglades and there is absolutely no basis for asserting that there are 1,000 more constrictors were one is seen.

- *“Much of the southern United States has medium-size mammals (skunks, raccoons, foxes) that would provide suitable burrows. However, there well may be places where small burrows (for example, under wind-thrown root balls) are available, but climatically buffered large burrows (dug burrows or large natural crevices) are rare.” (page 64)*
  - Burrows of fox and skunk are too small for anything but small examples of the large constrictors; and certainly for the ‘giant’ constrictors identified by the USGS. Raccoons do not burrow. The authors should provide reference to data on actual burrow construction, size, availability, density, and source of shelters that they suppose exists. The authors need to provide reference to shelter provided by a “wind-thrown root ball”. If the authors cannot provide evidence of suitable winter shelter, then the conclusions of the entire report are negated.]
- *“In such environments, pythons might not be able to overwinter, or they might be limited to riparian zones where beaver or other digging mammals create burrows.” (page 64)*
  - There is no data presented in the Report that supports the assumption that the entire continental USA is an environment where pythons can overwinter. Even in south Florida the majority of pythons froze in cold weather of January 2010 (See Avery et al., 2010 and Mazzotti et al., 2010). The Report presents only unfounded conjecture on possible winter shelter and fails to acknowledge the best available data that demonstrates these snakes have no appropriate response mechanisms to fatal cold.
- *“Both poor health and a temperament poorly suited to captivity may increase the odds that problematic individuals are discarded. Observations of multiple individuals in a small area of south Florida indicate that release(s) (whether unintentional or intentional) have certainly occurred.” (page 133)*
  - No data is provided that supports this statement. The Report assumes that large constrictors are released by individual pet owners. The Report fails to substantiate the statement with any data.

As remedy, we request that data be provided to support all of the above statements or that they be removed as biased, inaccurate, and inconsistent with the IQA and the USGS Fundamental Science Policy.

## Original Correction Request #5

*Request that the Constrictor Report be corrected to:*

- *identify the Burmese python (*P. m. bivittatus*) and Indian python (*p. molurus*) as a full species; and*
- *assess the invasion risks of the two species separately using data specific to the species addressed.*

The Constrictor Report treats the Burmese python (*p. m. bivittatus*) as distinct subspecies of the Indian Python (*P. molurus*) and combines biological data and abiotic factors affecting the distribution of both despite the inaccuracy and clear bias this presents. *P. m. bivittatus* has a much smaller native range and climate envelope than does *P. m. molurus*. This has already been raised to the attention of the USGS in a previous USGS paper on Burmese python climate matching. *P. m. bivittatus* was originally recognized as a full species by Kuhl in 1820. Jacobs et al. (2009) recently published a paper in the journal *Sauria*<sup>11</sup> in which they not only elevate *P. m. bivittatus*, but also reassess *P. m. molurus* and elevate it to a specific rank. The Constrictor Report fails to acknowledge the Jacobs et al. paper nor other credible sources that have questioned the legitimacy of the Burmese python as a subspecies of *P. molurus*.

The Constrictor Report also neglects to acknowledge that the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) recognizes these snakes as separate biological entities and assigns them different protection status. *Python molurus molurus* is listed on Appendix 1, the most restricted list, and is no longer imported for commercial purposes.

The distinctions between the two species are clear and documented. However, the data set used to create the current version of Chapter 4 combines 50 records for the Indian Python and 88 records for the Burmese python; an additional 11 records are for weather stations near to localities of both species in Bangladesh, Nepal, and northern India. The data for the two species must be separated, and all estimates, predictions and analyses for the two species must be done separately and independently recognizing and accounting for differences in habitat and climate requirements.

Insistence on combining these two species into one demonstrates a clear bias, and is inaccurate, both inconsistent with the provisions of the IQA, and we request correction accordingly. In fact, lumping together two species, making it one, is directly impacting related rulemaking currently being carried out by the FWS for these same species.

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<sup>11</sup> Jacobs, H. J., M. Auliya, and W. Bohme, 2009. Zur Taxonomie des Dunklen Tigerpythons, *Python molurus bivittatus* KUHL., speziell der Population von Sulawesi. *Sauria* 31(3): 5-16.

## USGS Letter 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.

### APPEAL OF USGS RESPONSE DECISION AND REQUEST FOR REMEDY

The USGS state they are not required to consider a paper that was not available at the time of the preparation of the Report. In fact, the IQA Guidelines address this issue specifically, and state that if a report becomes highly influential, say in the case where it becomes the basis for a rulemaking, that report must be corrected<sup>38</sup>, as long as the Report is still being disseminated. In addition, while the most recent paper was perhaps not available, certainly the expertise of the FWS in its role as CITES Administrator has recognized these as separate species. The FWS, as the expert agency merits deference in such matters, particularly when supported as it is in the literature. There is no basis for the USGS, without substantial evidence, arbitrarily deciding what is or is not a species, particularly when the expert agency has opined.

Therefore, since the Report is still being disseminated by the USGS, and is being used as the basis for a rulemaking, as remedy we request that the USGS make the identified correction.

#### Original 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.*

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<sup>38</sup> See Request for Correction 3 for a quotation from the OMB Guidelines that have been adopted by the USGS in total.

- ***"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)***

The statement is unclear, inaccurate, biased, and incomplete. It fails to acknowledge that during the given 30-year period, 618, 872 Boa Constrictors were imported, followed by Burmese Pythons (297,443), Reticulated Pythons (147,485), North African Pythons (32,728), Green Anacondas (13,262), with Yellow Anacondas trailing at 1,968. There is no record of South African Pythons, Beni Anacondas or DeShaunsee's Anacondas being imported. To date, there is no information of any living specimens in the United States at this time. Statements to the contrary are speculative at best. The statement fails to make clear that there is no record of importation of African Pythons, Beni Anacondas or DeShaunsee's Anacondas and instead by lumping all importation numbers together, it implies that those species were among the snakes imported.

There is no basis for finding these two species pose a risk and we request that the Constrictor Report be corrected to acknowledge that no data exists supporting an assertion that they have been imported into the United States, in the 30 years since records have been kept, nor are these species living in the United States at this time.

#### **USGS Letter 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.

#### **APPEAL OF USGS RESPONSE DECISION AND REQUEST FOR REMEDY**

The USGS response acknowledges the error identified in our request for correction. The presence of some accurate statements in a document that also contains inaccurate statements, does not absolve the Agency from their responsibility to correct the erroneous statements. The competing statements are unclear and the statement that has been identified is still inaccurate.

The USGS does not dispute the inaccuracy of the statement identified. Therefore, we request correction as remedy.

### Original 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.*

- *'The Boa Constrictor has established more introduced populations than any other boa or python species of which we are aware, with at least three known populations. 11 (page 158; paragraph 5)*
- *"Ninety-six individuals [Boa Constrictors] were captured between 1989 and 2005. . . . However, most (around 70 percent) of the Deering snakes were found in 1996, when at least two females must have given birth in the park. (page 159; paragraph 1)*
- *"Snow and others . . . suggested that the invasive population at the Deering Estate at Cutler may be limited by climate, and that reproduction may be successful only during years with especially warm winters, such as occurred in 1996; they support this idea by saying that the boas appear to be of northern South American stock and thus unlikely to be adapted to cooler temperatures. 11 (page 160; paragraph 6)*

The three introduced Boa populations are found in Aruba, Cozumel (Mexico), and Deering Estate (Florida). Aruba is a narrow tropical island about 21 miles long, located at 12 degrees, 30 minutes, north latitude, situated about 20 miles offshore from the South American mainland and the natural range of boas. Cozumel is a tropical island, 30 miles by about 10 miles. located at 20 degrees, 30 minutes, north latitude, situated about 12 miles east on the Yucatan Peninsula of Mexico and within the natural range of boas.

There is a small population located in South Miami in the Deering Estate, a Miami park. This population is located at about 25 degrees, 30 minutes, north latitude. close to the latitude and longitude that describes their natural range. The Deering Estate is 444 acres in size. but Boa Constrictors are usually observed in a small area within the park, In the nearly 40 years that the snake has been observed, it has not significantly expanded its numbers or territory. The Constrictor Report provides no evidence that the risks identified in the report have actually materialized in the area these snakes occupy. The population of boas at the Deering Estate are not expanding and, ignoring the babies of 1996, an average of less than two boas a year were observed.

The statements in the Constrictor Report noting that boa constrictors has established more introduced populations than any other boa or python species is biased in that it is not complete or clear. It implies that boas are likely to easily establish and expand their 19 populations, more so than other snakes. In fact, the boas have only been established in areas within their normal range and have failed to expand into other areas of South Florida despite being established for at least 40 years.

### **USGS Letter 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.

## APPEAL OF USGS RESPONSE DECISION AND REQUEST FOR REMEDY

Our request for correction is based on the fact that the information included in the report was **incomplete and unclear**. As written the Report gave the impression that these species were expanding into new territories beyond their normal ecological niche and doing so more rapidly and in environments where they had been heretofore unknown.

The USGS recognizes the fact that the information provided was incomplete by stating our request appears to be requesting additional detail. The USGS also recognizes their Report is unclear and incomplete by acknowledging that the information is not included in the Report itself and that it is only available in the primary literature citations. However, by excluding this information the Report fails to provide important context for its statements referencing the supposed spread of these species and thus provides **information that is unclear and incomplete**.

As a remedy, we request that the corrections be made in order to comply with the requirements of the IQA -- that highly influential information disseminated by the USGS be clear and complete.

### Original 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.<sup>39</sup>*

The statement is inaccurate, biased, and incomplete. We are unaware of any data to support speculation that such colonization can or has occurred. In 30 years of monitoring the Burmese python in the Everglades it is hard to imagine that no one has noticed an even larger snake, *Python sebae*.

The range of the Northern African Python is centered on the equator. It is a truly equatorial tropical species that ranges from about 17 degrees north latitude to about 12 degrees south latitude. Based on the available data, all imported specimens since the 1990s have come from West Africa at 7-10 degrees north latitude. --- most or all exported from Ghana, Togo and Benin. There is no climate and no ecosystem in the United States that is even remotely similar to the environment in the natural range of the particular *Python sebae* that have been imported into the United States. This is confirmed empirically by the fact that no established population exists in the United States.

We request that the Constrictor Report be corrected to include supporting data for the statement that there is an established population of North African Pythons. If none can be produced, then this statement is biased and inaccurate and it and all references to it should be removed.

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<sup>39</sup> Page 1

## USGS Letter 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.

## APPEAL OF USGS RESPONSE DECISION AND REQUEST FOR REMEDY

The USGS has not provided a response to the request for correction. While the authors of the report state that such evidence exists, they provide no citation, no report, and no evidence that can be verified.

As remedy, we request that the data of such reproduction be produced or the statements be removed.

### Original Correction Request #9

*Request correction of the speculative statements regarding the existence of hybridization between Burmese python and North African python.*

The Constrictor Report states:

*"The fertility and long-term viability of such hybrids [between Burmese Pythons And Northern African Pythons] is unexplored It is conceivable that introduction Of African genes to the Indian Python population could result in increased genetic variability that could allow exploitation of new ecological or physiological niches and/or result in some other type of hybrid vigor. Such a scenario has become more likely in the face of recent evidence for a population of Northern African Pythons along the western edge of Miami, an area within the introduced range of Indian (Burmese) Pythons. " (page 137; paragraph 2)*

This cannot be characterized as anything other than wild speculation. The statement is biased, inaccurate and incomplete. There is no data that supports the existence of such hybrids. There is data and information on at least 20 different hybrid crosses of python species that have been bred in captivity. While hybrid pythons have been produced through selective captive breeding, offspring show low viability, low fecundity, and, in some cases, sterility. The problems of some hybrids

become more pronounced in successive generations<sup>40</sup>, we request correction as the statements are not based on data and are biased, inaccurate and incomplete.

### USGS Letter 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.

### APPEAL OF USGS RESPONSE DECISION AND REQUEST FOR REMEDY

The USGS response fails to respond to the requested correction. The statement regarding hybridization is a segue into a discussion of increased risk from species that (as we have demonstrated with data) is not expanding into a species which would expand in a rapid and dangerous manner. Specifically this occurs in the statement included in the Report that states:

*"...introduction Of African genes to the Indian Python population could result in increased genetic variability that could allow exploitation of new ecological or physiological niches and/or result in some other type of hybrid vigor. Such a scenario has become more likely in the face of recent evidence for a population of Northern African Pythons along the western edge of Miami, an area within the introduced range of Indian (Burmese) Pythons. " (page 137; paragraph 2)"*

The above statement could not be made, nor its alarmist implications made, if the Report refrained from what is one of the most egregious examples of speculation masquerading as science. A preposterous statement does not become less preposterous because it is acknowledged, and an acknowledged preposterous statement that forms the basis of a subsequent scenario makes the scenario no less equally preposterous. **The USGS Science Practices Policy requiring data, not speculation, be the basis of USGS reports, is violated in the most obvious manner.**

<sup>40</sup> Bull Chicago Herp. Soc.45(1):1-,2010; Review: Giant Constrictors: Biological and Management Profiles and an Establishment Risk Assessment for Nine Large Species of Pythons, Anacondas, and the Boa Constrictor by Robert N. Reed and Gordon H. Rodda 2009. U.S. Geological Survey Open-File Constrictor Report 2009-1202, xviii + 302 pp

The logic used by the USGS in responding to our request for correction would justify the statement that, "it is conceivable that the mythical griffon could be created through gene splicing"... And beginning with that statement a similar scientific report could be produced and used to enumerate the risks associated with introduction of griffons to the continental United States.

The USGS response is specious and dismissive without addressing the fundamental error of using speculation rather than the best available data in examining the risks associated with these species. If every 'conceivable' possibility were considered, it would be easy to quickly enter the realm of the absurd.

Further, while the USGS asserts that such 'conceivable' eventualities were not considered in the risk assessment, it is not possible to determine whether that statement is accurate as the risk assessment process itself is not transparent as required by both the IQA and the ANSTF Guidelines.

As remedy, we request removal of the statement. It is unsupported and not a basis for the risk assessment.

#### **Original 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)*

- *"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)*

The statement is biased, speculative, inaccurate, incomplete and pure imagination. It is astounding that in a paper representing itself as unbiased and serious, there is even mention of such far-flung imaginations as hybridization between Yellow and Green Anacondas. There are records of captive breeding Green Anacondas to Yellow Anacondas. The data on captive hybrid experiments and the speculation of this occurring in the wild among these species or among any of the python species in the Everglades is not comparable to breeding individual specimens in controlled conditions in a limited space in captivity.

The statement regarding spikes in import rates is incorrect, contradicted by data supplied in the Constrictor Report itself. On page 234, the authors state that from 1989 through 2000 about 1400 Green Anacondas were imported into the United States, averaging about 125 a year. However, CITES records cited in Table A.1 on page 302 indicate 5226 Green Anacondas imported during that period, with the spike occurring in 1996, the year before the release of the movie. In addition, if their speculation that the movie *Anaconda* was valid, then one would expect to see another spike in 2004 with the release of the movie "*Anacondas, The Hunt for the Blood Orchid*," but no such spike occurred.

We request that all such speculative and inflammatory statements be removed unless data is included to support them, as they are biased, inaccurate, unclear and incomplete.

### **USGS Letter 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.

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.

### **APPEAL OF USGS RESPONSE DECISION AND REQUEST FOR REMEDY**

While we appreciate the USGS acceptance of one of the changes requested, it is not sufficient. The question of hybridization is important, the likelihood minimal and it should not even be considered in this Report, where there is no basis in data, empirical or otherwise, except to invalidate it as a possibility. It is purely speculative in violation of the USGS Fundamental Science Policy.

Further, while the USG asserts that such 'conceivable' eventualities were not considered in the risk assessment, it is not possible to determine whether that statement is accurate as the risk assessment process itself is not transparent as required by both the IQA and the ANSTF Guidelines.

As remedy, we request that the statement be removed from the Report.

### **Original 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)*

The authors fail to provide any data or reference to substantiate the referenced "livestock losses" on which they base this charge. The statement is unclear, biased, and incomplete as it implies that prize bulls are being attacked and eaten out in the pastures.

The authors fail to provide data describing the livestock losses. We request that the Constrictor Report be corrected to remove statements regarding livestock losses and predation be removed or that data be included that substantiates them.

### **USGS Letter 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

### **APPEAL OF USGS RESPONSE DECISION AND REQUEST FOR REMEDY**

The USGS has not responded to our request for data to support the statements related to predation. The referenced sections of the report are conclusion statements and no citations or data are provided to support the statements. This is inconsistent with the requirements of the USGS Science Practices Policy that the best available data and not speculation be the basis for reports.

As remedy, the statements should be withdrawn unless citations and data are provided in support.

### **Original Correction Request #12**

*Request correction of reference to boas and pythons as 'giant' snakes as the term is scientifically indefensible and biased:*

There is a pattern in the Constrictor Report of referring to "giant constrictors" and "giant snakes" instead of pythons and boas. Use of the term is not scientifically justified and is biased. Most boas and pythons that are encountered in nature are not of "giant" proportions but are rather small to medium sized snakes. The Constrictor Report recognizes this in the following quotation:

- *"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)*

While the Constrictor Report recognizes this is a misapplication of term 'giant' it nevertheless continues to apply the term inappropriately. We request this be corrected as it is biased.

### **USGS Letter Response**

The Merriam-Webster definition of the word 'giant', as applied to nonhumans 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.

### **APPEAL OF USGS RESPONSE DECISION AND REQUEST FOR REMEDY**

The literature is replete with legitimate taxonomic descriptions using the term giant. However, such appellations are generally the result of a published treatise explaining the need for distinguishing two similar species such as the panda, and the giant panda, or the anteater and the giant anteater. In this case, the Report provides no such taxonomic rationale. And while the USGS response provides a post hoc rationalization for its arbitrary rechristening of these 9 disparate, and not even sizeable notable species, there is absolutely no scientific basis for the use of the term giant.

As for the reference to the Merriam-Webster definition of 'giant' we respond with the following cited definitions:

- ❖ a thing of unusually great size, power, importance,
- ❖ unusually large, great, or strong; gigantic; huge
- ❖ a person or thing of exceptional size,
- ❖ remarkably or supernaturally large

Dueling dictionary definitions have no place in a scientific paper. The practice of renaming species in a paper whose purpose is completely different is not a generally accepted scientific practice and there is no scientific or data based rationale provided that supports renaming these species as 'giant'. The purpose is clear and consistent with the bias and inaccuracy already identified in our requests for correction.

Renaming these species, without a measured and argued taxonomic discussion in the appropriate journals has no scientific validity and serves only to bias the discussion related to risk. As remedy, we request that the misnomer be corrected and all references to 'giant' snakes be removed.

### **Original 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; paragraph 2)*

The authors fail to provide any data to substantiate the assertion that such predation is likely to occur.

- *"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; paragraph 2)*

The statements are biased, inaccurate, and incomplete. The Constrictor Report fails to acknowledge that few mothers would encourage their children to swim in creeks and canals in South Florida as most are well aware of the dangers from huge predatory reptiles called alligators already living in essentially all the waterways of Florida, with a concentration in southern Florida. An average alligator weighs more than double what a large great constrictor weighs, and big alligators weigh more than 1000 pounds.

Alligators are known to kill and eat pythons and humans. In addition, the largest venomous pit viper in North America, the eastern diamondback rattlesnake, lives along the pathways through the woods of Florida. Cottonmouths, another deadly snake, abound in the swamps. South Florida is a wonderful place because it is not a tame place. It has always been a place to keep the dog on a leash and the children close and in sight. The presence of great constrictors will not affect what have always been considered prudent and safe actions and activities in South Florida. Yet the authors with clear bias **and** advocacy intimate that freedom of movement in this dangerous environment will be lost as a result of the establishment of these snakes.

- "...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)

The statement is biased **and** unclear. Does "misidentification" mean that volunteers searching for giant snakes might be confused by venomous cottonmouths and grab them? Or does this mean that volunteers might be fatally grabbed by the giant snakes that they are searching for? Or does it mean that hunters might misidentify native snakes as being pythons or boas and fatally shoot them?

- "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)
- "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; paragraph 4)

We request that these clearly biased statements, intended to alarm and advocate for regulation, rather than inform, be removed as they are inconsistent with the requirements of the IQA and USGS Policy.

### USGS Letter 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

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.

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.

## **APPEAL OF USGS RESPONSE DECISION AND REQUEST FOR REMEDY**

The identified statements in the Report address consequences of the species establishment. The Report states that populations in Florida are 'large'. If in fact populations in Florida are **already** large<sup>41</sup> there should be data to support statements regarding the effects on these species on pet predation. Further, if the populations in Florida are 'large' as stated by the Report then the bulleted consequences should already be occurring and the Report must provide data to support the statements.

If however the population is not large, there is no such data, as there would be no such problem.

Accordingly, as remedy, we request that all of the statements be removed or that data supporting them be provided.

### **Original 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)*

The Constrictor Report states that in 14.4 radio telemetered python-years, there were only four detections [of Burmese Pythons] unaided by use of the radio signal. This was during a period of time when there were visitors and searchers in a position to see pythons in the area every day. Despite this, searchers or the public detected the average python about once per three years. Nevertheless, the Constrictor Report refers to this population as a 'large' population.

We request that the biased inaccurate and incomplete references to the generically 'large' python population be replaced with data demonstrating the number of pythons in South Florida and include a frame of reference which allows the reader to gauge the relative importance of the size of the population.

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<sup>41</sup> See discussion of this statement in Correction Request 14.

## USGS Letter 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.

### APPEAL OF USGS RESPONSE DECISION AND REQUEST FOR REMEDY

With respect to the issue of constrictors on power lines, the Report makes the following statement:

*"Juvenile Reticulated Pythons would presumably be capable of climbing overhead power lines, though their propensity for doing so is completely undocumented."*  
(page 100)

We note that even the Report acknowledges there is **no basis** for any speculation that power lines would be affected. We request that the statement be removed.

While the USGS may be content with whatever definition of 'large' one chooses to use, there is no support for such an imprecise definition in a scientific paper. The USGS Fundamental Science Policy requires reliance on data, the IQA requires that information disseminated by the USGS meet minimum quality requirements. Nebulous definitions of 'large', which eschew any quantitative bounds, are not consistent with those policies or laws.

While 1496 pythons may have been collected in and around the Everglades since 2000, which is roughly 150 a year. No data is provided to substantiate the number, the location, whether those pythons were actually removed alive, if they were multiple sightings of the same snake, or if they were bodies of dead pythons killed by the cold.

As remedy, we request that the USGS, using data, define 'large' in some context of the area, in this case the Everglades, being discussed. We request that the data for that statement be provided or included in the report so that the necessary transparency with respect to the analysis is made available to third parties. If no data is available or provided, we request that the statements be removed.

## Original Correction Request #15

**Request that the Constrictor Report be corrected to define 'entry potential' as the risk of entry potential into the natural environment.**

The Constrictor Report defines the risk of "Entry Potential" as the risk of the species surviving importation to the United States. This definition is biased, unclear, inaccurate, and incomplete. By defining Entry Potential in terms of the species surviving importation, the Analysis never assesses the probability of its entry into the natural environment. The Constrictor Report's definition is biased in that it assesses entry potential in a context where care is taken to protect an economic asset. As the Constrictor Report defines it, the Entry Potential assessed has nothing to do with the species likelihood of establishment as an invasive and is thus inaccurate. The Entry Potential assessed is also incomplete as it fails to assess the probabilities or risks of actual entry into the environment (through release, escape, or some other means), which is necessary for establishment as an invasive.

The Entry Potential that must be evaluated is potential for entry into the environment. This clearly differs among species and localities (e.g., where natural disasters are more common) and is impacted by numerous release/escape prevention measures. The Constrictor Report fails to perform this risk assessment and as a result produces an assessment that is inaccurate biased incomplete and unclear as it fails to address the risk of these species entering the natural environment. Accordingly, we request that the Constrictor Report be corrected to address the Entry Potential, not for surviving importation, but for the potential for entry into the environment which is the appropriate risk assessment.

## **USGS Letter 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.

## **APPEAL OF USGS RESPONSE DECISION**

We disagree with the USGS interpretation of the ANSTF Guidelines. The guidelines clearly state:

*"2. Entry Potential-- Estimate probability of the organism surviving in transit. Some of the characteristics of this element include: the organism's hitchhiking ability in commerce, ability to survive during transit, stage of life cycle during transit, number of individuals expected to be associated with the pathway; or whether it is deliberately introduced (e.g. biocontrol agent or fish stocking)."*

This quotation is the sum of the ANSTF statements regarding Entry Potential. After this discussion the Guidance proceeds to discuss assessment of colonization potential:

*"3. Colonization Potential-- Estimate probability of the organism colonizing and maintaining a population. Some of the characteristics of this element include: the organism coming in contact with an adequate food resource, encountering appreciable abiotic and biotic environmental resistance, and the ability to reproduce in the new environment."*

When the ANSTF Guidance with respect to entry potential and colonization are read in context, it is clear that entry potential refers to the potential for the organism entering the wild environment, not simply entering the country. The entry potential guidance clearly anticipates inadvertent introduction or deliberate introduction with unintended consequences. The colonization potential examines the potential for finding a food source and other essential ecological configurations. Colonization potential does **not** consider the potential of moving into the native environment, as that is what the purpose of the entry potential considers.

The USGS stated interpretation of the ANSTF Guidance is strained and when examined in the context of the overall Guidance process, is inconsistent with the process.

As remedy, we request that the original correction request be completed. USGS should apply the Guidance definitions and process completely and in a manner consistent with their intent, rather than **inaccurately** characterizing the instruction and definition in a manner that **biases** the outcomes.

### **Original Correction Request #16**

*Request that the Constrictor Report be corrected to remove derogatory remarks*

The Constrictor Report contains the following 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). ,,]4*

*"However, southern Florida has an acknowledged reputation for unsavory characters, both reptilian and otherwise. ,,15*

The remarks are **biased** and inconsistent with the USGS Science Practices Policy and we request that the document be corrected by removing them. 14 Page 93 (para. 1, line 5), IS Page 101 (para. 1)

### **USGS Letter 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.

## **APPEAL OF USGS RESPONSE DECISION AND REQUEST FOR REMEDY**

We have members who find the statements derogatory. If neither quotation affects the risk assessment, we request that these two derogatory statements be removed as they add nothing to the Report.

**----END OF DOCUMENT----**

# APPENDIX A

## ORIGINAL SUBMISSION OF IQA REQUEST FOR CORRECTION

### DETAILED REQUEST FOR CORRECTIONS

In 2009 the USGS disseminated the Constrictor Report, “Giant Constrictors: Biological and Management Profiles and an Establishment Risk Assessment for Nine Large Species of Pythons, Anacondas, and the Boa Constrictor” (the Constrictor Report).<sup>1</sup> The Constrictor Report is a compilation of, “summaries of the biology of nine very large constrictor species” and considers, “what effects these species may have on ecology, economy, and domestic tranquility of the United States were such snakes to become established.” The Constrictor Report then identifies a ‘perfect storm’ of consequences and risks, all predicated on supposition, assumption and inference, and very few if any predicated on data.

Importantly, the underlying premise to the entire paper is that despite the fact that “...The factors likely to limit this spread [of Burmese Python] are unknown...” they presume that climate is the only factor necessary to consider in their risk analysis.

The Constrictor Report notes that:

*“Common sense dictates that the caliber of a risk assessment is related to the quality of data available about the organism and the ecosystem that will be invaded. Those organisms for which copious amounts of high quality research have been conducted are the most easily assessed”. “The basic natural history of*

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<sup>1</sup> 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 Constrictor Report 2009-1202, 302 p.

*the giant constrictors is largely unknown; our risk assessment reflects this uncertainty.”*

Nevertheless, the Constrictor Report identifies the probability of organism establishment for nine constrictor species: “Very Certain” to “Reasonably or Moderately Certain” for the four factors being used to determine the probability of establishment. There are no uncertainties listed. There is no indication that the risk assessment identified any uncertainty at all. This appropriate identification of uncertainty is key to producing useful risk assessments. The Constrictor Report’s failure to identify risk accurately is underscored by the fact that empirical evidence does not support the identified risks as assessed. Specifically, two of the nine snakes the Constrictor Report identified as certain to expand their range are already established (boa constrictor since the early 1970s and the Burmese python since 1996). To date, there is little indication of these species spreading beyond their current range and there is evidence that even in their current range, climate extremes are limiting the population. There has been sufficient time to properly assess the effect of these two already established populations on domestic tranquility and economic impact, specifically with respect to the likelihood of their spread to other parts of the continental United States in the years since establishment (40 for the boa constrictor and nearly 15 for the Burmese python. Yet, no data substantiating the predictions of the Constrictor Report are identified.

This Constrictor Report is being disseminated by the United States Geological Survey (USGS) and is referenced as the basis for Congressional Legislation and a proposed rule published by the U.S. Fish and Wildlife Service<sup>2</sup> (FWS) which contemplates banning the trade in these 9 species as injurious under the Lacey Act. As such, the Constrictor Report becomes a highly influential scientific assessment with attendant requirements for quality under the Information Quality Act<sup>3</sup> (IQA).

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<sup>2</sup> 75 Fed Reg (Friday, March 12, 2010 ) 11808-11829

<sup>3</sup> OMB’s December 16, 2004 “Final Information Quality Bulletin for Peer Review” defines ‘highly influential scientific assessment: “*A scientific assessment is considered “highly influential” if the agency or the OIRA Administrator determines that the dissemination could have a potential impact of more than \$500 million in any one year on either the public or private sector or that the dissemination is novel, controversial, or precedent-setting, or has significant interagency interest*”.

In addition to the IQA, the contents of the Constrictor Report must comply with the USGS Fundamental Science Practices Foundation Policy (Science Practices Policy). Of particular importance are the following requirements of that policy each of which is violated multiple times in the Constrictor Report:

- Interpretations are presented as honestly and straightforwardly as possible, are without apparent bias, and contain no derogatory remarks or adverse criticism.
- The conclusions are based on the best available **data** interpreted with sound scientific reasoning that **avoids speculation** [emphasis added].
- Information products should not recommend or appear to advocate or prescribe a particular public policy or course of action.<sup>4</sup>

At the direction of Congress, the Office of Management and Budget (OMB) promulgated Guidance for federal agencies implementing the IQA. In addition, Congress required federal agencies to adopt guidelines to ensure the quality of the information they disseminate. The OMB has specific requirements that address highly influential scientific assessments. One requirement is that such assessments must be peer reviewed using standards published by the National Academy of Sciences (NAS). In addition, all information in highly influential scientific assessments must be accurate, complete, clear and unbiased.

This Constrictor Report contains highly speculative and inaccurate information that is biased, unclear, inaccurate, incomplete and as a result is misleading and clearly advocates for regulatory control of these species.

### **CORRECTION REQUEST #1**

*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;*
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<sup>4</sup> From U.S. Geological Survey Manual 502.4 - Fundamental Science Practices: Review, Approval, and Release of Information Products

**2. *by requiring the scope of the review instructions given to peer reviewers to be consistent with that required under the OMB Final Bulletin.***

The USGS must seek an independent peer review of the Constrictor Report as the document is a highly influential scientific assessment. As the OMB has observed, “[p]eer review is one of the important procedures used to ensure that the quality of published information meets the standards of the scientific and technical community”<sup>5</sup>. However, for a peer review to serve its intended purpose, it must be designed and implemented with certain considerations in mind, including the selection of the reviewers and scope of the review.

As a matter of law, all federal agencies – including the USGS – must comply with the Final Bulletin. The Final Bulletin establishes mandatory peer review standards, a transparent process for public disclosure, and opportunities for public input. In selecting its reviewers, the applicable federal agency must consider conflict of interest, independence, expertise, and balance. If peer reviewers are not federal employees, the agency must adopt or adapt the National Academy of Sciences Policy on Committee Composition and Balance and Conflict of Interest (NAS Policy)<sup>6</sup> with respect to evaluating the potential for conflicts. Panel members should not be placed in a situation where others could reasonably question, and perhaps discount or dismiss, the work of the peer review panel simply because of the existence of such conflicting interests.

The OMB Bulletin requires that the agency consider barring participation by scientists with an interest that could be directly affected by the work of the panel. A reviewer should not have a personal stake in the outcome of the review in terms of career advancement, or personal or professional relationships<sup>7</sup>. Further, agencies must make a special effort to examine prospective reviewers’ work as an expert witness, consulting arrangements, scientific and technical advisory board memberships, honoraria and sources of grants and contracts.

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<sup>5</sup> 70 Fed. Reg. (Jan. 14, 2005).at 2664, 2665

<sup>6</sup> [http://www.nationalacademies.org/coi/bi-coi\\_form-0.pdf](http://www.nationalacademies.org/coi/bi-coi_form-0.pdf)

<sup>7</sup> Gary K. Meffe et al, *Independent Scientific Review in Natural Resource Management*, 12 CONSERVATION BIOLOGY 268 (1998).

The Final Bulletin also requires that reviewers be independent and not have participated in the development of the work product<sup>8</sup>. Significant consulting and contractual relationships with the agency sponsoring peer review may raise questions regarding independence. Likewise, when the agency and a researcher work together (e.g., through a cooperative agreement) to design or implement a study, there is less independence from the agency. Additionally, agencies must rotate peer review responsibilities across the available pool of qualified reviewers.

The Final Bulletin provides that “the intensity of peer review should be commensurate with the significance of the information being disseminated and the likely implications for policy decisions”<sup>9</sup>. The Final Bulletin emphasizes “the need for rigorous peer review is greater when the information ... presents conclusions that are likely to change prevailing practices, or is likely to affect policy decisions that have a significant impact.” Specifically, the language included identifies highly influential scientific assessments as requiring the most rigorous peer review available. The Constrictor Report is controversial, and precedent setting, as well as having significant interagency interest as it is used as the basis for the FWS determination with respect to listing the 9 subject species as ‘injurious’ under the Lacey Act as well as influencing Congressional legislation. The Constrictor Report presents conclusions, which if accepted, will result in a change in the prevailing practices and affect policy decisions that will affect the entire industry related to the constrictors addressed in the Constrictor Report. The costs resulting from the prohibition of the commerce of countless reptile breeders and owners as a result of baseless assertions and speculation that these species are on the brink of invading vast portions of the United States could have a cumulative impact of \$500 million or more annually.

Additionally, the Final Bulletin directs agencies “to strive to ensure that their peer review practices are characterized by...scientific integrity” which includes “the identification of the scientific issues and clarity of the charge to the panel [and] the quality, focus and depth of the discussion of the issues by the panel....” Further, “the charge should ask that peer reviewers ensure that scientific uncertainties are clearly identified and

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<sup>8</sup> 70 Fed. Reg. (Jan. 14, 2005). at 2675-2676

<sup>9</sup> 70 Fed. Reg. at 2668

characterized...; ensure that the potential implications of the uncertainties for the technical conclusions drawn are clear...and that they consider value-of-information analyses that identify whether more research is likely to decrease key uncertainties.” The USGS clearly failed in this, as there is no evidence that the reviewers were asked whether there was data to support the speculation included in the Constrictor Report, despite the fact that the USGS Science Practices Policy requires that publications be based on such data.

In a letter to the Senate Committee on Environment and Public Works, 10 research scientists familiar with both publishing in peer-reviewed journals and providing expert reviews of papers, stated that it would be a misrepresentation to call the Constrictor Report “scientific”. They point out that the Constrictor Report lacks an external peer review. They note that only part of the Constrictor Report is fact-driven and that as a result of the authors’ methods the Constrictor Report contains information that is unsubstantiated and, in some cases, contradicts sound existing data. They conclude that, as written, the Constrictor Report is not based on best science practices.

A brief examination of the 20 reviewers identified in the Acknowledgments for the Constrictor Report identified that at least six are government biologists (three work for the USGS and six have either co-authored articles on the “dangers” or “problems” of Burmese pythons in the Everglades, or have been featured in popular media making such statements as have both Reed and Rodda). At least 5 are currently working in South Florida on Burmese python management and eradication.

## **CORRECTION REQUEST #2**

***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.***

The Constrictor Report states that the 11 referenced hypotheses are taken from a table in a recently published paper of one of the authors (see Rodda and Tyrrell, 2008) and that only four of the 11 can be applied. No information is supplied to indicate whether these hypotheses were tested and what data was used to test them. Further, no data is provided to support the determinations found in tables 10.1 through 10.4. Nevertheless, the authors proceed to make determinations based on no data whatsoever, and their confidence in the outcome is inexplicably high.

The table outlining what is known about the reproduction of the nine species of great constrictors is notable for the paucity of data. It appears that little is known about most of the species and nothing is known about the Beni Anaconda or the DeSchaunsee's Anaconda, as they have not been in captivity in decades. The other species have shown little capacity for extended sperm storage. Inter-clutch interval is a year or longer in all the seven species that have been bred in captivity.

The tables illustrating the results of all the risk analyses show likelihood of establishment as high, medium, or low. No species has a risk rated as "Low" --- about half are high and half are medium in each of the tables. To state that a Green Anaconda has roughly the same high probability to establish as, say, a small anoline lizard without any supporting data is clear evidence of bias and of the overall unrealistic assumptions and conclusions made in the Constrictor Report. Further, there is no evidence that data was used to create an assessment of the probability of establishment across the full range of climate maps. It would be reasonable for it to vary from North to South and East to West but this appears to have been ignored.

We request the USGS provide the required **transparency** with respect to providing sufficient data and information on methods used to allow a qualified third part to substantially reproduce the results shown in Tables 10.1 through 10.3 as well as the high and moderate risk determinations and the certainty level associated with those determinations shown in Table 10.4.

### **CORRECTION REQUEST #3**

*Request that the Constrictor Report be corrected to:*

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

- *Include data where available, that demonstrate species do not survive in areas in the United States which the model identifies as suitable for habitation;*
- *Remove all statements that pythons and boas hibernate, or provide data which supports the statements.*

*Published Peer Reviewed Scientific Model*

The Constrictor Report fails to acknowledge the findings of Pyron et al. 2008, a peer reviewed, published study which directly contradicts the Constrictor Report's findings regarding the potential for expansion of the subject snake species<sup>10</sup>. The Constrictor Report mentions Pyron et al on page 19 and the authors state their belief that the model under-predicts areas of the United States that can be invaded by *Python molurus*. However, the study never rebuts the results of the work. This is the only place in the Constrictor Report where this paper is mentioned. While the OMB Guidelines state that the adequacy of the result of published and peer reviewed work is a rebuttable presumption; the Constrictor Report fails to rebut the findings in Pyron and inadequately explains the basis of the decision to use its modeling approach over that used by Pyron et al. Instead, while acknowledging that multiple factors influence the distribution of an animal, the Constrictor Report relies on only a single factor, climate, to predict the invasiveness of the large constrictors. In addition, the Constrictor Report spends an inordinate amount of time discussing all the possible failings of the ecological niche model which is the basis for the Pyron conclusions without demonstrating that these failings actually exist in the published paper.

The Constrictor Report is **inaccurate** and **biased** in that it ignores superior data and analysis, and instead sensationalizes the real problem of the established population of non-native snakes in southern Florida. The Constrictor Report speculatively expands the threat existing from *Python molurus* in the relatively remote and sparsely populated Everglades in South Florida into the backyards of a significant proportion of the southern to central United States. This is accomplished by limiting the Constrictor Report's habitat suitability model variables to mean monthly temperature and mean monthly precipitation. The model the Constrictor Report relies upon does not include many variables known to influence species distribution, including climatic extremes, vegetative assemblages, predator and prey abundance, impacts or highways, impacts due to

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<sup>10</sup> Pyron RA, Burbrink FT, Guiher TJ (2008) Claims of Potential Expansion throughout the U.S. by Invasive Python Species Are Contradicted by Ecological Niche Models. PLoS ONE 3(8): e2931. doi:10.1371/journal.pone.0002931

agriculture, and impacts due to urbanization. This deliberately naïve approach results in a gross overestimate of potential habitat for these snake species.

While the model developed by Pyron and colleagues is not perfect, it does use a greater complexity of environmental characteristics. As a result, the model more accurately predicts the actual incidence of feral populations of these snakes. The Pyron model limits the suitable habitat for the Burmese python within the continental United States to the extreme tip of Texas and southern Florida. Noteworthy, despite its extremely limited prediction of suitable habitat, the model does include the Everglades, the lone location of an established population in the United States.

#### *Data Contradicts Model Results*

Pythons are kept as pets throughout the United States, yet the only known feral breeding population in the United States is in the Everglades. The Constrictor Reports states that “all of the species under consideration can probably move large distances in short time periods when so inclined.” But the Report provides no explanation for the failure of already established populations to expand. This failure to expand suggests that factors beyond those considered in the USGS model are critical to limiting the suitability of habitat for pythons. The Constrictor Report is **biased, incomplete and inaccurate** as it fails to acknowledge this existing data and instead substitutes hypothetical model outputs and speculation.

The USGS Constrictor Report predicts clearly unsuitable habitats to be suitable habitat for both Burmese pythons and boa constrictors. For example, the oversimplified USGS model predicts portions of the deserts of the American Southwest are suitable habitat for both Burmese pythons and boa constrictors. While snakes are quite adept at going long periods without eating, the large size of the subject snakes requires a reasonable presence of suitable medium and large prey species. Such prey resources do not exist in challenging environments such as the deserts of the American Southwest (most native desert snakes species are typically well under one meter). Nevertheless, the Constrictor Report asserts that portions of these deserts are suitable habitat for both Burmese pythons and boa constrictors. The assertion also ignores the fact that Boa constrictors are native to Mexico but their northern distribution abruptly ends where the tropical deciduous forest and tropical thorn scrub give way to Sonoran Desert, providing evidence of a weather or geographic barrier that commences with the desert. Nevertheless, the

Constrictor Report asserts the validity of its predictions despite clear evidence that boa constrictors do not tolerate southwestern deserts. The Constrictor Report's suitability map for this species inaccurately includes wide expanses of Chihuahuan Desert and Upland Arizona habitat within the Sonoran Desert.

Another example of the inadequacies of the model supporting the Constrictor Report is that it predicts extreme South Texas to be suitable climate and habitat. While this is plausible in theory and based solely on climate, review of the environmental conditions quickly demonstrate its improbability. There are major differences between South Florida, where only one of the 9 species has become established, and the Rio Grande Valley in the southernmost tip of Texas. First, there are no extensive wild areas similar to the Everglades National Park that serves as a 1.5- million acre, swampy refugium. More than 95% of the original Tamaulipan thorn scrub habitat found in this part of Texas is gone. It has been replaced with fields of onions, carrots and other produce such as sugar cane. The sugar cane fields are surrounded and burned from all sides simultaneously either annually or biannually, killing all wildlife hidden in the thick vegetation. There is heavy traffic on most roads day and night, and mechanized agriculture would affect the snake's survival ability. Boa Constrictors naturally occur in Tamaulipas, Mexico, 120 miles from the southern tip of Texas, but show no evidence of extending their range northward. There is no data or empirical evidence to support a conclusion that these snakes are likely to expand into southern Texas, rather much information and data demonstrates they have not.

We request that the USGS correct the **inaccurate, incomplete, and biased** information provided in the report that asserts the subject snakes can expand into these habitats, by including complete information regarding the environmental needs of the species beyond that of climate.

#### *Python Cold Tolerance*

The Constrictor Report further is **biased, incomplete and inaccurate** in that it ignores documented sensitivity to cold in predicting suitable habitats. The Constrictor Report states that the Burmese python is exceptional among the giant snakes in its ability to tolerate cold weather. The relative nature of this statement has been demonstrated by the recent cold weather event that hit the southeastern United States. While the cold was atypical it was not unheard of for the region, and its impact on Burmese pythons is

worthy of mention. After the cold weather event, about 50% of the pythons found in southern Florida were dead and 5 OF 9 pythons housed in outdoor enclosure with heating pads provided at a research facility in northern Florida died, 2 became ill and were brought inside, and 2 survived using provided heating pads. The sensitivity of the species to this extreme weather event in Florida questions the likelihood of persistent python populations in areas of the United States included in the Constrictor Report as suitable habitat where such weather events are much more frequent and much more extreme. Again, real data is available but hypothetical speculation is used.

The USGS received information that pythons and tropical boas do not appear to make the distinction between fatally cold and uncomfortably cold. Pythons are descended from tropical populations of animals where freezing weather is unknown. The ability to shelter from fatally cold temperatures is unnecessary in their native ranges where fatal cold extremes are unknown.

#### *Transparency of Data and Methods*

The USGS model grossly overestimates the potential habitat for these snake species. No introduced reptile maintains such a wide distribution in the United States, with the most widely distributed species being the Mediterranean gecko, a species that mostly inhabits human dwellings rather than the natural habitat across its distribution. People throughout the United States have kept the snake species, which are the subject of the Constrictor Report, as pets for decades. Yet the only known feral breeding populations in the United States are in the Everglades. Such a wide distribution of potential sources of invasion, but only a localized invasive event, leads one to the conclusion that factors beyond those used in the USGS model are critical to limiting the suitability of habitat for pythons.

The USGS, instead of using an available, published, peer reviewed model, used a simple climate based model as the basis of the Constrictor Report. Our review indicates that the map forming the basis for all USGS's climate-space estimates of these pythons is incorrect. The depiction of the distribution is simplistic and overestimates the presence of these species at high elevations -- across the northern limit of the species from Nepal to Fujian, China.

We request that all records with monthly mean temperatures of 10 degrees or less be removed from the data set, unless the locality is exactly matched to an actual published

locality and similar elevation for a python. There is no data supporting an assertion that pythons can survive mean temperatures of 10 degrees C. The data forming the basis of all the analyses includes localities of the weather reporting stations that are at excessively high elevations. There is no data that supports any assertion that these species are commonly present at elevations exceeding 1000m. However, in the report, 12% of the reporting weather stations are located at elevations that exceed 1000m and several exceed 2000 m. We request that all records exceeding 1000m be removed from the data set, unless locality is exactly matched to an actual published locality with a similar elevation for a python.

The model assumes that these snakes hibernate. In comparing the climate-space data derived from the weather-reporting stations reports to USA climate data, the authors performed two separate climate-matches; one climate-match assumes a 3-month period of hibernation (Clim3) and the second assumes a four-month period of hibernation (Clim4). This assumption appears to be based on one report from 1912, and is otherwise unsubstantiated.

Of the 43 records for weather stations in China, 25 records are located outside of the natural distribution of Burmese pythons, due either to erroneous assumptions made for the geographic distribution or unfounded assumptions about the elevational distribution of the species in China. This amounts to more than 25% of the total records for Burmese pythons on which the report is based as being erroneous.

The Constrictor Report, states that, when possible, the localities of the weather stations used in all analyses are matched closely to the exact localities of the pythons. In fact, the data set incorporates only four records based on actual topographic locations of python specimens out of a total of 149 records. The remaining 145 records are apparently chosen at random around the periphery of the distribution of the two species. In some cases the weather stations are near the published general locations of pythons specimens, this is not so for the majority of the records. For this reason alone—the near complete absence of actual locality records of the species being studied—it is not possible to rely on any of the estimates, analyses, and predictions based on this data without more detail as to methods and data.

The exact means by which the climate space generated for each species in the report was matched to the climate of the USA is not **transparent**. The methods are not described in

detail, nor are any data for the USA localities included in the Report or otherwise made available. The IQA requires sufficient transparency as to data and methods to allow a qualified third party to substantially reproduce the result.

The methods and data used to produce the results of climate matching, which forms the basis of the report, are **not transparent**. The information provided is **not sufficient to allow substantial reproduction of the results by a third party**. The information that is available supports a conclusion that **significant errors** are embedded in the analysis and that the results are **neither reliable nor reproducible**.

We request that the report be corrected to provide sufficient **transparency** to allow a qualified third party to substantially reproduce the results in the Constrictor Report.

#### **CORRECTION REQUEST #4**

*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 USGS has built a reputation for scientific excellence. This is in part due to the rigorous standards included in their Science Practices Policy which requires that USGS reports will be based on data. The semantic sleight of hand practiced by the authors of the Constrictor Report relies on the USGS reputation while in fact disseminating information which fails to comply with the requirements of the IQA and the USGS Information Quality policies.

Throughout the Constrictor Report statements are made without supporting data either in the Constrictor Report itself or in citations. There is an inordinate use of qualifying terms necessary to rationalize the Constrictor Report's speculative comments. More than one out of every hundred words in the manuscript is a word that allows unsupported statements to be included without requiring a disclaimer.

Following is a compilation of selected specific examples of bias in the Constrictor Report. This list is not complete, but is designed to highlight some of the more egregious

examples. Such bias does not comply with the requirements of the IQA as well as USGS 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)*

This statement is clearly **biased**. No information is provided as to how much of the commercial trade passes through South Florida, nor how those numbers have changed over time. Further, the security of the transportation method used is more indicative of the risk of escape. If the South Florida commercial reptile trade has a higher than normal incidence of escape, that data should be provided to support a finding that there is some elevated risk. Otherwise, the statement is merely pejorative and demonstrates an unfounded bias.

It is more likely that South Florida has the only suitable conditions in the United States for any of the nine species considered in this Constrictor Report. The climate of South Florida is the only subtropical zone in the continental United States. More importantly, the 1.5-million acres of the Everglades National Park provide a unique swampy refugium and no other place in the United States is even remotely similar. Established exotic constrictor populations exist in Florida but there is no data which supports the assertion that that this will expand beyond Florida.

Such bias and advocacy are not consistent with the requirements of the IQA or USGS Policy. Therefore we request correction.

- *“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)”*

The statement is clearly **biased** in that it implies many portions of the United States are in danger of colonization by at least one of the giant constrictors. There is no evidence to support this assessment. In fact, the cold spell of January 2010 and resulting mortality demonstrates that these snakes have little chance to survive in colder climates.

- *“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)*

This statement is **biased, speculative, inaccurate, incomplete**, and misleading. There is no information supporting the statement that any one of these snakes have sufficient mobility in terms of time and space to migrate any substantial distance. There is documentation that Burmese pythons can migrate several miles to return to a preferred location. However, there is no information, citations, studies or empirical data supporting a conclusion that any of the 9 species examined are capable of migrating vast distances across inhospitable terrain to colonize the entire United States, or even the selected portions of the United States identified by the Constrictor Report’s grossly exaggerated definition of available habitat.

In the 30 or so years that boas and Burmese pythons have resided in South Florida, there has been no “spread of their colonies”. The Report states, “all of the species under consideration can probably move large distances in short time periods when so inclined.” However, the Report contains no explanation as to why *Python molurus* failed to expand to reach areas north of the Everglades system since first being found there in 1996? The Report also fails to explain the boa constrictor’s failure to expand. This species has had only a very localized sustained breeding population since first identified in the 1970s. Clear sources of potential invasion, but no expansion, provide evidence that the factors used in the USGS model fail to capture essential characteristics of suitable habitat for these snakes.

We request the USGS correct the Constrictor Report to remove speculative statements regarding the ability to migrate to other parts of the country, and replace the **speculative** statements with statements which are supported by data. This is consistent with the requirements of the IQA and the USGS Science Practices Policy. We request the USGS to correct the Constrictor Report to remove **incomplete** and **inaccurate** information, referring to the ability for these snakes to move large distances over short periods of time, and replace the statement with specific information supported by data.

- *“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. . . . ” (Page 9; paragraph 3)*

The Constrictor Report admits there is absolutely no applicable knowledge regarding their management and little regarding their biology. Yet the Constrictor Report goes on to **inaccurately** apply unsuccessful management methods associated with two vastly different and unrelated snake species. No explanation based on similarities or data was made to justify this use of two surrogate species. Accordingly, we request that the Constrictor Report be corrected to provide **complete** information regarding the differences between the surrogate and the 9 species addressed by the Constrictor Report and include biological information that justifies the use of these snakes as surrogates for the nine large constrictors covered by the Constrictor Report.

- *“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)*

The authors reference the devastation wrought on the native bird populations in Guam as snakes were introduced to an island which formerly had no snakes. This statement is clearly biased in that it implies such devastation should be expected as a result of any or all of the 9 snakes, which are the subject of the Constrictor Report, become established anywhere in the continental United States and particularly in the Everglades system.

The Constrictor Report fails to disclose or acknowledge that, unlike Guam, there are no bird species in the Everglades that are naive to snake predation. Further, it fails to note that no such devastation has occurred in the 15 years Burmese pythons have been established and the roughly 40 years that boa constrictors have been established. The statement is **biased, incomplete and inaccurate** and we request its correction.

#### **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.*

The Constrictor Report treats the Burmese python (*P. m. bivittatus*) as distinct subspecies of the Indian Python (*P. molurus*) and combines biological data and abiotic factors affecting the distribution of both despite the inaccuracy and clear bias this presents. *P. m. bivittatus* has a much smaller native range and climate envelope than does *P. m. molurus*. This has already been raised to the attention of the USGS in a previous USGS paper on Burmese python climate matching. *P. m. bivittatus* was originally recognized as a full species by Kuhl in 1820. Jacobs et al. (2009) recently published a paper in the journal *Sauria*<sup>11</sup> in which they not only elevate *P. m. bivittatus*, but also reassess *P. m. molurus* and elevate it to a specific rank. The Constrictor Report fails to acknowledge the Jacobs et al. paper nor other credible sources that have questioned the legitimacy of the Burmese python as a subspecies of *P. molurus*.

The Constrictor Report also neglects to acknowledge that the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) recognizes these snakes as separate biological entities and assigns them different protection status. *Python molurus molurus* is listed on Appendix 1, the most restricted list, and is no longer imported for commercial purposes.

The distinctions between the two species are clear and documented. However, the data set used to create the current version of Chapter 4 combines 50 records for the Indian Python and 88 records for the Burmese python; an additional 11 records are for weather stations near to localities of both species in Bangladesh, Nepal, and northern India. The data for the two species must be separated, and all estimates, predictions and analyses for the two species must be done separately and independently recognizing and accounting for differences in habitat and climate requirements.

Insistence on combining these two species into one demonstrates a clear bias, and is inaccurate, both inconsistent with the provisions of the IQA, and we request correction

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<sup>11</sup> Jacobs, H. J., M. Auliya, and W. Böhme. 2009. Zur Taxonomie des Dunklen Tigerpythons, *Python molurus bivittatus* KUHL, speziell der Population von Sulawesi. *Sauria* 31(3): 5–16.

accordingly. In fact, lumping together two species, making it one, is directly impacting related rulemaking currently being carried out by the FWS for these same species.

#### **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)*

The statement is **unclear, inaccurate, biased, and incomplete**. It fails to acknowledge that during the given 30-year period, 618, 872 Boa Constrictors were imported, followed by Burmese Pythons (297,443), Reticulated Pythons (147,485), North African Pythons (32,728), Green Anacondas (13,262), with Yellow Anacondas trailing at 1,968. There is no record of South African Pythons, Beni Anacondas or DeShaunsee's Anacondas being imported. To date, there is no information of any living specimens in the United States at this time. Statements to the contrary are speculative at best. The statement fails to make clear that there is no record of importation of African Pythons, Beni Anacondas or DeShaunsee's Anacondas and instead by lumping all importation numbers together, it implies that those species were among the snakes imported.

There is no basis for finding these two species pose a risk and we request that the Constrictor Report be corrected to acknowledge that no data exists supporting an assertion that they have been imported into the United States, in the 30 years since records have been kept, nor are these species living in the United States at this time.

#### **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.***

- *“The Boa Constrictor has established more introduced populations than any other boa or python species of which we are aware, with at least three known populations.” (Page 158: paragraph 5)*
- *“Ninety-six individuals [Boa Constrictors] were captured between 1989 and 2005. . . . However, most (around 70 percent) of the Deering snakes were found in 1996, when at least two females must have given birth in the park. (Page 159; paragraph 1)*
- *“Snow and others . . . suggested that the invasive population at the Deering Estate at Cutler may be limited by climate, and that reproduction may be successful only during years with especially warm winters, such as occurred in 1996; they support this idea by saying that the boas appear to be of northern South American stock and thus unlikely to be adapted to cooler temperatures.” (Page 160; paragraph 6)*

The three introduced Boa populations are found in Aruba, Cozumel (Mexico), and Deering Estate (Florida). Aruba is a narrow tropical island about 21 miles long, located at 12 degrees, 30 minutes, north latitude, situated about 20 miles offshore from the South American mainland and the natural range of boas. Cozumel is a tropical island, 30 miles by about 10 miles, located at 20 degrees, 30 minutes, north latitude, situated about 12 miles east of the Yucatan Peninsula of Mexico and within the natural range of boas.

There is a small population located in South Miami in the Deering Estate, a Miami park. This population is located at about 25 degrees, 30 minutes, north latitude, close to the latitude and longitude that describes their natural range. The Deering Estate is 444 acres in size, but Boa Constrictors are usually observed in a small area within the park. In the nearly 40 years that the snake has been observed, it has not significantly expanded its numbers or territory. The Constrictor Report provides no evidence that the risks identified in the report have actually materialized in the area these snakes occupy. The population of boas at the Deering Estate are not expanding and, ignoring the babies of 1996, an average of less than two boas a year were observed.

The statements in the Constrictor Report noting that boa constrictors has established more introduced populations than any other boa or python species is **biased in that it is not complete or clear**. It implies that boas are likely to easily establish and expand their populations, more so than other snakes. In fact, the boas have only been established in areas within their normal range and have failed to expand into other areas of South Florida despite being established for at least 40 years.

#### **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.*<sup>12</sup>

The statement is **inaccurate, biased, and incomplete**. We are unaware of any data to support speculation that such colonization can or has occurred. In 30 years of monitoring the Burmese python in the Everglades it is hard to imagine that no one has noticed an even larger snake, *Python sebae*.

The range of the Northern African Python is centered on the equator. It is a truly equatorial tropical species that ranges from about 17 degrees north latitude to about 12 degrees south latitude. Based on the available data, all imported specimens since the 1990s have come from West Africa at 7–10 degrees north latitude --- most or all exported from Ghana, Togo and Benin. There is no climate and no ecosystem in the United States that is even remotely similar to the environment in the natural range of the particular *Python sebae* that have been imported into the United States. This is confirmed empirically by the fact that no established population exists in the United States.

We request that the Constrictor Report be corrected to include supporting data for the statement that there is an established population of North African Pythons. If none can be produced, then this statement is biased and inaccurate and it and all references to it should be removed.

#### **CORRECTION REQUEST #9**

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<sup>12</sup> Page 1

***Request correction of the speculative statements regarding the existence of hybridization between Burmese python and North African python.***

The Constrictor Report states:

*“The fertility and long-term viability of such hybrids [between Burmese Pythons and Northern African Pythons] is unexplored. It is conceivable that introduction of African genes to the Indian Python population could result in increased genetic variability that could allow exploitation of new ecological or physiological niches and/or result in some other type of hybrid vigor. Such a scenario has become more likely in the face of recent evidence for a population of Northern African Pythons along the western edge of Miami, an area within the introduced range of Indian (Burmese) Pythons.” (Page 137; paragraph 2)*

This cannot be characterized as anything other than wild speculation. The statement is **biased, inaccurate and incomplete**. There is no data that supports the existence of such hybrids. There is data and information on at least 20 different hybrid crosses of python species that have been bred in captivity. While hybrid pythons have been produced through selective captive breeding, offspring show low viability, low fecundity, and, in some cases, sterility. The problems of some hybrids become more pronounced in successive generations<sup>13</sup>. We request correction as the statements are not based on data and are biased, inaccurate and incomplete.

**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)*

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<sup>13</sup> Bull. Chicago Herp. Soc. 45(1):1-, 2010; Review: *Giant Constrictors: Biological and Management Profiles and an Establishment Risk Assessment for Nine Large Species of Pythons, Anacondas, and the Boa Constrictor* by Robert N. Reed and Gordon H. Rodda 2009. U.S. Geological Survey Open-File Constrictor Report 2009-1202, xviii + 302 pp

- *“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)*

The statement is **biased, speculative, inaccurate, incomplete** and pure imagination. It is astounding that in a paper representing itself as unbiased and serious, there is even mention of such far-flung imaginations as hybridization between Yellow and Green Anacondas. There are records of captive breeding Green Anacondas to Yellow Anacondas. The data on captive hybrid experiments and the speculation of this occurring in the wild among these species or among any of the python species in the Everglades is not comparable to breeding individual specimens in controlled conditions in a limited space in captivity.

The statement regarding spikes in import rates is incorrect, contradicted by data supplied in the Constrictor Report itself. On page 234, the authors state that from 1989 through 2000 about 1400 Green Anacondas were imported into the United States, averaging about 125 a year. However, CITES records cited in Table A.1 on page 302 indicate 5226 Green Anacondas imported during that period, with the spike occurring in 1996, the year before the release of the movie. In addition, if their speculation that the movie *Anaconda* was valid, then one would expect to see another spike in 2004 with the release of the movie *“Anacondas, The Hunt for the Blood Orchid,”* but no such spike occurred.

We request that all such **speculative** and inflammatory statements be removed unless data is included to support them, as they are **biased, inaccurate, unclear and incomplete**.

### **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)*

The authors fail to provide any data or reference to substantiate the referenced “livestock losses” on which they base this charge. The statement is **unclear, biased, and incomplete** as it implies that prize bulls are being attacked and eaten out in the pastures. The authors fail to provide data describing the livestock losses.

We request that the Constrictor Report be corrected to remove statements regarding livestock losses and predation be removed or that data be included that substantiates them.

### **CORRECTION REQUEST #12**

***Request correction of reference to boas and pythons as ‘giant’ snakes as the term is scientifically indefensible and biased.***

There is a pattern in the Constrictor Report of referring to “giant constrictors” and “giant snakes” instead of pythons and boas. Use of the term is not scientifically justified and is **biased**. Most boas and pythons that are encountered in nature are not of “giant” proportions but are rather small to medium sized snakes. The Constrictor Report recognizes this in the following quotation:

- *“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)*

While the Constrictor Report recognizes this is a misapplication of term ‘giant’ it nevertheless continues to apply the term inappropriately. We request this be corrected as it is **biased**.

### **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; paragraph 2)*

The authors fail to provide any data to substantiate the assertion that such predation is likely to occur.

- *“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; paragraph 2)*

The statements are **biased, inaccurate, and incomplete**. The Constrictor Report fails to acknowledge that few mothers would encourage their children to swim in creeks and canals in South Florida as most are well aware of the dangers from huge predatory reptiles called alligators already living in essentially all the waterways of Florida, with a concentration in southern Florida. An average alligator weighs more than double what a large great constrictor weighs, and big alligators weigh more than 1000 pounds. Alligators are known to kill and eat pythons and humans. In addition, the largest venomous pit viper in North America, the eastern diamondback rattlesnake, lives along

the pathways through the woods of Florida. Cottonmouths, another deadly snake, abound in the swamps. South Florida is a wonderful place because it is not a tame place. It has always been a place to keep the dog on a leash and the children close and in sight. The presence of great constrictors will not affect what have always been considered prudent and safe actions and activities in South Florida. Yet the authors with **clear bias and advocacy** intimate that freedom of movement in this dangerous environment will be lost as a result of the establishment of these snakes.

- “ . . . 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)

The statement is **biased and unclear**. Does “misidentification” mean that volunteers searching for giant snakes might be confused by venomous cottonmouths and grab them? Or does this mean that volunteers might be fatally grabbed by the giant snakes that they are searching for? Or does it mean that hunters might misidentify native snakes as being pythons or boas and fatally shoot them?

*“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)*

*“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; paragraph 4)*

We request that these clearly **biased** statements, intended to alarm and advocate for regulation, rather than inform, be removed as they are inconsistent with the requirements of the IQA and USGS Policy.

#### **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)*

The Constrictor Report states that in 14.4 radiotelemetered python-years, there were only four detections [of Burmese Pythons] unaided by use of the radio signal. This was during a period of time when there were visitors and searchers in a position to see pythons in the area every day. Despite this, searchers or the public detected the average python about once per three years. Nevertheless, the Constrictor Report refers to this population as a ‘large’ population.

We request that the **biased inaccurate and incomplete** references to the generically ‘large’ python population be replaced with data demonstrating the number of pythons in South Florida and include a frame of reference which allows the reader to gauge the relative importance of the size of the population.

#### **CORRECTION REQUEST #15**

**Request that the Constrictor Report be corrected to define ‘entry potential’ as the risk of entry potential into the natural environment.**

The Constrictor Report defines the risk of “Entry Potential” as the risk of the species surviving importation to the United States. This definition is **biased, unclear, inaccurate, and incomplete**. By defining Entry Potential in terms of the species surviving importation, the Analysis never assesses the probability of its entry into the natural environment. The Constrictor Report’s definition is biased in that it assesses entry potential in a context where care is taken to protect an economic asset. As the Constrictor Report defines it, the Entry Potential assessed has nothing to do with the species likelihood of establishment as an invasive and is thus **inaccurate**. The Entry Potential assessed is also incomplete as it fails to assess the probabilities or risks of actual entry into the environment (through release, escape, or some other means) which is necessary for establishment as an invasive.

The Entry Potential that must be evaluated is potential for entry into the environment. This clearly differs among species and localities (e.g., where natural disasters are more common) and is impacted by numerous release/escape prevention measures. The Constrictor Report fails to perform this risk assessment and as a result produces an assessment that is inaccurate, biased **incomplete** and **unclear** as it fails to address the risk of these species entering the natural environment. Accordingly, we request that the Constrictor Report be corrected to address the Entry Potential, not for surviving importation, but for the potential for entry into the environment which is the appropriate risk assessment.

### **CORRECTION REQUEST #16**

#### ***Request that the Constrictor Report be corrected to remove derogatory remarks***

The Constrictor Report contains the following 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).”<sup>14</sup>*

*“However, southern Florida has an acknowledged reputation for unsavory characters, both reptilian and otherwise.”<sup>15</sup>*

The remarks are **biased** and inconsistent with the USGS Science Practices Policy and we request that the document be corrected by removing them.

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<sup>14</sup> Page 93 (para. 1, line 5),

<sup>15</sup> Page 101 (para. 1)

## APPENDIX B

### Comparison of similarities between the USGS Brown Tree Snake and Habu Surrogates and the 9 Constrictor Species

	Habu <i>Trimeresurus flavoviridis</i>	Brown Treesnake <i>Boiga irregularis</i>	pythons	anacondas	Boa constrictor	Similarities
<b>Superfamily</b>	Caenophidia	Caenophidia	Henophidia	Henophidia	Henophidia	NONE
<b>Family</b>	Crotalidae	Colubridae	Pythonidae	Boidae	Boidae	NONE
<b>Venomous</b>	yes	yes	no	no	no	NONE
<b>constrictor</b>	no	no	yes	yes	Yes	NONE
<b>morphology</b>	<ul style="list-style-type: none"> <li>•very slender</li> <li>•Laterally compressed</li> <li>•big-headed</li> </ul>	<ul style="list-style-type: none"> <li>•very slender,</li> <li>•Laterally compressed</li> <li>•big-headed</li> </ul>	<ul style="list-style-type: none"> <li>•Heavy-bodied</li> <li>•Round-bodied</li> <li>•Distinct head and neck, but not big-headed</li> </ul>	<ul style="list-style-type: none"> <li>•Heavy-bodied</li> <li>•Round-bodied</li> <li>•Distinct head and neck, but not big-headed</li> </ul>	<ul style="list-style-type: none"> <li>•Heavy-bodied</li> <li>•Round-bodied</li> <li>•Somewhat laterally compressed</li> <li>•Distinct head and neck, but not big-headed</li> </ul>	NONE
<b>Average adult weight</b>	wt <3 kg	wt <3 kg	wt > 4 kg [significantly larger than habus or	wt > 4 kg [significantly larger than habus or	wt > 4 kg [significantly larger than habus or	NONE

			treesnakes]	treesnakes]	treesnakes]	
<b>habitat</b>	Semi-arboreal	Strongly arboreal	terrestrial	Semi-aquatic	Adults are predominantly terrestrial	NONE
<b>distribution</b>	insular	insular	continental	continental	continental	NONE
<b>Feeding mode</b>	Foraging/ambush	foraging	ambush	ambush	ambush	NONE
<b>Readily enters human habitation</b>	yes	yes	no	no	no	NONE
<b>Has had more than \$100 million US tax dollars spent studying it</b>	no	yes	no	no	no	NONE
<b>Successfully controlled or eradicated</b>	no	no	n/a	n/a	n/a	NONE

## APPENDIX C

### FACTUAL AND DATA ERRORS IDENTIFIED IN CLIMATE MAPPING<sup>1</sup>

The map used as the basis for the findings in the Report was published in 2008 and shows a substantial increase in range for *P. molurus* and *P. bivittatus*, beyond any prior publications... A review of the data used to support the new ranges reveals substantial misstatements with respect to presence of the species, reliability and standards used for the data, and a failure to adhere to generally accepted scientific and research practices. It appears, due to their lack of randomness<sup>2</sup>, that the errors in this paper were the result of deliberate manipulation of the data in order to exaggerate the climate match and thus support the *a priori* range assertions of the authors.

Such variations in this map that differ from other published depictions are drawn with little or no regard to actual specimens and localities, suitable elevations, suitable habitats, routes of distribution, or other sound zoogeographic bases. The data set is error-filled, and padded with inappropriate data records. An unexplainable 29% of the weather stations in the data set do not lie within the geographic boundaries of either python species and many weather station localities far exceed reasonable limits of habitable elevation. The authors didn't even go to the effort of restricting their weather station locations to within the boundaries of their own exaggerated range map (Reed and Rodda 2008).

Finally, in response to Barker and Barker 2008 which identified significant errors included in the Reed and Rodda 2008 paper the authors responded that Barker and Barker were, 'partially relying on non peer-reviewed or unpublished information about current distributions'. This Request for Correction relies on most references cited in Rodda et al. (2008) as being the basis of the exaggerated map, plus others. In addition we, like the USGS relied on data received from 1 respected authorities on Asian herpetology. We note that among the 40 references on which Rodda et al. (2008) is based, one is incorrectly cited [Deyang (1986) = Liu (1986)], several are not peer reviewed (Caras, 1975; Whitaker, 1978; and probably Pope, 1961; Minton and Minton, 1973; and McKay, 2006), one is apparently overlooked (McKay, 2006), and one is curiously irrelevant [Vinegar et al. (1970) offers only a review of other citations and adds nothing other than a very general map].

The errors identified below are both general and specific. The General errors address failures to apply commonly accepted scientific research practices to the data. The Specific Errors address failures to

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<sup>1</sup> Unless otherwise noted the identified errors are published in Bull. Chicago Herp. Soc. 45(6):97-106, 2010; **A Critique of the Analysis Used to Predict the Climate Space of the Burmese Python in the United States** by Rodda et al. (2008, 2009) and Reed and Rodda (2009); David G. Barker and Tracy M. Barker Barker and Barker 2010

<sup>2</sup> If the errors were the result of carelessness, rather than deliberate manipulation, one would expect to see errors that both increased and decreased the range of the species. Instead, invariably, the error serves to increase the putative range of the species in question.

accurately portray the specific data. Together, they present a picture of what appears to be a systematic and deliberate failure to present a clear, accurate complete and unbiased assessment of data.

### General Errors

- 97% of the localities selected by the authors are not based on actual python records<sup>3</sup>.
- 33%<sup>4</sup> refer to weather stations used to provide climate data for *P. bivittatus* that are, in fact, outside the range of that species.
- 22%<sup>5</sup> that refer to weather stations used to provide climate data *P. molurus* are, in fact, outside the range of the species
- Of the total 149 records in the data set, nearly 30%<sup>6</sup> refer to weather stations that lie outside the range of either species.
- A number of the weather stations chosen have no record of the species occurring nearby, and use of these data points ignores empirical evidence that the species does not occur at the weather station altitudes and in fact are outside the range of altitude inhabited by the species.

Error	Consequence
The Report fails to precisely and accurately map the locations of the species/weather stations, instead generalizing across vast swaths of land. .	The map more <b>than doubles the range</b> of <i>P. bivittatus</i> in China.  The map fails to discriminate between the ranges of the two species and as a result implies that both species can be found in the entire mapped area, <b>greatly increasing the projected range.</b>
The Report states python localities were matched to weather stations when available; but only 7 of the 149 stations actually had localities and of those only 4 were complete. So the statement misleads the reader to conclude that there is a correspondence between weather stations assumed to represent python presence and actual presence, when in fact, there is not..	There is no real correspondence between presence and the range delineated in the modeling for the Report, but <b>the error greatly increases the range</b> of the species unsupported by data.

<sup>3</sup> Only 7 records of the 149 in the data set contain map coordinates referring to python localities, and three of those are either approximate or incomplete.

<sup>4</sup> 29 of 88 records

<sup>5</sup> 11 of 50 records

<sup>6</sup> 43 records

The authors include weather stations at elevations where pythons are not found.	The map contains areas of unsuitably cold weather as part of the python range and thus <b>exaggerates the climate match and consequently the range of the species.</b>
The Report misstates Pope (1935) as reporting python localities in China at +1500 meters. Pope reports elevations as 1500 feet	The Report triples the elevation at which pythons are found thus greatly (and inaccurately) increasing the range and cold tolerance and consequently <b>increases the range of the species.</b>
The authors use data from weather stations at elevations in excess of 500 m without records of pythons in the near vicinities of those weather stations and without evidence that those pythons are in permanent residence in those localities. The report chooses weather stations at excessively high elevations and latitudes without any records, specimens or sighting of pythons at those elevations and latitudes.	The deliberate error, disingenuously disclaimed, significantly expands the climatological range that can be assumed using the Report's paradigm, thus <b>greatly expanding the range of the python</b> with no supporting data.
There is a strong bias in Pakistan and western India for weather stations that are located in areas with low annual precipitation and that are outside the range of <i>P. molurus</i> . The nine driest weather stations out of the total of 149 in the data set are, in Pakistan. Of these weather stations, five are outside the range of <i>P. molurus</i> as identified even in the exaggerated analysis of Reed and Rodda (2008)	Including dry stations allows an argument to be made that the tolerance of pythons to hot and dry conditions is greater than that supported by empirical data. This supports a climate matching scheme that <b>greatly expands the range of the python.</b>

### Specific Errors

Indonesia	
Error	Consequence
Mapping the coordinates of the weather station identified as "Telukbetung, Beranti" shows that this reporting station is located in Sumatra. <i>Python bivittatus</i> does not occur in Sumatra.	This <b>expands the range of the python.</b>

<b>India and Pakistan Errors</b>	
<b>Error</b>	<b>Consequence</b>
The Report includes as range all of southern Sindh, north to include the districts of Dadu, Naushahro Feroze, and Khairpur, all north of the district of Nawabshah. We can find no record of pythons from those districts.	There is no record of pythons in those areas; the error <b>greatly increases the range of the species.</b>
The Report includes eastern Khairpur, eastern Sanghar, Umerkot, and northeastern Thar Parkar; this area where the southwestern Thar Desert extends into southern Pakistan is sandy desert with dunes.	There is no record of pythons in those harsh, dry areas; the error <b>greatly increases the range of the species.</b>
The Report projects the northwestern range of <i>P. molurus</i> as projecting northwest from Jammu Province in India into Pakistan across the northern reaches of Punjab Province, along the southern boundary of the Pakistan Capital Territory, and on across the province of Khyber-Pakhtunkhwa, including the capital of Peshawar, to the northern Tribal Areas along the Afghanistan border. This is a dramatic increase in area of the distribution of the species as reported in the literature and previously mapped in all accounts.	<i>Python molurus</i> is unknown in the province of Khyber-Pakhtunkhwa and the Tribal Areas, the error <b>greatly increases the range of the species.</b>
The Report fails to recognize that northern range of <i>P. molurus</i> in Pakistan is limited to in protected valleys at 600–800 m elevation in five small districts --- Poonch, Rajouri, Jammu, Udhampur and Kathua.	Only 2 python locality records from northern Pakistan can be located, both in river drainages, and certainly insufficient to support the expansive interpretation of range in the Report.  The Report's error <b>exaggerates the range of <i>P. molurus</i>.</b>
A substantial number of weather stations are located outside the distributions of the two species.	The error <b>expands the range of the python and expands the data set used to create the climate match to include data from prohibitively hot and dry localities, as well as prohibitively cool localities.</b>
60% of the Report's weather stations reports for the Sindh Province of Pakistan are outside the range of <i>P. molurus</i> .	The error <b>expands the range of the python and expands the data set used to create the climate match to include data from prohibitively hot</b>

Chor, Jacobabad and Padidan are clearly outside the range of <i>P. molarus</i>	<b>and dry localities.</b>
Jacobabad remains distinctly outside the range depicted by Rodda et al. (2008). The Jacobabad locality is asserted to be based on a specimen in the California Academy of Science however it was collected at Sujawal, not Jacobabad. Sujawal is well within the range of the species in the Sindh.	The misrepresentation supports an <b>expansion of the range of the python.</b> Jacobabad is the single driest locality in the data set, as well as one of the hottest. Its inclusion affects the climate match to include areas of extremely hot and dry climate.
Padidan is located at the northern margin of the range in the Sindh. Padidan is identified as being in Nawabshah District, but in fact is in Khairpur District and outside the reported range of <i>P. molarus</i> (Minton, 1966; Khan, 2006).	The misrepresentation allows an <b>expansion of the range of the python unsupported by data.</b> Use of the location includes data from a prohibitively hot and dry locality into the data set.
Chor is in sand dune desert. Pythons in southern Pakistan are found in small, scattered localities with restricted mesic conditions not typical of the sand dune deserts of northeastern Thar Parkar.  No recorded locations of pythons support inclusion of this weather station.	Randomly located weather stations in such areas of environmental extremes do not correctly reflect the conditions of microclimate required by pythons. However, incorrectly including them, <b>allows expansion of the range of pythons</b> based on the climate matching paradigm of the Report.
Four of the eight weather stations in the data set from the area of the Punjab Districts, Himachal Pradesh the Jammu Province and lie outside the ranges as depicted in Reed and Rodda (2008)  The weather stations at Murree (2126 m elev) Srinigar (1585 m elev.) and Simla (2205 m elev) are high latitude, high elevation and very cold. There is no evidence that pythons occur anywhere near them.  The fourth problematic weather station is at Multán along the lower stretch of the Chenab River at the southern end of the Thal Desert; the locality is extremely hot and dry, does not meet the ecosystem requirements of pythons and there are no records of pythons.	Randomly located weather stations in such areas of environmental extremes do not correctly reflect the conditions of microclimate required by pythons. However, incorrectly including them, <b>allows expansion of the range of pythons</b> based on the climate matching paradigm of the Report.
One weather station is included in the northern Indian state of Uttarakhand, Mukteswar (2310 m elev.). The westernmost known locality for <i>P. bivittatus</i> is at Corbett National Park, about 80 km to the west of Mukteswar (Barker and Barker, 2008a). The pythons are found there at elevations	Allows the Report to assert a higher cold tolerance and thus <b>greatly expand the range of pythons with no supporting data.</b>

of 250–500 m.	
At 2310 m of elevation, there are no records or other evidence of pythons near Mukteswar. It is an extremely high elevation and extremely cold.	
One weather station in Darjiling (2127m ele.), is identified. There are no records of pythons in Darjiling or nearby	Use of the data point, serves to unjustifiably <b>expand the range of the species.</b>
<b>Nepal Errors</b>	
<b>Error</b>	<b>Consequence</b>
Of the six weather stations in Nepal 50% are outside the range of the species identified in Reed and Rodda 2008.  The stations at Pokhara (833 m elev.), Kathmandu (1337 m elev.), and Taplethok (1372 m elev.) all are north of the identified range.  Two of the stations are more than double the elevation of the maximum record in the country of 550 m (Kabisch, 2002). Interestingly, the citation in the data set to justify these two localities is Kabisch (2002)	The weather stations used are too high, too cold, and not even in the range of the species that are the subject of the study. They serve only to <b>support an expansion of the range of the species.</b> No data supports their use.
<b>China Errors</b>	
<b>Error</b>	<b>Consequence</b>
The data set includes 43 weather stations in China. Of these, 11 weather stations lie distinctly outside of the range as described in Reed and Rodda (2008). Further review finds that 27 are outside the range identified in Barker and Barker (2010).  In other words, based on the best available data, 63% of the Chinese weather stations from which data was used are outside the range of the species.	By including these cold temperature data from sites outside the range, the Report inflates the data to include localities of prohibitively cool and temperate climate. As a result the climate match that follows thus includes much more of the southern U.S. than is reasonable based on data available on the ecological needs of the species.
The bias in China is for weather stations in high, cold places where there are no records of pythons.  The nearest records for <i>P. bivittatus</i> are hundreds of kilometers from these localities. Based on their comments even the authors had doubts on the	By including these cold temperature data from sites outside the recognized range of the species, Rodda et al. (2008) inflated their numbers of cool and temperate climate-spaces, and the climate match that followed thus <b>includes much more of the</b>

validity and relevance of data from these stations because of the elevation and latitude. Nevertheless, the data is used in all analyses and assessments included in the Report...	<b>southern U.S. than is reasonable based on data available</b> on the ecological needs of the species..
<b>Thailand Errors</b> <sup>7</sup> 60% Identified error rate.	<b>Expands the range of the species.</b>
<b>Localities given for Thailand</b>	<b>Data Error</b>
Hua Hin, *	Hua Hin is not a recorded python locality. No published python localities within 100 miles north or south. Outside the margin of error claimed by the paper. <b>Expands the range of the species.</b>
Chantaburi, *	No python ever recorded in that province or to the north or south of that province. Outside the margin of error claimed by the paper. <b>Expands the range of the species</b>
Bangkok, *	No records of pythons ever recorded in Bangkok. Outside the margin of error claimed by the paper. <b>Expands the range of the species</b>
Aranyaprathet, Prachin Buri, Kanchanaburi, Nakhon Sawan	There has never been a python documented in the entire province or within 100km of that location. Outside the margin of error claimed by the paper <b>Expands the range of the species</b>
Mae Sot , *	No recorded pythons for that location. Python locality in that province is over 100km away and differs greatly in climate and habitat. Outside the margin of error claimed by the paper. <b>Expands the range of the species</b>
Thailand N16 E098,	The closest recorded locality is a full degree south.
Thailand was recorded for elevations over 2000 m	This is a gross over-exaggeration; pythons in Thailand have never been found at even 1000 m <b>Expands the range of the species</b>

<sup>7</sup> Based on the August 03, 2010 comments of Michael Robert Cota; Research Associate of the Thailand Natural History Museum/National Science Museum. Mr Cota is a herpetological researcher.