

REVISED RECOVERY PLAN ADDENDUM FOR THE THICK-BILLED PARROT:

INTRODUCTION TO COMMENT/RESPONSE MATRIX

The draft Thick-billed Parrot Recovery Plan Addendum (Recovery Plan; USDI FWS 2012) was completed by the U.S. Fish and Wildlife Service (USFWS) Region 2 (Southwest Region) and the Arizona Game and Fish Department in June, 2012. On June 19, 2012, the FWS announced in the Federal Register the availability for comment of the draft Thick-billed Parrot Recovery Plan Addendum. The 60-day comment period closed on August 20, 2012.

The USFWS received comments (via letter, email, discussion) from 23 government agencies, a Native American Tribe, conservation organizations, universities, professional biologists and ecologists, and individuals who did not identify a particular affiliation. Of these 23 received comments, 8 represented comments from 13 individuals from Mexican government agencies, universities, a conservation organization, and a restoration ecologist. The USFWS and Arizona Game and Fish Department reviewed and provide responses to these comments in the accompanying Comment/Response Matrix.

The USFWS requested peer reviews from 19 government agencies and/or independent scientific reviewers with expertise in biology, conservation, and ecology of parrots or old-growth conifer habitat. Of these 19 peer reviewer requests, 13 were from Mexico. We received 6 peer review comment letters from 3 government offices, 2 universities, and 1 conservation organization in Mexico, representing 10 peer reviewers. We received 7 peer review comments from 3 conservation organizations, 1 university, and 2 unaffiliated parrot and old-growth conifer habitat experts in the U.S.

The remaining 10 review comments from the U.S. and Mexico were from conservation organizations, a Mexican restoration ecologist, and individuals who did not identify an affiliation.

From this material we copied comments *verbatim* (unless otherwise indicated) into the attached spreadsheet. We did not attempt to consolidate similar comments; rather, all comments and their sources are listed and responded to individually, although in some instances similar comment responses refer the reader to a prior response rather than repeating the answers.

Most of the comments we received were of great value in converting the draft revision into the final version, and we thank everyone who took the time to provide their insightful comments. Comments that were incorporated into the final plan are noted in the Response column of the spreadsheet. In some cases we did not agree with the commenter or otherwise elected to not make the requested change in the final revised recovery plan; in those instances our rationales are included as responses in the spreadsheet.

In the spreadsheet, comments are separated by color rows and may continue over multiple cells in the Comment column. Each USFWS response (in Response column) applies to the entire comment, as provided.

Commenter	Affiliation	Comment	Response
Luis Fueyo MacDonald	<p>Luis Fueyo MacDonald Comisionado Nacional de Áreas Naturales Protegidas Camino al Ajusco 200 Colonia Jardines en la Montaña, Delegación Tlalpan México D.F. C.P. 14210, México lfueyo@conanp.gob.mx</p> <p>In coordination with : Oscar Ramírez Flores, Director de Especies Prioritarias para la Conservación, Comisión Nacional de Áreas Naturales Protegidas Camino al Ajusco 200 Nivel 2 Ala Sur Colonia Jardines en la Montaña, Del. Tlalpan, México D.F. C.P. 14210, México oramirez@conanp.gob.mx</p> <p>Jesús Lizardo Cruz Romo Subdirector de Especies Transfronterizas Comisión Nacional de Áreas Naturales Protegidas Camino al Ajusco 200 Colonia Jardines en la Montaña, Delegación Tlalpan México D.F. C.P. 14210 México</p>	<p>Translated from Spanish: In general, it is recommended that the implementation of the proposed actions in the Plan be coordinated with the Protected Areas and with the participation of state governments. In particular, the monitoring efforts in Chihuahua should be coordinated with the Natural Protected Areas and the Regional Office of the National Commission, who already carry out these activities in coordination with Mexican institutions. In addition, for habitat conservation in Mexico, it is advisable to include additional conservation strategies besides the establishment of Protected Natural Areas classified as Refuges; some of these alternatives may be certified areas representing a voluntary process that is coordinated with this National Commission. Similarly, in Mexico we also have other complementary public policies to protected areas, such as Management Units for the Conservation of Wildlife (UMA) that can strengthen conservation efforts for the species. In all these initiatives it should be a priority to consider landowners participation and coordination with CONANP Staff.</p> <p>In particular with regard to the abundance and trends and threats, the information presented is consistent with the information contained in the PACE and presents some recent results that will be used to update the PACE in future revisions, as well as some of the proposed actions that are consistent with our conservation policies that have not been previously included in the PACE.</p> <p>Additionally in section threats based criteria (criteria based Threats, point 5 page 38), and in general in all measures and actions that consider possible translocations, it will be necessary to evaluate the success in previous efforts for recovery and translocations, potential habitat at a regional level, connectivity between areas of distribution and evaluate the effectiveness of these measures in terms of cost-benefits for populations. These evaluations should be conducted prior to conducting any new translocations. Translocations need to comply with the General Wildlife</p>	<p>We clarified that recovery actions may be carried out by third parties.</p> <p>We agree that all actions in Mexico should be coordinated with the appropriate responsible parties in Mexico. We clarify that the role of the U.S. Fish and Wildlife Service is primarily to provide support to Mexico in carrying out Mexico's recovery actions to recover this species.</p> <p>We clarify that CONANP is responsible for the implementation of PACE, and that the actions (tasks) can be performed and funded by the different Protected Areas and Regional offices, and/or with the participation of various partners (third parties) and communities. We add that other effective conservation methods should be considered, including payment for environmental services, conservation easements, forest management plan, hiring community stewards of the habitat, etc. Many entities and methods can be used to conserve habitat and implement conservation measures.</p> <p>We agree that before conducting any new translocations, we must first evaluate the success of previous efforts for recovery and translocations, potential habitat at a regional level, connectivity between areas of distribution, and cost-benefit to TBPA populations. In addition, any potential translocations must comply with the General Wildlife Law and in particular with regard to Article 60 bis 2.</p>

Commenter	Affiliation	Comment	Response
Luis Fueyo MacDonald (continued)	lizardc@hotmail.com	<p>Law and in particular with regard to Article 60 bis 2.</p> <p>Regarding recovery actions (3.1 Outline of recovery actions), it seems important to note that in general the actions to downlist parrots are consistent with the objectives of the PACE, the actions included in the section Estimated time and costs, mostly coincide with the PACE, so we agree with them and with their programming in the coming years, and we will similarly consider these recommendations for future revisions of the PACE.</p> <p>It's important to note that although CONANP is responsible for the implementation of PACE, the actions (tasks) can be performed by the different Protected Areas and Regional offices, and/or with the participation of various partners (third parties) and communities. Also, the regulatory framework in Mexico requires that most projects and actions have an annual timeframe. Similarly, in regards to budget outlays, CONANP reviews proposals submitted for implementation through its annual call for proposals and applies funds for PACE implementation to the Protected Areas or to third parties. However, CONANP cannot ensure long-term funding for all actions needed for implementation. Funds are not necessarily committed to partners for implementation and it is not possible to ensure actions are implemented exclusively with a single organization in the long term.</p> <p>Finally we agree that the criteria for removing the species from the list should be defined in future revisions of the plan, once better technical information is available, more solid scientific knowledge, and once the actions proposed in both the PACE and the Plan Recovery begin to show results and can be evaluated.</p>	

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Elvia de la Cruz Robles	Departamento de Conservación de Especies Prioritarias Dirección de Conservación de los Ecosistemas Instituto Nacional de Ecología – SEMARNAT Periférico Sur 5000, 2o. piso Col. Insurgentes Cuicuilco C.P 04530, México, D.F. Tel. (52 55) 54 24 64 00 ext. 13135	Translated from Spanish to English: Recovery of this species is a matter of common concern. Binational cooperation presents the opportunity to share financial and human goals, objectives, experience, methods and resources. SEMARNAT commends the USFWS adoption of the Pace, and is ready to establish mechanisms for binational cooperation and coordination.	We agree that binational cooperation and coordination is important and have included this in the plan.

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<p>Laura Barragan Navarrete, Fernando Gavito Perez, Alejandro Gomez Nisino for Rocío Janet González Hernández for Maria Elena Rodarte Garcia</p>	<p>Alejandro Gómez Nísino Director APFF Campo Verde y RPC Madera Cd. Cuauhtémoc, Chih. 01625-5905242</p> <p>Rocío Janet González Hernández Unidad Técnica de Conservación y Manejo Tel (614)414-8857 Ext.18320 y 18304 Chihuahua, Chihuahua, México.</p> <p>Maria Elena Rodarte Garcia Directora Regional Norte y Sierra Madre Occidental Av. Universidad 2757 Col. Parques de San Felipe Chihuahua, Chihuahua, México, C.P. 31230</p>	<p>Rocio Janet Gonzalez Hernandez, on behalf of Maria Elena Rodarte Garcia relayed the collective comments of Laura Barragan Navarrete, Fernando Gavito Perez, and Alejandro Gomez Nisino, Directors of ANP and RPC. Translated from Spanish:</p> <p>Per the instructions of Maria Elena Rodarte Garcia , requesting a technical review of the Thick-billed Parrot Draft Recovery Plan Addendum, I present the comments from this technical unit for consideration:</p> <ol style="list-style-type: none"> 1. The document refers to "Technical study justifying", which could be replaced by "Supporting previous study", based on article 45 of the LGEEPA. 2. In point 3.1 Outline of recovery actions, it is important to mention that CONANP is developing management programs for the Janos, Tutuaca and Papigochic ANPs with subzones designed to protect the following nesting sites: Reserva de la Biosfera Janos - Mesa de las Guacamayas-Subzona de Preservación del anteproyecto de Programa de Manejo. Área de Protección de Flora y Fauna Tutuaca – Parte de los Ejidos Tutuaca y Conoachi – Subzona de Preservación del anteproyecto de Programa de Manejo. Área de Prtección de Flora y Fauna Papigochic- Parte de los Ejidos Heredias y Anexas y Javier Rojo – Subzona de Preservación del anteproyecto de Programa de Manejo - <p>SEMARNAT, through CONANP, began biological monitoring in 2011 in protected natural areas based on a new authority (PROMOBI), giving direct grants to institutions of higher education, research, as well as the organizations, to implement conservation actions for theTBPA in the APFF Tutuaca,Papigochic, Campo Verde and RPC Madera, with expansion in 2012 to include the RPC Tarahumara and Cerro Mohinora.</p>	<p>We support and commend CONANP's commitment to fund institutions of higher education, research, and organizations, to monitor these important nesting sites, and to develop a management program to protect these areas. These actions are consistent with the PACE. Information generated through this relatively new CONANP program was used to inform the addendum. In the TBPA Recovery Plan Addendum, we have included as Recovery Criteria for downlisting the need to develop management plans and monitor TBPA breeding and non-breeding habitat to ensure long-term conservation.</p>

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Alejandro Gomez Nisino for Rocío Janet González Hernández for Maria Elena Rodarte Garcia	<p>Alejandro Gómez Nísino Director APFF Campo Verde y RPC Madera Cd. Cuauhtémoc, Chih. 01625-5905242</p> <p>Rocío Janet González Hernández Unidad Técnica de Conservación y Manejo Tel (614)414-8857 Ext.18320 y 18304 Chihuahua, Chihuahua, México.</p> <p>Maria Elena Rodarte Garcia Directora Regional Norte y Sierra Madre Occidental Av. Universidad 2757 Col. Parques de San Felipe Chihuahua, Chihuahua, México, C.P. 31020</p>	<p>Translated from Spanish: Before downlisting, FWS should coordinate with Mexico on the status according to the NOM-059-SEMARNAT-2010 where the species is found listed in danger of extinction. CONABIO funded a national level project to evaluate species classified as in danger of extinction by the NOM. Specialists evaluated each species using, among others tools, the Method of Evaluation of the Risk of Extinction of the wild species in Mexico (MER) and results were published as the NOM .</p> <p>The reference and link is on the CONABIO web page: Monterrubio-Rico, T. C. and Enkerlin-Hoeflich, E. 2008. List of credits of <i>Rhynchopsitta pachyrhyncha</i>. In: Escalante-Pliego, P. (compiler). "Files on bird species included in the Project of Mexican Official Norm PROY-NOM-ECOL-2000. Part 2". Institute of Biology, Autonomous National University of Mexico. Databases SNIB-CONABIO. Project No. W042. Mexico. D. F. http://www.conabio.gob.mx/conocimiento/ise/fichasnom/Rhynchopsittapachyrhyncha00.pdf</p>	<p>We agree with the comments and intend to coordinate closely with Mexico on the TBPA's status throughout the recovery process, following Mexico's lead. Reaching TBPA downlisting recovery goals would not occur without the efforts of Mexico. Any potential proposal to downlist the TBPA would need to be discussed with Mexico and should be consistent with the direction in the future versions of the PACEs. As suggested, we included Monterrubio and Enkerlin (2008) and additional information regarding the NOM.</p>
Javier Cruz Nieto and Miguel Ángel Cruz Nieto	<p>Javier Cruz Nieto Pronatura Noroeste A.C. Calle 5ta. entre Félix U. Gómez y Jesús Urueta Col. Centro Ciudad Madera, Chihuahua, C.P. 31943 jcruz@pronatura-noroeste.org jcruzpictus@gmail.com</p> <p>Miguel Ángel Cruz Nieto Director, Programa de Conservación de Aves Pronatura Noroeste A.C. Sierra Rumorosa 132 Mazatlán, Sinaloa CP. 82,110 mama@pronatura-noroeste.org</p>	<p>Input from Javier, with assistance from Miguel Ángel, was provided throughout the recovery planning process (2011 through 2013). They answered many questions from AGFD and USFWS regarding parrot biology, known and suspected parrot sites, current rangewide habitat conditions, parrot use of mature conifers, habitat characteristics of nesting and roosting sites, geographic extent of rangewide breeding and wintering surveys and habitat, recovery action costs, downlisting criteria, actions needed, ongoing threats, impacts of fire, causes of habitat degradation, past translocations, habitat conservation schemes, naturalprotected areas, etc. They provided maps and biological reports, information on known or suspected parrot sites, updated population counts and nesting success.</p>	<p>We incorporated much of the information provided by Javier and Miguel Angel in the recovery plan addendum, which we believe has contributed toward a more comprehensive and accurate portrayal of the status of TBPAs, parrot biology, habitat conditions, past and ongoing threats, ongoing conservation, recovery costs, and recovery actions in Mexico.</p>

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Citlali Cortés Montaña Ernesto Enkerlin	Citlali Cortes Montano Instituto Tecnológico y de Estudios Superiores de Monterrey (ITESM) Ave. Eugenio Garza Sada 2501 Sur, Col. Tecnológico C.P. 64849, Monterrey, Nuevo León, México taxodium@gmail.com Dr. Ernesto Christian Enkerlin Hoeflich Profesor Investigador Instituto Tecnológico y de Estudios Superiores de Monterrey (ITESM) Ave. Eugenio Garza Sada 2501 Sur, Col. Tecnológico C.P. 64849, Monterrey, Nuevo León, México enkerlin@itesm.mx	Citlali Cortés-Montaña (CCM) and Ernesto Enkerlin-Hoeflich (EEH) comments : Comments by CCM 1. At times I got lost in a narrative that easily shifted from local to bi-national scales and focus of proposed activities. While this is a solid draft of the document, I think that it would benefit from a streamlining process that allows the authors to accurately identify threats at different scales, and to determine appropriate actions to reduce or eliminate them. 2. Since my expertise includes forest management and ecology, and old-growth habitat in the Sierra Madre Occidental, my reviews are centered on these themes. The Mexican PACE was published in 2009, and thus some of the information that it presents is outdated. I was a reviewer of the 2009 document, and back then there was little information available about specific characteristics of high-altitude (>2000 masl) old-growth forests, which are considered prime TBP breeding and nesting habitat. Since then I finished and defended my dissertation (Cortés Montaña 2011), which provides key information regarding old-growth structure, composition, age, and fire dynamics in forests at one of the prime TBP breeding and nesting sites in Mesa de las Guacamayas, Chihuahua. While I understand that the reviewed document is based on the Mexican PACE, it would be worth to include some of the updated information that can be found in my dissertation and associated peer-reviewed publications (e.g. Fulé et al. 2012, Cortés Montaña et al. in review). [Cortés Montaña, C. 2011. The treasure of the Sierra Madre: Ecology of old-growth forests in Chihuahua, México. Northern Arizona University, Flagstaff, Arizona. Fulé, P. Z., L. L. Yocom, C. Cortés Montaña, D. A. Falk, J. Cerano Paredes, and J. Villanueva Díaz. 2012. Testing a pyroclimatic hypothesis on the México-U.S. border. Ecology 93:1830-1840. Cortés Montaña, C., P. Z. Fulé, D. A. Falk, J. Villanueva-Díaz, and L. L. Yocom. in review. Linking old-growth forest composition and structure to fire history and climate in northern	1. We agree with the comments and grouped the forest issues into local and bi-national scales. We rearranged threats at different scales, and to determined appropriate actions to reduce or eliminate them. 2. We updated information found in Fulé et al. (2012) and Cortés Montaña et al. (in review). 3. We agree that convening an expert meeting to discuss recovery would be beneficial. Such a meeting may be initiated by any interested party with a contribution toward recovery. 4. We agree that a regional assessment of TBP potential habitat throughout its known range is needed and recommend developing a model that incorporates remotely sensed imagery, forest inventory information, and ground-truthing. This is included in the Recovery Criteria. Forest management plans are likely to be approved and in effect for most of the parrot's range in the SMOc. We added that foresters throughout the SMOc must also adapt the existing plans to exclude old-growth habitat from logging to achieve biodiversity conservation goals in actively managed forests. We clarified old-growth estimates in the recovery plan addendum. 5. We clarified Lammertink's estimates as follows: Lammertink et al.'s (1996) estimate of < 1% old-growth habitat remaining in the Sierra Madre Occidental, is based on contour lines (>2000 masl) to estimate the historical cover of old-growth temperate forest habitat. Thus, the estimate is not actually based on structure data and assumes that all forests found at or above that altitude were old-growth. The lack of "old-growth" definitions for temperate forests in the Sierra Madre Occidental poses another problem to assertions about the extent of its cover. Perhaps a more useful approach is that of Sánchez Colón et al. (2009), which differentiates primary from secondary forest; between the 1970s and 2002, México's temperate forest

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<p>Citlali Cortés Montaña Ernesto Enkerlin (continued)</p>		<p>México. Ecosphere.]</p> <p>3. I think that an activity that could easily be included in this plan would be to convene an expert meeting to provide feedback to update and strengthen both the PACE and the US Recovery Plan. from secondary forest. This group found that between the 1970s and 2002, México's temperate forest cover decreased by 25% and became increasingly fragmented, mostly due to agricultural clearing.</p> <p>6. Fire ecology and management I am glad that the document explicitly addresses fire management throughout. However, I think that a few points require clarification. Fire regimes are defined by multiple factors—I once heard a fire ecologist define them through an analogy to the Hutchison “hyper-niche” concept, where the niche is a hyper-volume that incorporates n-dimensions (as many as there are environmental factors)—and thus are a harder construct to make or understand. I think that in most instances, when the authors in the reviewed document use the words “regimes,” they mean historical fire frequencies (pp. 22). Another issue that merits clarification is the wording choice of fire management vs. integrated fire management. The PACE document states that “integrated” fire management practices should be developed and implemented, which may be why this concept found its way into the US Recovery Plan. The term “integrated fire management” is redundant when fire ecology concepts are part of fire management plans or prescriptions (Jardel 2010). I am probably at least partially responsible for the use of “integrated fire management” in the PACE, since I used that wording when I reviewed the plan in 2008. The term “catastrophic fire” should be replaced with “high-severity fire” throughout the document. “Catastrophic” is a subjective qualifier, heavy on the human interpretation of fire in landscapes, while “high-severity” is an objective reference to the impact of fire.</p>	<p>decreased by 25% and became increasingly fragmented, mostly due to agricultural clearing.</p> <p>6. We have made the recommended wording changes for historical fire frequencies, fire management, and high-intensity fire.</p> <p>7. Per Recovery Plan Standards, the order of the sections cannot be changed. Therefore, Section 2.6 (page 40 and on) cannot be placed after Section 3 (page 44 and on). Activities in these sections come directly from the PACE, except where noted, and we tried to retain the original intent in the English translation. The need to develop a series of baselines are included in the Recovery Criteria and Actions Needed sections.</p> <p>8. We have incorporated additional suggestions by EEH into the Recovery Criteria and Actions Needed sections where appropriate. We envision more quantitative measures will be determined as additional information becomes available.</p> <p>9. We changed language in the Recovery Criteria from “preserve and restore” to “conserve (protect, manage, and restore).” We changed “protection plan” to “conservation plan.”</p> <p>10. We agree that it is risky to assume that known or “traditional” breeding or wintering areas are the best or the ones on which measures should be “forcibly” implemented. We changed the Recovery Criteria language accordingly and in the Justification for the Recovery Criterion we include known sites as among those sites to be considered for conservation.</p> <p>We agree that parrots from a breeding population may not be migrating to the same wintering site and that we should be seeking new information. However, determining where the winter ranges exist for known breeding populations is important in understanding and conserving thick-billed parrot movement and</p>

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<p>Citlali Cortés Montaña Ernesto Enkerlin (continued)</p>		<p>7. Threat tracking and recovery program Section 2.6 (page 40 and on) seemed to be out of order, it made more sense once I read Section 3 (page 44 and on). I recommend to consider reversing the order of these sections in the document. Also, both sections list several vague activities (e.g. “Develop relevant GIS layers”), which would make them difficult to track and follow-up as the recovery plan is carried out. In general, seems that the activities need to be revised. The way the sections read now fluctuates between very specific activities (e.g. “broadcast radio spots”) to very broad and thus unclear ones (e.g. “develop relevant GIS layers” or “develop watershed management plans”). Lastly, the section needs to incorporate the need to develop a series of baselines: current and potential habitat, fire risk analyses, etc.</p> <p>Comments by EEH follow excerpts from the Recovery Plan addendum</p> <p>8. “a) Using a statistically sound and peer reviewed monitoring protocol, at least 15 years of systematic surveys document a stable or increasing trend in at least 5 known wild thick-billed breeding populations including Mesa de las Guacamayas, Madera, Tutuaca, Papigochic, and Campo Verde. Minimum viable population size and number of breeding colonies are to be established through research and modeling, including better understanding of non-reproductive groups.” A metapopulation approach needs to be incorporated at 6-10 sites as the basis for evaluation. Otherwise the criteria would likely be impossible to fulfill and therefore would not be useful. Additionally if the trend would be “increasing” possibly 10 years would suffice whereas if “stable” 15 years would be more appropriate.</p> <p>9. Replace "preserve and restore" with "conserve (protect, manage and restore)." Replace "parrot habitat protection plan " with "parrot habitat conservation plan".</p>	<p>habitat needs, respectively. At the same time, we acknowledge that we should be assessing wintering range for the species. We have reworded this Threats-based Recovery Criterion to: "The wintering range for at least five breeding populations is verified and mapped, and wintering areas are conserved for the foreseeable future through protected status designation, Units for the Management and Wildlife Conservation (UMAs), voluntary landowner cooperatives, land purchase, long-term conservation easements, acquisition of lumbering rights, or other mechanisms.(Factors A, D, E)."</p> <p>11. We deleted Threats-based Recovery Criterion 5. We included the following Action Needed: "Assess the potential for the U.S. to support naturally dispersing or actively relocated thick-billed parrots, including a review of U.S. historical habitat, current habitat management, and habitat connectivity with Mexico. Include the need and efficacy of translocating parrots in the assessment, and implement translocations if supported by Mexico and considered appropriate in the assessment."</p> <p>12. As recommended, we provide additional wording to include support of actions toward delisting and binational cooperation and funding.</p> <p>13. We agree that in several places in the document the term “protection” should be replaced by “conservation” as it includes management and restoration in addition to the protection component which frequently is not sufficient. We have made this change.</p> <p>14. We changed the order of the three “legs” of conservation in the document to “protected, managed, and restored” to reflect the order of intensity.</p> <p>15. We agree that appropriate/robust baseline population estimates are needed and have included this need in the Recovery Criteria. On-the-ground surveys of previously unsurveyed or infrequently surveyed are needed.</p>

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<p>Citlali Cortés Montaña Ernesto Enkerlin (continued)</p>		<p>10. The document emphasizes several times focus on known or “traditional” breeding areas from past scientific work. It is risky to assume that these are the best or the ones on which measures should be “forcibly” implemented. It would be safer to soften the language to “such as” Mesa de las Guacamayas, Madera, Tutuaca, Papigochic, and Campo Verde.</p> <p>“Wintering ranges for at least the five breeding populations including Mesa de las Guacamayas, Madera, Tutuaca, Papigochic, and Campo Verde are verified and mapped, and conservation needs assessed. (Factors A, D, E).”</p> <p>Again an overemphasis on existing information and even the assumption that different breeding “populations” somehow differ in wintering range. Assessment of wintering range should not be tied to specific breeding areas.</p> <p>11. “5) The potential for the U.S. to support naturally dispersing or actively relocated thick-billed parrots is assessed, including a review of U.S. historical habitat, current habitat management, and habitat connectivity with Mexico. The need and efficacy of translocating parrots are included in the assessment. (Factors A, C, E).”</p> <p>This has been done in the past and at any rate what is needed is to evaluate the need and efficacy and based on that start working on augmenting potential wild donor populations.</p>	<p>16. We added: "In addition to the establishment of natural areas at the federal (or state) level, other habitat conservation mechanisms exist such as Wildlife Management and Use Units (UMAs), voluntary landowner cooperatives (Ejido/Private preserves), land purchase, long-term conservation easements, Payment for Environmental Services (PES), and acquisition of lumbering rights (Pronatura 2010)."</p>

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<p>Citlali Cortés Montaña Ernesto Enkerlin (continued)</p>		<p>12. “Delisting” Due to the reasons outlined in the draft, I fully support not providing any “delisting” criteria. At the same time this should not be cause to not devote efforts in that direction. Therefore wording should include support of actions to that end and binational cooperation/funding to achieve.</p> <p>13. “thick-billed parrot habitat conservation protection plan” In several places in the document the term protection should be replaced by conservation as it includes management and restoration in addition to the protection component which frequently is not sufficient</p> <p>14. “are effectively protected, restored, and managed.” This is a very appropriate way to include the three “legs” of conservation yet it would be more appropriate to list the in order of intensity: protected, managed and restored.</p> <p>15. “Population Estimates” Although in the last 20 years much work has gone into natural history and conservation of the Thick-billed Parrot (including much in which I was personally involved in the 1990s), appropriate/robust population estimate has NEVER been conducted. This is imperative as a baseline information and should receive an extremely high priority to be conducted as soon as possible and definitely within the next two years. My sense from personal experience and field data is that the population in above 5,000 and likely even in the order of 10,000 but it is extremely important that such is adequately assessed very soon.</p>	
		<p>16. “federal Protected Areas of Flora and Fauna or” More correctly Flora and Fauna Protected Areas the closest category in the US being “Wildlife Refuge”. It should be noted that being an endangered species the desirability for federal designation is high but the feasibility especially in effectively and quickly protecting small nesting aggregations or areas of prime habitat can be similarly be served by other means including community conserved areas or state/municipal protected/conserved areas. general and page specific comments; including marked up recovery plan in track changes</p>	

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Tiberio Monterrubio	Universidad Michoacana de San Nicolas de Hidalgo, Edificio "R". Ciudad Universitaria, Av. Fco. J. Múgica s/n. Col. Felicitas del Río, Morelia, Michoacán, C. P. 58030, México tiberio@umich.mx tiberio@zeus.umich.mx	His comments were sent to us as edits in the draft addendum. He provided edits for 3 areas of concern: 1) The northern and southern periphery of breeding and wintering range should be included as part of the thick-billed parrot's range, especially where little information is known. We need to plan for expansion or shifting into these peripheral areas, especially in the context of climate change. 2) Surveys are needed in high elevation forests in Durango, where few or surveys have been conducted. Parrots have been documented in Durango during the breeding and non-breeding season. 3) Translocations and reintroductions into extirpated sites or newly emerging suitable habitat may be needed. He also provided updated fire information.	We included the need to plan for expansion or population shifts into the northern and southern periphery of the breeding and wintering range, especially in the context of climate change. We included the need for surveys in high elevation forests in Durango, where few or surveys have been conducted. We included support for translocations within Mexico where unoccupied suitable habitat exists. We explain limitations to reintroductions. We also included updated fire information.

Commenter	Affiliation	Comment	Response
Susan Healy and Joe Barkowski	<p>Susan Healy, Species Coordinator, Thick-billed Parrot Management Group, Assoc. of Zoos and Aquariums, Sacramento Zoo, 3930 West Land Park Drive, Sacramento, CA 95822 shealy@saczoo.org</p> <p>Joe Barkowski - Tulso Zoo. Cochair of Thick-billed Parrot Management Group Tulsa Zoo and Living Museum 6421 East 36th Street North Tulsa, OK 74115 jcbksi@aol.com</p>	<p>The following input was received through discussion and email.</p> <ol style="list-style-type: none"> 1. In the mid-1990s, the Thick-billed Parrot Species Survival Plan (SSP) Management Group, part of the Association of Zoos and Aquariums, redefined its goals to de-emphasize the release of captive birds, address the problems discovered in the early releases, and to increase SSP support of free-living populations. The goal of the Thick-billed Parrot SSP is to ensure the survival of the thick-billed parrot within its historical range by maintaining a captive population, educating the public regarding the conservation of native endangered species, and supporting the wild populations and their habitat within North America (Lamberski and Healy 2002). The captive population is important for enhancing knowledge of thick-billed parrot biology, serving as representatives to educate the public about this species, and creating a refugium for conservation options. The focus of this group has changed from actively breeding TBPA's for reintroduction in the late 1980s to early 1990s to using TBPA's in zoos as ambassadors for recovery for this species. The Thick-billed Parrot Species Survival Plan (SSP) Management Group is also developing better disease diagnostic testing. The AZA has funded thick-billed parrot field research in Mexico to contribute toward recovery and hopes to continue in this role. 2. Thick-billed parrots are not a good candidate for release of captive bred birds. Those who have not worked with thick-billed parrots for years and know their biology and behavior are probably unaware of why they do not make good candidates for captive-bred releases. 3. Thick-billed parrots do not reproduce every year. They don't lay as many eggs as macaws or amazon parrots. They breed at 5 years or older in captivity. There are less than 100 birds in captivity in zoos and probably even fewer in private hands, even in other countries. It would take 15-20 years to double the population in captivity. It would take 50 years to build up enough birds to release. 	<p>We included much of this information in the recovery plan addendum.</p>

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Susan Healy and Joe Barkowski (continued)		<p>4. Young of this species continue to learn from parents long after fledging and some survival skills cannot be learned in captivity.</p> <p>5. Captive-breeding is expensive. Zoos have competing needs for limited funding. The Thick-billed Parrot Species Survival Plan (SSP) Management Group moves birds to different facilities to ensure genetic diversity is maintained.</p> <p>6. Disease is their biggest concern for translocations. There is also concern that if parrots are translocated to the Chiricahua Mountains they would fly back to their source site.</p> <p>7. The Thick-billed Parrot Species Survival Plan (SSP) Management Group leads agree with the direction in the recovery plan addendum.</p>	

Commenter	Affiliation	Comment	Response
<p>Nadine Lamberski, DVM, Dipl. ACZM</p>	<p>Associate Director, Veterinary Services San Diego Zoo Safari Park 15500 San Pasqual Valley Road Escondido, CA 92027-7017 nlamberski@sandiegozoo.org 760/ 291-5406 p. 760 291 5406 f. 760 747 3168</p>	<p>The impact of disease will be intensified as populations decline, become fragmented, or are stressed due to other factors such as reduced food availability and habitat disturbances. Collecting information in advance and not waiting for a catastrophic event to happen will allow for science-based decision making and planning during the recovery effort.</p> <p>Nadine's emails for page-specific suggestions on incorporating disease monitoring into different parts of the recovery plan in wild and captive populations: No information on the role of disease in population declines. Proposed translocation within Mexico and from Mexico into US to bolster existing populations and create a safety-net population outside the Sierra Madres. This conservation action seeks to build a larger and more widely distributed metapopulation which may prove vital to the species survival and gained support of Trilateral Committee for Wildlife and Ecosystems Conservation Measurement in 2006. Project initiates health assessments and serosurveys of chicks, mosquito trapping at parrot nest sites, as well as pathogen prevalence studies that aim to investigate the role of disease in population decline and improve the success of conservation actions proposed to augment these populations. This project is part of a larger conservation initiative that integrates health and genetic studies with existing ecological studies for the common purpose of preserving parrot populations and critical habitat (Lamberski et al. 2010). Very little is known about the disease impacts; however, disease is a natural part of all biological systems. The impact of disease will be intensified as populations decline, become fragmented, or are stressed due to other factors such as reduced food availability and habitat disturbances. Collecting information in advance and not waiting for a catastrophic event to happen will allow for science-based decision making and planning during the recovery effort.</p>	<p>We have corrected errors noted in the review comments. We included updated information on diseases relevant to wild and captive thick-billed parrots. Comments were very thorough on many aspects of disease in thick-billed parrots and declining populations and included additional disease publications. Some of the information we received was informative, although it contained more detail than what is needed in the recovery plan. We summarized the most important points for thick-billed parrot recovery.</p>

Commenter	Affiliation	Comment	Response
<p>Nadine Lamberski, DVM, Dipl. ACZM (continued)</p>		<p>Executive Summary Habitat Requirements, Threats, and Other Limiting Factors p. 2, paragraph 3 in this section: Climate change may also threaten parrots by altering vector prevalence and exposing parrots to novel diseases. A</p> <p>Recovery Strategy p. 2 paragraph 1 in this section: The captive thick-billed parrot population in AZA-accredited facilities can be used as a resource for TBPA disease susceptibility, management, and prevention. D</p> <p>Recovery Criteria p. 3, paragraph 1 in this section: Research is also needed on the health and nutritional status of wild populations as this can affect fecundity and fertility. Diseases that are important to monitor are those with regulatory importance (avian influenza, Exotic Newcastle Disease), those that arise due to human development (toxicities due to pesticide or heavy metal exposure), those linked to exposure to domestic animals (Salmonellosis), those that may be transmissible among nesting areas (such as ectoparasites), and emerging diseases (West Nile Virus [WNV]).</p> <p>Demographic Criteria p. 3, paragraph 1): An additional threat is human encroachment in the Sierra Madres. This is minimal at this time, but some diseases (such as WNV and exposure to environmental toxins) are linked to habitats with human disturbance.</p> <p>Threats-based Criteria (as related to the five listing factors addressed in section 1.7 on page 22 and section 2.4 on page 35) p. 5, can add: 8) Measures to monitor health, the impact of disease, and mitigate disease risks. Goal is to prevent catastrophic disease outbreaks.</p>	

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<p>Nadine Lamberski, DVM, Dipl. ACZM (continued)</p>		<p>Actions Needed E = Other natural or manmade factors</p> <p>p. 7, paragraph 1: Parrot monitoring protocol should include health assessment and sample collection for disease monitoring. It is important to evaluate each nesting area as some infections (such as ectoparasites) may be site specific and to monitor the sites over subsequent years. A standard protocol would allow for consistency in data collection. Protocols can also be written to include noninvasive sample collection and to only handle birds in conjunction with other research efforts.</p> <p>1.1.2. Recovery Priority Number p. 16, paragraph 1: There is very little information available on the health factors that may be associated with population declines or that may have a greater impact on declining populations. There is little information available on how landscape changes can alter disease exposure.</p> <p>1.6 Abundance and Trends The data presented supports the concern that TBPA populations are declining. The small number of reported breeding pairs is very concerning but is consistent with zoo populations. Although not likely, there may be other factors playing a role such as micronutrient deficiency, underlying disease, and exposure to environmental toxins. In addition to knowing what percent of pairs produce eggs, it would be helpful to know fertility rates, hatching success, and fledgling success. Having protocols and procedures in place prior to a mortality event would maximize the amount of information obtained from these rare events in remote locations. More of an effort should be made in this regard. Additionally, prospective sampling may be useful in ruling out disease-related infertility as well as causes of morbidity and mortality. Egg shells, feathers, feces, and possibly nesting material could be used to obtain diagnostic information noninvasively.</p>	

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<p>Nadine Lamberski, DVM, Dipl. ACZM (continued)</p>		<p>1.6. Abundance and Trends Breeding Population p. 22, end of first paragraph: Causes of infertility could be related to health factors such as nutrition, environmental toxins/pesticides, parasite burdens, infectious and noninfectious diseases.</p> <p>1.7 Threats Since my area of expertise is in wild animal health and disease, my comments are focused around this topic. There are two emerging threats to parrot habitat that are overlooked in this plan. One is emerging diseases (and in particular vector borne diseases) and the second is habitat degradation due to human impacts. West Nile Virus (WNV) activity is concentrated in areas of human development due to the disturbances that lead to an increase in mosquito breeding areas. The above can be addressed by monitoring populations and mosquito pools for emerging diseases and educating the communities in the Sierra Madres on how there actions can negatively impact parrot (and their own) health. If WNV becomes a real threat, a vaccination strategy can be developed until the virus becomes endemic and natural immunity exists in the population.</p>	

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<p>Nadine Lamberski, DVM, Dipl. ACZM (continued)</p>		<p>1.7 Threats Factor C. Disease and Predation Disease p. 25, paragraph 1-2 in this section: The information for Lamberski, personal communication, is incorrect. The correct information is: in 2008, samples were collected from 4 adult and 9 TBPA chicks. Biological samples were exported for diagnostic tests. Results were negative for the following: avian polyomavirus serology (n=8), avian polyomavirus PCR (n=8), Pacheco's disease serology (n=5), Pacheco's disease PCR (n=5), Chlamydothila spp. PCR (n=8), Salmonella PCR (n=13), SLE serology (n=12), WNV serology (n=12), avian influenza AGID (n=12), and Exotic Newcastle Disease (n=12). In 2009, samples were collected from 29 chicks from 3 nest sites. All checks were negative for St. Louis Encephalitis Virus (SLE) and WNV. Additional samples were stored at the CIIDIR-IPN Laboratory in Sinaloa for future export and analysis. Unfortunately, the government closed down the lab and we have not been able to locate the samples. Much is known about the disease affecting thick-billed parrots in captivity and this information can be obtained through the SSP Veterinary Advisor.</p> <p>Predation p. 26, paragraph 2 in this section: The data is too limited to draw any conclusions about the impact of disease. Disease can have devastating impacts on small populations and can contribute to infertility. The presence/absence of disease at the different nests sites is not known and may differ at the different locations. This becomes increasingly important if adaptive management measures include moving eggs, chicks, or adults from one nest site to another.</p>	

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<p>Nadine Lamberski, DVM, Dipl. ACZM (continued)</p>		<p>Climate Change</p> <p>p. 29, paragraph 5 and p. 30 paragraph 8-10 in this section: Can consider monitoring for vector-borne disease as these may increase with changes in microclimate. Vaccination strategies against WNV have been very successful in zoos and in free-living California condors. Human disturbances have been linked to WNV. For example, trash, spare tires, and open fence posts can lead to increased mosquito breeding areas.</p> <p>Climate change and small increases in microclimate temperatures may have a negative impact on TBPA populations. A lengthy rationale is provided:</p> <ul style="list-style-type: none"> • TBPA breed at elevations >2000m (6500ft) June-Sept which coincides with the rainy season. • TBPA are extremely susceptible to WNV. 33% of deaths in all TBPA in AZA-facilities in the US in 2003-2004 were due to WNV. • WNV, which has been detected in almost every state in Mexico, has not had the same impact on humans, horses, or birds as it has in the US. One possible explanation is that antibodies from prior exposure to viruses in the same family (such as Dengue Fever or SLE) may offer cross protection against WNV. • Viral replication in mosquitoes is temperature dependent and therefore animals at higher elevations may not be exposed due to cooler ambient temperatures. • If not exposed to WNV, probably not exposed to other viruses that could protect them. • Habitat degradation (esp. due to human impacts) may provide favorable habitat for mosquitoes. • Increases in microclimate temperatures may allow for WNV transmission. • Introduction of WNV into the Sierra Madres could devastate wild parrot populations. • No current evidence of WNV/SLE activity but mosquito vectors present. • Potential exists for WNV to impact nesting populations. • In 2007, 13 birds from Madera were tested for WNV and SLE and all were negative. In 2009, 29 birds from 3 sites (Madera, Tutuaca, and San Juanito) 	

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<p>Nadine Lamberski, DVM, Dipl. ACZM (continued)</p>		<p>Nest Site Genus species Life Stage Number Elevation Mesa Culex spp. Larvae >100 1910m (6226ft) Madera Culex tarsalis Adults 42 2170m (7119ft) Tutuaca Culex quinquefasciatus Adults 4 2590m (8497ft)</p> <ul style="list-style-type: none"> • Using a mobile molecular diagnostic lab, we collected mosquito pools and tissues from a dead chick for real time PCR. • All mosquito pools were negative for flavivirus. • We were able to extract and amplify DNA from the dead chick. • Because we used group flavivirus PCR, we used the computer to generate dissociation curves to identify the drop in fluorescence. • The DNA we obtained was similar but distinct from WNV. • The significance of this flavivirus in the death of the chick is unknown but serves as an example of an emerging threat. 	

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<p>Nadine Lamberski, DVM, Dipl. ACZM (continued)</p>		<p>1.8. Conservation Measures 1.8.1. Reintroductions p. 31, paragraph 4-5 in this section: Pacheco’s disease is a host-adapted avian herpesvirus that is present in approx. 30% captive TBPA. The virus does not cause disease in TBPA but can be shed in the feces and cause death in other psittacine birds. Pacheco’s disease should not impact survival of TBPA. I have reviewed necropsy reports from captive TBPA from 1954 to the present and there have been no deaths due to this avian herpesvirus. Psittacine Proventricular Dilatation Disease (PDD) has been diagnosed in captive TBPA and can lead to death. Since there is not a pre-mortem test for PDD, there is no way to know that birds released into Arizona had this disease. It is an overstatement to suggest this contributed to poor survival. It is feasible and appropriate to consider reintroducing parrots into historical or potential habitat but not at the expense of the Mexican TBPA population. Health assessment and disease screening protocols need to be written and followed. Monitoring post release is essential. An in situ propagation center and soft release strategy could be considered. Much discussion is needed with experts from various disciplines including zoo personnel with expertise in captive propagation of TBPA. p. 31, paragraph 6: When considering birds as release candidates, also need to look at WNV serologic status. A bird with a high titer is considered protected. Birds with low or no titers should be vaccinated. The prevalence of WNV in Arizona is very high.</p>	

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<p>Nadine Lamberski, DVM, Dipl. ACZM (continued)</p>		<p>2.3. Recovery Objectives p. 33, #5: These guidelines should include health assessments and biological sample collection for disease monitoring. Alternative protocols should be written for the noninvasive collection of samples. Data from the different nest sites should be compared to see if differences in disease prevalence exist. p. 34, #7: Include littering, contamination of soil/water by environmental toxins, pesticides, waste (human and domestic animal). #9: Include research on diseases that may impact small populations. #10: Include parrot health and disease. #11: Include personal responsibility such as removing trash, reducing mosquito breeding areas, responsible use of pesticides and chemicals, etc.</p> <p>2.4 Recovery Criteria Downlisting Criteria Demographic Criteria p. 35, paragraph 2: Include data on nutritional condition, disease prevalence, mortality, and infertility.</p> <p>Delisting Criteria p. 39, paragraph 1: Include information on disease prevalence and causes of mortality. Since carcass recovery would be minimal, prospective health parameters and disease monitoring can provide valuable information. Need to be sure that diseases that result in morbidity (and not mortality) are also monitored as these conditions can affect overall fitness and fertility.</p>	

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<p>Nadine Lamberski, DVM, Dipl. ACZM (continued)</p>		<p>2.5. Actions Needed Factor E = other natural or manmade factors p. 40, paragraph 1: Parrot monitoring protocol should include opportunistic health assessments of chicks and adults plus sample collection. Sample collection protocols should include procedures for saving carcasses, feces, feathers, and eggs for diagnostic evaluation. Maintain a database for each nesting area to help identify trends. Measurable criteria will then be available to help reclassify the TBPA.</p> <p>2.6. Threats Tracking Table p. 40, Recovery Action 5.4: Monitor littering and habitat degradation due to human disturbance. Recovery Action 7.4: Monitor vector prevalence p. 42, Factor C: Disease should be listed as a threat to TBPA populations, esp. if population numbers decline or become fragmented. There has been no mortality survey conducted so the true impact of disease is unknown. It is not known if the disease risks differ at the various nest sites. It is not known if health factors (such as nutritional status), underlying disease, or exposure to environmental toxins contribute to infertility. It can be assumed that all the above will impact fitness and ultimately affect survival. p. 43, Recovery Action 14.4: Need to proactively monitor health and disease as it is unlikely that the majority of mortality events are recognized.</p> <p>3.1 Outline of Recovery Actions p. 45, #5, 1.2 and 1.3: Include health evaluation and disease screening protocols. p. 46, #9, 9.6: Includes developing a necropsy protocol, egg analysis protocol, health assessment protocol, biological sample collection protocol, and diagnostic testing protocol.</p>	

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<p>Nadine Lamberski, DVM, Dipl. ACZM (continued)</p>		<p>p. 47, #10, 10.1: Add health evaluations and sample collection to existing interventions to maximize information collected and minimize handling of birds.</p> <p>p. 48, #14, 14.5: Develop protocols as noted above. Also have protocols for noninvasive sample collection (such as feathers, feces and eggshells) so data can still be generated if birds are not handled.</p> <p>#16, 16.1: Include studies that support evaluating health and disease exposure.</p> <p>4.3 Implementation Schedule</p> <p>A health/disease database over a minimum of 10 years at 3-5 nesting areas is needed to provide information on population health using temporal and spatial scales. The cost of this will vary tremendously and more details are needed before an accurate estimate can be given. Based on previous experience, a small scale monitoring study can be done for approximately \$5000/year.</p>	

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Noel Snyder	P. O. Box 16426 Portal, Arizona 85632 nfsnyder@gmail.com	<p>1. Dependency on Old Growth Forests.</p> <p>Field studies of recent decades in Mexico have documented a generally strong relationship of population densities of the Thick-billed Parrot with the extent of old growth forests, a correlation that could be primarily a food supply effect or a nest availability effect, or both, as both conifer cone supplies and natural cavity nest sites tend to increase with maturity of forests. However, evidence from the large and productive thick-bill population near Madera, Chihuahua, which nests largely in cavities of old-growth aspens (but does not feed on aspens) and is surrounded by a food supply limited to pine forests under regular and substantial timber harvest (hardly old-growth forests) suggests that nest availability may be the most crucial characteristic of old-growth forests for the species. Similarly in some other areas in Chihuahua, thick-bills continue to hang on nesting in cavities of scattered mature Douglas Firs (which are not harvested), even though surrounding areas of pine are under regular timber harvest. These observations seem to indicate that the species is not completely dependent on old growth forests for food supplies and can survive in some areas subject to moderate timber harvest so long as nest sites continue to be available.</p> <p>Overall Relevance of Efforts to Reestablish Thick-billed Parrots in Arizona for Conservation of the Species</p> <p>Although reestablishment of the species in Arizona would surely be viewed as a positive step by nearly everyone, it is questionable to assert that it is essential for conservation of the species. Historical distribution records suggest that the Arizona portion of the species' early range may have been only a marginal component, and although it appears that Arizona populations were likely wiped out by shooting, it is not entirely clear that populations north of the border may be sustainable in the future especially because of the potentials for climate change to negatively affect habitat of</p>	<p>1. We agree with these comments and have included much of this information in the recovery plan addendum.</p> <p>2. Retention of released birds in the historical habitat of the Sky Islands in Arizona and New Mexico is a major concern. If birds leave the reintroduction area and head back to their sites of origin, funding and effort will have been needlessly expended. If birds leave the reintroduction area and head into non-historical habitat farther north, the risk of unintended consequences increases.</p> <p>3. We agree with the summary of recommendations for translocations with the caveat that translocations would only be attempted if habitat conditions suitable for release exist. As is pointed out by these comments, current habitat conditions in the Sky Islands are not favorable for translocations.</p>

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Noel Snyder (continued)		<p>the species (witness recent extensive fires in the region). Habitat changes may be especially severe in their effects north of the border primarily as a result of the declining diversity of conifer species and extent of conifer forests as one moves north from the Sierra Madres into the Sky Islands. With the erratic fruiting of many conifer species, forests capable of sustaining the species in the long term may necessarily have to include a wide diversity of conifer species in good numbers to buffer inevitable cone failures in individual species. Presumably conservation and recovery efforts for the Thick-billed Parrots should remain most heavily focused on the principal populations of the species in Mexico which presently enjoy the most extensive, diverse, and productive conifer forests (and incidentally forests that appear to be much less susceptible to fire damage than forests in the Sky Islands region because of differences in brush build-up in the two regions potentially resulting from regular deliberate fires of low intensity set in the Sierra Madres).</p> <p>Problems with attempting to reestablish Thick-billed Parrots in Arizona under continuing drought conditions</p> <p>With respect to reestablishing thick-bill populations in Arizona, I have sincere concerns about the potentials for success if long-term drought conditions do not end in the near future. Recent decades have brought us a persistent drought, which has led to numerous and tremendous fires which have resulted in substantial damage to the extent and maturity of the conifer forests of the Sky Islands. Widely perceived as a manifestation of global warming, these changes may plausibly be greatly reducing the viability of high elevation forested habitats for supporting Thick-billed Parrots, and it is well to question whether these are conditions under which reestablishment efforts should be initiated. Even without fires, the food supplies in the Sky Islands seem to be only marginal in reliability. In 1989, we witnessed a near total collapse of the cone crop in southern and central Arizona which apparently led to</p>	

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Noel Snyder (continued)		<p>dispersal of the nucleus of released birds which had established a home in the Chiricahuas and migrated annually to the Payson region. Conditions have not been truly favorable from a rainfall standpoint since that time. For example, the release conducted in late 1992 was limited to West Turkey Creek of the Chiricahuas because there were no good cone supplies in other canyons. But within a half year the birds consumed all the available cones visible in the West Turkey Creek release area and dispersed, first to high elevations where there was still a Douglas Fir cone crop, and then to unknown destinations (there were no other potential foods available in any abundance in these mountains in that year).</p> <p>Currently (2012), the summer monsoon in the Chiricahuas is again falling far short of normal expectations, and if trends continue we could see more fires rivaling the horrendous Rattlesnake and Horseshoe 1 and Horseshoe II fires of recent years. Most long-term weather predictions for the region suggest continued drought in the decades ahead, and it is hard to imagine that such weather effects might be without long-term detrimental effects on forest composition and structure, as these are already being seen, as well as detrimental effects upon cone supplies. These are conditions under which it may be very difficult to achieve success in reintroduction efforts. The Recovery Plan should clearly recognize that releases may not make sense unless current detrimental climatic trends in southern Arizona significantly ameliorate in the years ahead. Under environmental conditions typical of the 1960s and 1970s I would be fairly optimistic about chances of achieving a viable southern Arizona population, but not so under current conditions.</p>	

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Noel Snyder (continued)		<p>I don't know how such contingencies might best be handled in recovery plan documents, but suggest that they are of overriding importance. Sorts of Birds to be Used in Release Efforts in Arizona – Some Crucial Considerations</p> <p>If conditions ever do return to favorable for releases in southern Arizona, success may depend heavily on the specific release methods employed. Experimental releases of the species to the wild in the Chiricahua Mountains in the 1980s and 1990s, in which I was personally involved, strongly suggested a number of conclusions about the establishment potential of various sorts of birds. Most birds released were confiscated birds that had been smuggled into the US and that apparently had been netted as free-flying wild birds in Mexico. Releases were limited to individuals that had perfect or repairable flight feathers, and these birds proved to be fully competent birds from a behavioral standpoint. Still they exhibited continuing losses after release, mostly from hawk predation, and our initial conclusion was that they faced a high predation-risk environment in southern Arizona. However, in early releases we were not able to monitor released birds very closely because they exhibited frequent and unpredictable movements in an unforgiving terrain, so we missed seeing details of why and how birds were taken by predators, usually finding only the plucked remains of radioed birds after the fact.</p> <p>We learned much more about the details of predation in the last release conducted in late 1992 in West Turkey Creek of the Chiricahua Mountains. Here because of a geographically limited food supply and relatively gentle terrain, we were able to keep the flock in nearly constant view for half a year after release. And here we were finally able to document details of predation on the flock. Roughly half the released birds were lost to predation in the first few months after release. Predation was not random, however, and indeed in almost every case we were able to predict which bird would be taken by a hawk the day before it happened, because the</p>	

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Noel Snyder (continued)		<p>bird began to straggle from the flock. Presumably the hawks noticed this as well and quickly homed in on struggling isolated birds as practical victims. We finally were able to get to one such bird before the hawk had eaten more than a bite or two. We were also able to get the bird away from the hawk and to a pathologist for immediate necropsy. It was indeed a diseased bird (avian cholera). We strongly suspect that similar things were going on in earlier releases, but just were too difficult to document. What we had initially interpreted as problems with a high predation environment we now think are better interpreted as problems with releasing birds compromised by pathogens into an environment that may well have only normal predation risks.</p> <p>The lesson we believe should be drawn from this is that even though confiscated wild-caught birds were very good release birds from a behavioral standpoint, they were very questionable birds to release from a disease standpoint because they had unknown histories of exposure to disease while they were in captivity. Birds were screened for some diseases before they came into our release program, and with very few exceptions appeared outwardly healthy as captives. But many diseases cannot be detected in carriers, and upon experiencing the stress of release, birds carrying such pathogens were evidently breaking with disease with substantial frequency. This effect posed risks both for releases and for wild birds of other species that may have come into close contact with released birds. We no longer think it is acceptable to use such birds in release efforts.</p> <p>Releases of captive-reared birds posed difficulties of other sorts. In contrast to the results with confiscated wild-caught birds, these releases were troubled by tremendous difficulties in getting normal behavior. Birds with sub par behavior usually survived only briefly in the wild. Captive-reared birds in general showed little tendency to flock properly, had difficulties recognizing and remaining in appropriate habitat, fed poorly, and usually perished very quickly either from food stress or predation. Training captive-reared birds even to feed competently on pine cones was a</p>	

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Noel Snyder (continued)		<p>laborious process taking many months before release and even though they were caged with wild-caught birds prior to release, the only birds that showed any tendency to flock with wild-caught birds were ones that had been parent-reared in huge aviaries. Even so, the hawks quickly and selectively picked captive-reared birds out of mixed release flocks that included both wild-caught and captive-reared birds. Considering the huge expense and trouble in producing captive-bred birds with even modest behavioral competence, we think the approach of trying to achieve surviving flocks from captive-bred birds is inadvisable. Moreover it is unnecessary when better alternatives are available. It is also important to point out that some of the birds coming into the program from captive breeding facilities in the 1980s and 1990s proved to be birds carrying serious diseases. Few captive breeding facilities practice the rigorous sorts of procedures necessary to prevent such risks.</p> <p>For potential future releases, the above considerations lead to a conclusion that survival of released birds may be maximized, risks minimized, and expense minimized by focusing on translocations of free-flying, wild-caught birds from one area to another – basically the same strategy that has evolved for establishing new populations of Wild Turkeys (where successful release of captive-reared birds has also been very difficult). Birds destined for translocation/releases should be (1) intensively screened for known pathogens and should (2) never be put in proximity to other birds in typical captive environments because of disease risks, though they will have to be held captive in isolation for at least short periods of time.</p> <p>2. Nevertheless, even if releases are not troubled by disease, drought, or other unfavorable environmental conditions, translocations of wild-caught birds still pose uncertainties that may take well-designed research to overcome. Results of releases in the 1980s and 1990s indicated variable tendencies of such birds to remain in release areas and establish new populations in these areas or nearby, and the factors affecting such tendencies are not yet fully understood.</p>	

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Noel Snyder (continued)		<p>One factor that may be very important is the established seasonal movement patterns of source populations, as birds from migratory populations may well repeat such patterns in release areas. Patterns of seasonal movements of various populations in Mexico are known only very imperfectly, and if a population could be confirmed that is highly sedentary, such a population might be especially valuable for translocations as it may have little tendency to abandon release areas. But assuming all potential source populations found prove to have migratory habits, as some surely do, the length of time such birds are held in captivity may turn out to be a critical factor in whether they attempt to “home” back to Mexico. Conceivably, chances for avoiding such homing behavior might be maximized by holding birds in captivity for substantial periods before release. Also the time of year that releases are conducted may be very important. Thus the chances of birds released in Arizona staying in Arizona, rather than returning to Mexico, may be maximized by winter releases, as the next migration period in late spring will likely take them north rather than south. Birds flying back to Mexico and encountering other thick-bill populations are probably a poor bet for return to Arizona because of strong social tendencies of the species.</p> <p>In any event, results with the releases of the 1980s and 1990s indicated that at least some wild-caught birds will adopt new homelands after periods in captivity. One suspects that the tendencies to “home” may be strongest in breeders trapped at nests and released relatively soon after capture, and for this reason alone, it may well be best to trap nonbreeders for translocation efforts if they can be identified as such. During the breeding season, successful breeders remain attached to nest sites in their roosting behavior, so birds trapped at communal roosts during this season will presumably be at least largely nonbreeders. Translocations of nonbreeders are also presumably the best strategy from the standpoint of keeping impacts on source populations to a minimum. The underlying assumption here is that nonbreeders will readily become breeders under proper environmental conditions. Many of them are nonbreeders simply</p>	

Commenter	Affiliation	Comment	Response
Noel Snyder (continued)		<p>because they are not yet old enough to breed.</p> <p>Once a release flock is established in a favorable area, it can be bolstered in numbers by repeated direct hard releases of single wild-caught birds into the flock. Releases of the 1980s and 1990s revealed that single birds had no tendency to abandon flocks into which they were introduced, while introductions of larger numbers of birds into release flocks sometimes resulted in the newly released birds dispersing as a separate flock.</p> <p>3. In summary, results of the 1980s and 1990s suggest strongly that releases should be limited to:</p> <p>1. birds that can be reliably identified as low risk from a disease standpoint. Birds from confiscations and multispecies zoo and aviculture environments should not be considered as candidates, while direct translocations, wild to captivity to wild, are a promising way to go so long as temporary captive environments are very carefully protected from exposure to all disease sources. Intrinsic to this approach is quarantine of captured birds in special isolated facilities different from standard quarantine of birds coming in from Mexico.</p> <p>2. birds with extensive prior experience coping with wild existence. By far the best birds for release from a survival standpoint are experienced free-flying birds that are captured from the wild in Mexico. Using such birds is also presumably far cheaper than the captive-breeding approach, which should not be considered a promising approach for this species on behavioral grounds alone. Although the species breeds quite readily in captivity, even parent-reared individuals raised in huge cages and integrated with wild-reared experienced birds have demonstrated poor survival after release. Evidently birds under care of their parents in the wild learn survival skills that are very difficult to duplicate in captivity. The period of fledgling dependency on adults in the wild extends many months beyond fledging.</p>	

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		<p>3. birds from source populations large enough to donate some individuals without themselves being threatened by the process. Marginally viable populations should not become source populations for such efforts, and so far as is possible, translocations should be limited to nonbreeding birds to protect the viability of source populations.</p> <p>I hope the above comments and recommendations may prove to have some value in revisions and improvements to planning concerned with conservation of the Thick-billed Parrot. The things that were learned during experimental releases of the species in the 1980s and 1990s should be carefully considered to avoid repetition of past errors in the future.</p>	

Commenter	Affiliation	Comment	Response
Sartor O. Williams III	Southwest Natural History Institute 1819 Meadowview Drive NW Albuquerque, New Mexico 87104 sunbittern@earthlink.net	<p>General Comments:</p> <p>It is clear that the TBPA is a critically endangered species, and this is recognized and emphasized in both the Mexican plan and the addendum. It is also clear that the entire population of this species resides in Mexico, and it follows that any useful recovery actions must be focused on, and occur in, that country.</p> <p>Below, I provide a number of comments by page and paragraph. Through it all, I bring attention to the uncertain historical status of the TBPA in the U.S. This is not meant as criticism of any particular biologists, but rather a reminder that there are different points of view that may be equally valid, especially the long-held understanding that the TBPAs that occurred in the U.S. represented incursions of birds from known breeding populations in Mexico. The alternative view, and the one adopted by the addendum, is that although no nests or nesting birds were ever documented, the birds nevertheless were likely nesting but had been overlooked. That argument may seem to some as pure sophistry, but whatever the case, it cannot be proved one way or the other. That there is no direct evidence that the species ever nested in the U.S. should be given greater prominence.</p> <p>Finally, I will add that I have been involved with ESA recovery planning since the mid-1970s (beginning with the Mexican Duck) and continued to be involved with such work through the mid-2000s (Southwestern Willow Flycatcher, Mexican Spotted Owl), and am familiar with the often-convoluted planning process. In addition, I have lived in Mexico for considerable periods, conducting surveys for and/or research on endangered and other bird species, and am well aware of the challenges facing Mexican biologists as they seek to conserve the TBPA. U.S. agencies and other interested parties should recognize the lead role in this effort is properly with Mexicans, in Mexico, and strive to avoid initiating programs in the U.S. that may become a distraction to the real mission at hand, i.e.,</p>	<p>We agree that the historical status of the thick-billed parrot in the U.S. is uncertain and that we do not have direct evidence that thick-billed parrots ever bred in the U.S. We tried to present both points of view and prepared the recovery plan addendum from the perspective that some thick-billed parrots may have bred in the U.S. until the early 1900s in some years. Including the questionable historical U.S. thick-billed parrot breeding habitat for consideration in the recovery planning process ensures we are not erroneously excluding breeding habitat that may have once been used by parrots.</p> <p>We included some additional information on historical information to make it clear that there are no confirmed nesting records. We can only conclude that some TBPAs may have bred in the U.S. in some years, but large flocks likely occurred infrequently. We reworded parrot presence in the U.S. to avoid use of word "extirpated."</p> <p>We reworded the 1964 Animas Mountains documentation to "there is also an unconfirmed 1964 report of a flock seen in New Mexico's Animas Mountains (Woodward 1980 in Snyder et al. 1999, Williams 2007, 2011). We clarified that pine forest in southwestern New Mexico is limited.</p> <p>We provide additional justification for why Mexico is the appropriate lead for recovery and that recovery needs to occur in Mexico.</p>

Commenter	Affiliation	Comment	Response
Sartor O. Williams III (continued)		<p>recovering the species in its native range in Mexico.</p> <p>Specific Comments:</p> <p>p. 1, ¶ 1: I would change the word “confirmed” to “credible.” The word confirmed (or verified) is understood to mean there is a specimen or photo, i.e., tangible evidence. Lacking such, a record can be considered credible if any number of criteria are met (e.g., well-detailed, credible source, multiple observers, etc).</p> <p>p. 1, ¶ 1: The sentence concerning “Extirpation of the ...” has two problems. One problem is the word extirpation implies the species was resident in the U.S., which is not proven (nevertheless, this word is used throughout the draft). The other problem is the “likely caused by excessive shooting” which ignores another (and more likely) reason the species no longer wanders north to the U.S., i.e., lack of recent records reflects fewer birds in Mexico.</p> <p>p. 1, ¶ 1: a word is missing before “of the US/Mexico border.” south?</p> <p>p. 1, ¶ 3: I agree that it is proper to focus primarily on Mexico.</p> <p>p. 1, ¶ 4: It’s clear that better estimates of total population are needed.</p> <p>p. 2, ¶ 4: The two actions listed here for the U.S. are good and about all we can do.</p> <p>p. 3, Recovery Criteria: These are necessarily general, but good.</p> <p>pp. 3-5, Downlisting Criteria: These are good, although (p. 5) I believe the “actively relocate” potential has already been assessed (and found wanting).</p>	

Commenter	Affiliation	Comment	Response
Sartor O. Williams III (continued)		<p>p. 4, “2.b.” I believe “Sierra del Nido” is the usual way to write this, but either way will probably work. This is an isolated range east of the main sierra, famous for grizzlies into the 1950s.</p> <p>p. 5, Delisting Criteria: 2050 is as good a guess as any, and I agree that downlisting is unlikely to be reached before then, and that all the uncertainties about basic knowledge of the species make it unreasonable to conjure up delisting criteria.</p> <p>p. 6: Is “C” missing?</p> <p>P. 16, 1.1.3: The Mexican plan doesn’t address the U.S. situation probably because they understand it is irrelevant to the recovery of the species.</p> <p>p. 17, ¶ 1: I recommend dropping the mysterious 1964 Animas Mts report from this opening paragraph, and go with the 1938 Chiricahua Mts record as the last credible record for the U.S.</p> <p>p. 17, ¶ 2: The speculation that TBPA’s nested in the U.S., but were overlooked, is just that, speculation, which cannot be proven one way or the other. The weight of evidence, however, suggests that all those other ornithologists were likely correct, that the birds that showed up in the U.S. were non-breeding birds from Mexico. Parrots can be quite and secretive in the immediate vicinity of nests, but they are still parrots that need to go off and forage, and would be hard to overlook when doing so. The sky islands are relatively small ranges and were well-tramped from the 1880s onward, especially by ranchers but also by bird students. Ranchers, in particular, combed every canyon, looking for water sources, and it seems clear that these parrots were always a novelty to them (and one they shot with reckless abandon).</p>	

Commenter	Affiliation	Comment	Response
Sartor O. Williams III (continued)		<p>p. 17, ¶ 3: Regarding occurrences in New Mexico, the opening sentence is correct but the citations are confusing. Suggested re-write: “There are historical reports of the species for New Mexico, from the Animas and Peloncillo mountains, but no verified records or physical evidence exists, and the species is not included on the list of species confirmed as occurring naturally in the state (NMDGF 2011, Williams 2007, 2011). The best of these are a second-hand report from the southern Peloncillo Mountains in 1917, and at least one similar report from the Animas Mountains apparently in 1917-18 (Bailey 1928, Wetmore 1935, Ligon 1961, Hubbard 1978); both of these occurred during the most spectacular invasion year ever recorded for the species in Arizona, i.e., 1917-18. Other New Mexico reports, such as an undetailed 1964 Animas Mountains report lacking date, numbers, and other basic data, are best considered hearsay unless substantiating evidence is found. A well-publicized TBPA at a desert ranch near Truth or Consequences, New Mexico, May-June 2003 was judged to have arrived there with human assistance via the illegal cage bird trade (Williams 2007).” [Then put historical AZ reports in a new paragraph?]</p> <p>p. 18, top of page: More speculation about a resident parrot population.</p> <p>p. 18, ¶ 3: The highest elevations in the Animas Mountains (Animas Peak, etc) are in the northern part of the range, not the southern as stated in the addendum (this is shown correctly in Map 1, p. 69). It should be understood that the amount of “forest” in the Animas Mountains is extremely limited, and probably amounts to less than 1000 ac. Much of this has burned in recent years, and regeneration in a warming and drying climate may not assured.</p> <p>p. 22-23: Unfortunately, “...mature and old-growth forest in ...sw. New Mexico...” is extremely limited (if it exists at all...). This discussion about fire, etc in the U.S. again leads to the conclusion that the emphasis needs to</p>	

Commenter	Affiliation	Comment	Response
Sartor O. Williams III (continued)		<p>be on habitats in Mexico.</p> <p>p. 24, fire/salvage discussion: Habitat recommendations in the U.S. should not be single-species focused; all fires, and all snag removal projects may not be good for all species.</p> <p>P. 24, Factor B: The lead sentence ignores the more obvious reason (or, at least, an alternative reason) for disappearance from the U.S., i.e., population crash in Mexico resulted in fewer birds to disperse north to the U.S. And yes, those flocks, which were always considered a great novelty, were shot with great gusto, a testament to the mindset of many Americans of that time toward wildlife.</p> <p>p. 28: The climate change discussion is good and certainly necessary in such a document.</p> <p>p. 32: continuing discussion of “re”introduction: The last two sentences sum it up nicely, and I would leave it at that.</p> <p>p. 32: Recovery Strategy: Nicely put.</p> <p>p. 33: “broad actions” again, nicely put.</p> <p>p. 48: Actions 14, 15, and 16: Seems okay, but I wouldn’t spend much time or money on 16.</p>	

Commenter	Affiliation	Comment	Response
Craig Wilcox, Forest Silviculturist (continued)	Coronado National Forest 711 S. 14th Ave., Suite D Safford, AZ 85546 928-348-1961 work 928-965-1782 cell cpwilcox@fs.fed.us	<p>1.3. Distribution and Habitat Use</p> <p>Correction - Page 18 paragraph 2, upper elevation of the Sky Islands is 3,275 meters (10,750 ft. Mt Graham in the Pinaleños); document stated maximum elevation at 9,800 ft. This later elevation would be the highest point in the Chiricahuas.</p> <p>1.5. Life History</p> <p>In Food Resources on page 20, the “Beckman 1993” citation is not found in the Reference Section so I was unable to review the original paper, however if it is correctly referenced then it is not in agreement with other literature on cone bearing tree ages. Tree age and cone bearing is related but not as strongly as implied in the document. Cone production begins generally within 40 years of tree age and is strongly associated with tree dominance, size and vigor than tree age per se and cone production will taper off in conifers with senescence (Krugman et. al. 1974, Mirov 1967). Large, dominant, healthy trees are the cone producers not necessarily the old trees.</p> <p>Forestry practices that remove a substantial percentage of trees over 40 cm (16 in.) in diameter would have a significant effect on the cone production of an area. Other silvicultural practices could affect cone production as well, both negatively and positively. Uneven-aged silvicultural systems, in general, would be recommended where feasible; since these systems would retain a significant number of cone producing trees continuously onsite. More specifically, the guidelines utilized for the Northern Goshawk in the southwest provides for cone production as conifer seed is the primary food base of many of the prey species for the goshawk and were an important consideration in the development of these guidelines (Reynolds et. al. 1992). Vegetative Structural Stages (VSS) 4, 5 and 6 comprise 60% of the cover classes and are cone producing age classes.</p> <p>I believe that Southwestern white pine and Mexican white pine may be a critical food source for the parrot due to the large size of their seed and the timing of their seed dispersal. Many white pines utilize an animal-based</p>	<p>We agree with corrections and clarifying comments and have incorporated them into the document except where we cite that parrots will also eat immature cones, increasing the period of time cones are available.</p>

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Craig Wilcox, Forest Silviculturist (continued)		<p>seed dispersal strategy. The other pine species (except pinyons) utilize a wind-based seed dispersal strategy that utilizes small winged seeds that are nonsynchronously dispersed. Cones of many white pines ripen and open synchronously as a mean of over supplying seed to the caching animals, usually corvids (Tomback and Linhart 1990). The timing of parrot nesting in the late summer falls within this cone ripening period and would provide an abundant source of food for young. This linkage would be a good area to focus some of the research.</p> <p>Chihuahua pine may be an important food source as well to the parrot. The semi-serotinous cones of this wide-spread species would be a year-round source of food unlike most other pines in Mexico and the Southwestern US which will open and drop their seed over a narrower season (Dick-Piddie 1993). This is the dominant pine of the Madrean Pine-Oak vegetation community which comprises is about 8% of the Coronado and is even more extensive in Northwestern Mexico.</p> <p>Likewise the high diversity of conifers, especially pines, in Mexico must be an important factor to ecology of the parrot since the various species of conifer cones will ripen and have seed available at differing times of the year as illustrated in the table below for the Chiricahua Mountains (assembled from Krugman et. al. 1974) providing for a year round source of ripe cones. The maturing seed in the unripe cones would lengthen this availability of seed for about an extra month (See Table 1 on Period of available ripened cones for conifer species of Chiricahua Mountains</p> <p>1.7. Threats</p> <p>In the Habitat Loss section I had a problem with the following statement and recommend reviewing the original source to ensure the accuracy of the statement: "... thickbilled parrots need forests that are an average of 326 years old for Southwestern white pine , also known as Mexican white pine, and Durango white pine (Pinus durangensis) for nesting and feeding (Lammertink et al. 1996, CONANP-Pronatura Sur 2008, CONANP 2009)."</p>	

Commenter	Affiliation	Comment	Response
Craig Wilcox, Forest Silviculturist (continued)		<p>I was unable to find this paper, although it is referenced by a lot of researchers. It was not clear to me if the 326-year average age was referring to the age of the forest or to age of the nesting and feeding trees; the age would be questionable for a feeding trees but reasonable for nesting trees, assuming these were different trees in the study. Forest or stand age seems the most likely if the study was referring to the ages of the dominant trees. It is very unlikely that it would be average age of feeding trees. Also note that Durango pine is a yellow pine not a white pine as stated. It is closely related to Ponderosa, Apache and Arizona Pine, all are yellow pines. One of the common names in Mexico for Durango pine is “pino blanco” but the translation to white pine would be inappropriate because white pine and yellow pine are used as common names for the two major subsections in the Pinus genus, this usage would be confusing to readers.</p> <p>White Pine Blister Rust – I recommend adding a statement about this disease. White pines in New Mexico and Arizona are threatened by an invasive fungus, white pine blister rust (<i>Cronartium ribicola</i>) (Conklin et al 2009). First found in the southwest on the Lincoln National Forest in 1990, it has now been discovered on the Alpine District of the Apache-Sitgreaves National Forest. It has not been found in Southwestern white pine on the Coronado but it is expected to appear within the next several decades. This exotic disease is a significant threat to white pines and has become a major tree disease in many parts of the US and is expected to become a major disease of white pines throughout their range in North America (Tomback and Achuff 2010) including Mexico. Zeglen et.al (2010) provides an excellent review of silvicultural practices for addressing this disease in white pine stands in the west.</p> <p>In Forest Management on page 23 the correct size of Chiricahua Ecosystem Management Area (EMA) is 291,496 acres; the figure given is the acreage of Chiricahua Wilderness only.</p>	

Commenter	Affiliation	Comment	Response
Tim Wright	Associate Professor Department of Biology MSC 3AF New Mexico State University Las Cruces, NM 88003 wright@nmsu.edu	<p>There is substantial scientific expertise and interest in this species that is currently untapped. After a meeting of interested parties in Douglas AZ in December 2006, a “Binational Scientific Advisory Group” was nominated that included members from a broad array of stakeholder institutions (conservation NGO’s, zoos, universities, and governmental agencies from the US and Mexico). Some, but not all, of these people were involved in the framing of the PACE, and most have been involved directly in scientific study or conservation efforts for this species and other parrot species at some point. I think reconvening such a group would be an effective way to stimulate research to address the information needs that figure so prominently in the list of conservation actions.</p> <p>Time frame and cost to recovery. Difficult to judge both the time frames and estimated costs, particularly as it is completely unclear where this support would be coming from and who it would be supporting.</p> <p>Translocations. Translocations are becoming less and less feasible due to the small numbers of birds available, regulatory barriers, and low rate of success of trial efforts. Release of captive birds in the US needs to be strongly considered as a more realistic alternative.</p>	<p>We acknowledge the work the binational working group accomplished in recovery plan addendum and agree that reconvening a working group would benefit thick-billed parrot recovery.</p> <p>We agree that translocations may be difficult due to regulatory barriers and the small number of birds available and we provide additional background information in the document. We provide additional information regarding our concerns about using captive-bred birds for reintroductions in the historical range in the U.S., high cost of using this method, and the risk of reintroducing captive-bred birds into fragmented habitat with an unpredictable food supply. We provide justification for recovery actions that we believe are more cost-effective and more likely to be successful.</p>
Barnaby V. Lewis with email from Larry Benallie, Jr.	Tribal Historic Preservation Officer Gila River Indian Community Sacaton, AZ 85147	<p>GRIC Tribal Historic Preservation office agrees with USFWS plan to protect TBPA in Sierra Madre Occidental Mountains. Many endangered species hold high significance in O’Odham oral history and we support projects where goals are to restore and recover those species. The undertaking is located on ancestral lands of the Four Southern Tribes (GRIC, Salt River Pima-Maricopa Indian Community, Ak-Chin Indian Community, and Tohono O’odham Nation). Agree that a FONSI is sufficient.</p>	<p>The archaeological record in the Southwest demonstrates the importance of parrots, including TBPA, in historical Native American culture. We acknowledge tribal support for thick-billed parrot recovery.</p>

Commenter	Affiliation	Comment	Response
Taylor Jones, M. Sc.	<p>Endangered Species Advocate WildEarth Guardians www.wildearthguardians.org 1536 Wynkoop St., Suite 301 Denver, CO 80202 303-573-4898 x 1159 tjones@wildearthguardians.org</p>	<p>WildEarth Guardians (Guardians) August 20, 2012 comments on the Draft Recovery Plan Addendum for the Thick-billed Parrot (<i>Rhynchopsitta pachyrhyncha</i>)</p> <p>WildEarth Guardians is expecting a response to the numbered comments “as required.”</p> <p>Requirements Under Guardians’ Settlement Agreement The Service will determine whether the PACE is consistent with ESA section 4(f), 16 U.S.C. § 1533(f). The Service will then prepare a draft addendum to the Mexican thick-billed parrot recovery plan [the Programa de Acción para la Conservación de las Especies: Cotorras Serranas (<i>Rhynchopsitta</i> spp. (PACE))] that will serve as the recovery plan. The draft addendum will incorporate the provisions of the PACE and any additional elements that are necessary to meet the requirements for a recovery plan under section 4(f) of the ESA, including recovery considerations in the United States. By June 30, 2012, the Service will submit to the Federal Register a Notice of Availability of, and opportunity for the public to comment on, the draft addendum, including the provisions of the Programa de Acción para la Conservación de las Especies: Cotorras Serranas (<i>Rhynchopsitta</i> spp. PACE) and any other elements that the addendum incorporates. The Service will then prepare a final addendum that will serve as the final recovery plan. The final addendum will incorporate the PACE and any elements that the addendum incorporates to meet the requirements for a recovery plan under ESA section 4(f), and will address any public comments received. The Service will submit a Notice of Availability of the final addendum to the Federal Register by June 30, 2013. (Settlement Agreement 2010 at 3, emphasis added). Here we examine whether the draft recovery plan addendum meets the requirements of ESA Section 4(f), particularly in regards to recovery in the United States.</p> <p>ESA Section 4(f), 16 U.S.C. § 1533(f) Requirements “To the maximum</p>	<p>Responses correspond to numbered WildEarth Guardians comments.</p> <p>1. FWS maintains that thick-billed parrot recovery is likely to fail if populations and habitat are not first protected in Mexico where they are the most vulnerable. If habitat is protected in Mexico and the thick-billed parrot population increases, birds may or may not expand naturally into suitable habitat in the United States. We believe historical habitat within the U.S. is limited to the Sky Islands and may not provide adequate food resources to sustain a viable population. We consider the historical range of the TBPA to be the Sky Islands of Arizona and New Mexico. We provide information on archaeological records and use of parrots by Native Americans in the recovery plan addendum.</p> <p>1 (2). FWS provides additional background information and guidance on evaluating feasibility, risks, and appropriateness of conducting translocations of individuals into historical and potential habitats in the U.S. as part of a comprehensive conservation strategy. We provide a general review of U.S. historical habitat, current habitat management, and habitat connectivity with Mexico. However, this task is retained as a recovery action because further evaluation is needed and conditions are likely to change in the context of climate change.</p> <p>2. USFWS will provide additional language making it clear that the downlisting criteria to be developed through additional research and monitoring will include actual population numbers required for a self-sustaining population of thick-billed parrots sufficient to ensure the species’ survival.</p> <p>2 (4). USFWS considers historical habitat to be the Sky Islands of Arizona and New Mexico for reintroductions. USFWS is not evaluating the potential for introductions into non-historical habitat. We provide some additional background information on historical records. A recovery plan is a guidance document and cannot be used as an enforcement document. However, it can be used to guide agencies in developing management plans that promote</p>

Commenter	Affiliation	Comment	Response
Taylor Jones, M. Sc. (continued)		<p>extent practicable” a Recovery Plan shall:</p> <p>1. Include “a description of such site-specific management actions as may be necessary to achieve the plan’s goal for the conservation and survival of the species.” 16 U.S.C. § 1533(f)(1)(B)(i). The recovery plan notes that the “U.S. has little authority to implement actions needed to recover species outside its borders, especially when recovery requires the employment of laws and regulations” (Recovery Plan 2012 at 26). WildEarth Guardians states that the recovery plan seems to be attempting to dodge several issues by emphasizing that the “primary focus of recovery conservation for the thick-billed parrot must be within Mexico.”</p> <p>(1) U.S. Habitat Protections. WildEarth Guardians point out that protection of habitat, including designation of critical habitat, in the U.S. would appear to be extremely important to the recovery and survival of the species. The parrot is in a precarious situation in its current range: Reduced population size is considered a threat to the species, because the breeding populations are relatively small and concentrated in a handful of sites, which makes them vulnerable to catastrophic events. Large areas of old-growth forest are no longer found in the Sierra Madre Occidental and as the average age of trees and conifer forest decreases, so do parrot nesting sites and food resources. (Id. at 27, internal citations omitted) Despite the parrots’ circumstances in their occupied range, FWS seems to assume that efforts to conserve the parrot in Mexico will be successful. This is not guaranteed. Despite the best efforts and commitment of the Mexican government, conservation efforts in the parrots’ Mexican range may fail. “The parrot exhibits a patchy distribution across its vast range in Mexico and many of these areas are difficult to access because of their remoteness and potential danger, therefore accurately estimating range-wide population numbers for the species has been challenging” (Id. at 21). Most of the parrots’ historic range in Mexico is already gone. “Only one percent of the old-growth forests are estimated to remain, and thick-billed parrots need forests that are an average of 326 years old for Southwestern white pine,</p>	<p>recovery and minimize impacts of proposed actions.</p> <p>1 (1). FWS provides additional clarifying information regarding habitat conditions, protection, and the amount of suitable habitat in the United States. Designation of critical habitat is a separate rule making process from recovery planning. FWS has no plans to designate critical habitat for thick-billed parrots. Critical habitat offers no protection against the threat of stand-replacing wildfire and climate change, which are probably the greatest threats to mature and old-growth conifer forest in the Sky Islands. Conifer habitat is already protected from second-growth and old-growth logging, and other management actions to reduce the likelihood of stand-replacing wildfire are underway through implementation of the Coronado National Forest Plan and Firescape program. We have also updated information presented on the mature and old-growth forest in Mexico. Despite continued threats to conifer forest in Sierra Madre Occidental in Mexico, habitat there is more contiguous and extensive than the isolated Sky Island conifer forests in the U.S.</p> <p>The Coronado National Forest Plan (2011) describes management, including fire management, by habitat type. We believe implementation of these strategies will protect conifer habitat as much as is reasonably possible, with the caveat that stand-replacing wildfire and climate change are a continuing threat. USFWS describes fire management strategies that are compatible with protecting suitable habitat for thick-billed parrots. Southern Arizona and New Mexico forests are not timber producing forests, so logging has never been a limiting factor. Enhancement of suitable habitat in the Sky Islands is not easily controlled, especially where decades of fire suppression increases the risk of a high-intensity stand-replacing fire. Some management actions can be implemented such as conducting controlled burns that reduce the probability of stand-replacing fires. Restoration activities following a high-intensity fire may or may not increase the rate of conifer re-establishment. Climatic conditions such as rainfall, temperature, and wildfires are probably a greater predictor of conifer re-establishment than management. Future climate change</p>

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Taylor Jones, M. Sc. (continued)		<p>also known as Mexican white pine, and Durango white pine (<i>Pinus durangensis</i>) for nesting and feeding” (Id. at 22, internal citations omitted). If the recovery of the species is entirely dependent on the existing range and possible regeneration of old-growth habitat in Mexico, it may become a race between logging and land conversion pressures and regeneration. “Habitat regeneration is a long-term process and 100 to 300 years may be needed to fully restore habitat” (Id. at 7). However, “[a]bout 0.7% of Mexico’s forestland is deforested each year... Of [Canada, Mexico, and the U.S.], only Mexico is currently experiencing significant net loss land in forest use due to conversion” (Masek et al. 2011 at 12). Illegal logging is also a concern (Id. at 14). The habitat in Arizona has proven to be less vulnerable to logging and other human disturbance. “Unlike Mexican forests, the rather inaccessible southeastern Arizona forests were not subjected to the same timber harvest pressure common to so many other forests in the 20th century” (Recovery Plan 2012 at 22). Although some of the more accessible pine forests of the parrot’s U.S. range were historically impacted by timber production, significant portions of the habitat in Arizona remain intact and in suitable condition. Mature high-elevation conifer forests in southeastern Arizona exist on several mountain ranges, and virtually all of these areas are Federal lands, with most under the jurisdiction of the Coronado National Forest. These forests face low development pressures as they are primarily managed for their recreation and watershed values, with no active timbering. (Id. at 18, internal citations omitted). Despite implications that habitat in the U.S. could provide a stronghold for the parrot, protections for this habitat are only cursorily addressed, with the plan stating: “Actions in the U.S. include maintaining forested habitat in southeastern Arizona and southwestern New Mexico for potential use by parrots dispersing north from the Sierra Madre Occidental and preventing illegal trade of thick-billed parrots into this country” (Id. at 2). The areas to be “maintained” are not defined, nor does the plan elaborate on what is required for “maintenance.” Designating the forested habitat mentioned as critical habitat for the parrot under the ESA</p>	<p>may not be favorable to conifer habitat used by parrots in the Sky Islands of the U.S. As temperature increases in the Sky Islands, habitat is likely to be pushed farther up in elevation, shrinking the amount of conifer habitat. Sky islands in the Southwest and Mexico are already being affected by climate change, with increases in drought, fire, and outbreaks of invasive insects. A recent assessment of climate change in the Southwest found that many Sky Islands forest systems are among the most vulnerable to climate change because of the combination of most rapid recent temperature increases and wildfire. Historically, wildfires have played an important role in the vitality of fire-adapted ecosystems. Past management and fire suppression practices have changed the dynamics of fire on the landscape within the Coronado NF, resulting in greater fuel-loads and risk of wildfire. Since about the mid-1970s, the total acreage area burned and the severity of wildfires in pine and mixed-conifer forests have increased on the Coronado NF. Fire frequency and severity will likely increase as temperatures rise and precipitation decreases. Population growth in the Southwest may also lead to greater numbers of human-started wildfires.</p>

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Taylor Jones, M. Sc. (continued)		<p>would be the most effective way to conserve it and to provide important options for future recovery. “In the case of critical habitat, conservation represents the areas required to recover a species to the point of delisting (i.e., the species is recovered and is removed from the list of endangered and threatened species). In this context, critical habitat preserves options for a species' eventual recovery” (Cheever 1996 at 33). “The prohibition against destruction or adverse modification of critical habitat should protect the critical habitat's ability to contribute fully to a species' recovery” (Id.). However the recovery plan makes no mention of critical habitat aside from stating that it has not yet been designated.</p> <p>(2) Reintroduction to U.S. Range. WildEarth Guardians states the issue of reintroduction is only vaguely addressed. “Although reintroductions are recognized as a conservation strategy, their feasibility, appropriateness, and possible approaches need further evaluation, particularly given the low populations of remaining wild thick-billed parrots, the importance of preserving the remaining old-growth habitat, the bird’s social nature and minimum flock size necessary for success, predator avoidance, food availability, adaptive behavior to a novel location, past responses to relocation, and potential for spreading disease” (Recovery Plan 2012 at 32). This is certainly true – however the recovery plan offers no clear way to address these concerns. The stated goal is to “[e]valuate feasibility, risks, and appropriateness of conducting translocations of individuals into historical and potential habitats as part of a comprehensive conservation strategy” (Id. at 48), with subgoals including “[s]upport research efforts to evaluate techniques for translocating parrots for the potential establishment or reestablishment of new populations... Conduct a review of U.S. historical habitat, current habitat management, and habitat connectivity with Mexico... Assess the feasibility, risks, and appropriateness of translocating parrots into historical and potential habitats in the U.S” (Id.). Snyder et al.’s (1994) assessment of reintroduction concludes that it may be difficult – however this is no reason to shy away from the attempt, and the FWS has successfully taken on such projects in the past. Though the</p>	

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Taylor Jones, M. Sc. (continued)		<p>primary nesting beach at the time recovery planning began was in Mexico, re-establishment of nesting at Kemp’s ridley sea turtle habitat in the U.S. was a crucial part of achieving the “goal of the long-term, bi-national effort to... form a secondary nesting colony of Kemp’s ridleys at [Padre Island National Seashore]” (Kemp’s Ridley Recovery Plan 2011 at II-7). Delisting goals for the Kemp’s ridley include healthy breeding populations in the U.S. and permanent protections of U.S. nesting beaches (Id. at viii). Given these precedents, it is unclear why the establishment of a breeding parrot population in the U.S., which Snyder et al. deemed biologically feasible with sufficient numbers of high-quality birds, is not more of a priority in this recovery plan. Evaluation of risks and further research are certainly important, and the plan projects that such an assessment will take 5 years (Recovery Plan 2012 at 69). However the plan does not include any preparation for possible reintroduction during that five-year period or describe what resources will be available for the next step if it is determined that reintroduction is feasible. If the thickbilled parrot needs hundreds to thousands of released birds to establish a viable wild population (see Snyder et al. 1994), an important first step would be increasing the numbers of birds in captivity, as well as investigating cost-effective ways to train them in wild behavior including feeding and flocking. As of 2011, there are only about 91 thick-billed parrots in captivity in the U.S. in 19 different zoos. These birds are all enrolled in a Species Survival Program – however this program is not mentioned or supported in the recovery plan and no efforts to increase the captive population are mentioned.</p> <p>2. Include “objective, measurable criteria which, when met, would result in a determination, in accordance with the provisions [of the ESA], that the species be removed from the list.” 16 U.S.C. § 1533(f)(1)(B)(ii). (3) Demographic Downlisting Criteria. According to the plan, it is not possible to establish delisting criteria for the species at this time. Therefore the plan focuses on downlisting criteria, and on obtaining the data needed to establish delisting criteria prior to 2050 (Recovery Plan 2012 at 5).</p>	<p>The Arizona Firescape Program is organized by geographic area, with some management plans completed and others underway. The Chiricahua FireScape Project is intended to reduce the costs, damage, and threats to safety from wildfires; sustain fire in fire-dependent ecosystems; maintain manageable fire behavior; and move vegetation toward a more “fire-resilient” condition. This approach aims to increase fire management flexibility, efficiency, and consistency across approximately 500,000 acres of grasslands, woodlands, and forests. Proposed activities include prescribed fire, thinning, mechanical treatments, fuelwood harvesting, and some use of herbicides. These treatments are not uniformly applied across all ecological types but rather used singly or in combination as conditions dictate. For example, the primary purpose of Chiricahua firescape project is to integrate the fire and fuel management activities across 500,000 acres of Federal, State, and private lands to achieve the following objectives: reduce the costs, resource damage, and threats to public and firefighter safety from future wildland fires; restore and sustain ecological processes in fire-dependent ecosystems; create and maintain fuel conditions that produce manageable fire behavior and intensity; and alter existing vegetation and fuel conditions, as feasible, to approach those reflective of the historic range, both in the broader landscape and within individual ecological systems. The multi-agency project partners estimate annual accomplishments in the Chiricahua Mountains will include the application of prescribed fire on 6000 to 40,000 acres; mechanical treatment of 1000 to 3000 acres; and thinning of 200 to 500 acres (http://www.azfirescape.org/sites/azfirescape.org/files/chiricahua_draft_scoping_2-24-11-.pdf).</p> <p>3. WildEarth Guardians advises it would be more appropriate to provide an estimated timeframe that includes an outer estimate rather than the indefinite time frames that appear in the draft implementation schedule (e.g., “greater than five years”). While FWS agrees, we do not currently possess the information needed to estimate a more definite timeframe. WildEarth Guardians acknowledges that FWS intends to review the recovery plan and establish</p>

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Taylor Jones, M. Sc. (continued)		<p>Dowlisting criteria include measurable goals such as ensuring that “at least 15 years of systematic surveys document a stable or increasing trend in at least 5 known wild thick-billed breeding populations...” As well, “[m]inimum viable population size and number of breeding colonies are to be established through research and modeling, including better understanding of non-reproductive groups” (Id.). The actual population numbers required for a “self-sustaining population of thick-billed parrots sufficient to ensure the species’ survival and to address threats of inadequate foraging, breeding, and wintering habitat; small population size; and climate change” (Id.) will hopefully be established through that research, but this intention is not stated in the downlisting criteria.</p> <p>2 (4). Habitat Protection Criteria. For habitat protection in the U.S., the recovery plan offers the following goals: “Preserve and enhance U.S. historical habitat and augment cross border connectivity of habitat...</p> <p>Develop and implement strategies to preserve and enhance historical habitat in the mountains of Southeastern Arizona and Southwestern New Mexico” (Id. at 48). 2 http://zooamerica.wordpress.com/2011/09/03/2-endangered-thick-billed-parrots-hatch-at-zooamerica/ This leaves several important questions unanswered: How is the historic habitat being determined? What does “preserve and enhance” mean legally in this context, and is it enforceable? Will critical habitat be designated? The recovery plan should address these questions in order to render the goals “objective” and “measurable.” The plan mentions only that this strategy is “in progress” under the Firescape Program and that the expected time to completion is greater than five years (Id. at 68). More than five years is a vague estimate of the time required, particularly since “preserving and enhancing” the habitat is also a vague goal. Does this mean FWS will simply wait 100-300 years for forests to regenerate themselves? Does it mean designating critical habitat or implementing other legally enforceable habitat protections at some unidentified point in the future? The recovery</p>	delisting criteria once additional research is completed. WildEarth Guardians recommends that time estimates could also be revised at that time.

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Taylor Jones, M. Sc. (continued)		<p>plan does not make this clear.</p> <p>The Firescape Program itself is not explained in the body of the plan, nor is the way in which the program is expected to benefit the parrot, with the plan stating only that “in the U.S., with the recognition that... heavy fuel loads need to be reduced, and fire needs to be reintroduced as a natural process to restore the ecological balance, the FireScape program has taken a landscapescale approach for fire management across multiple land ownerships in the mountains of southeastern Arizona” (Id. at 23, internal citations omitted). There follows a discussion of various fire-management strategies and the controversies surrounding salvage logging, but nowhere is it made clear how the fire management strategies or salvage logging in general may impact the parrot and its habitat. Based on the information available in the plan, the Firescape Program is not sufficient to protect parrot habitat, as it appears to be a fire-management strategy with no specific considerations for the parrot.</p> <p>3. Include “estimates of the time required and the cost to carry out those measures needed to achieve the plan’s goal and to achieve intermediate steps toward that goal.” 16 U.S.C. § 1533(f)(1)(b)(iii). (5) Timeframes. some of the timeframes given in the recovery schedule are vague, stated as “greater than five years” or similar indefinite periods. It would be more appropriate to provide an estimated timeframe that includes an outer estimate. FWS intends to review the recovery plan in light of future research and establish delisting criteria; time estimates could be revised at that time if necessary.</p>	

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James D. Gilardi, Ph.D.	Executive Director World Parrot Trust jamie@parrots.org	<p>The following are excerpted comments:</p> <p>1...primary concern is the manner in which this Plan was created. By simply translating and copying a plan created in Mexico, the Service has effectively ignored the fact that 1. this species once occurred well into Arizona and likely New Mexico, and that 2. these regions in the USA, which hold substantial and well-protected habitat, may well prove to be essential to the future recovery of this species. Concerned that there is no mention of creating a Recovery Team.</p> <p>2. Contributions captive birds may make to the recovery of this species are ignored...strongly urge the inclusion of a plan to actively and aggressively manage all captive individuals, the creation of a purpose-built captive breeding and release facilities, and the active involvement of these resources in all broader recovery activities....</p> <p>Page 34. Additional recovery objectives for U.S. - the intensive management of the captive birds for conservation in zoos and private collections in the USA, Mexico, and Europe should be an obvious objective. Given the scarcity of known wild breeding pairs in the wild in Mexico, and the unlikelihood that any can or should be translocated in the foreseeable future, these captive birds are extremely important for the future of this species and should be managed accordingly. Establishment of a purpose-built breeding center in the species' historic range would facilitate such efforts, help educate the public and private sector about the plight of this species, and ultimately provide a foundation for reintroductions in future years.</p> <p>Include how small and desperately threatened these crucial bits of Sky Islands are in reality. Each one of these standing forests is of great cash value, each is prone to serious fire risk (accidental or otherwise), each is used extensively for the production of illegal drugs. Plan has not attempted a serious evaluation of these areas and their likely role in the recovery of the thick-billed parrot.</p>	<p>The responses below correspond to comments in the Comments Column. If comments were addressed in a previous response, the response was not repeated.</p> <p>1. The recovery plan addendum addresses the species status in the U.S., current habitat conditions, and future habitat conditions in the context of climate change. We maintain the current habitat conditions are even less favorable than when TBPAAs were reintroduced in the late 1980s and early 1990s. Given the continued drought, recent stand-replacing fires, and climate change in the Sky Islands, we believe reintroductions within the historical range in the Sky Islands of Arizona and New Mexico at this time are likely to be unsuccessful.</p> <p>2. We agree that management of the captive birds for conservation in zoos and private collections in the U.S., Mexico, and Europe should continue. We agree that these facilities fulfill an important role in educating the public and private sector about the recovery needs and can have a positive effect on the future of this bird. In the mid-1990s, the Thick-billed Parrot Species Survival Plan (SSP) Management Group redefined its goals to de-emphasize the release of captive birds, address the problems discovered in the early releases (such as disease), and increase SSP support of free-living populations. The goal of the Thick-billed Parrot SSP Management Groups is to ensure the survival of the thick-billed parrot within its historical range by maintaining a captive population, educating the public regarding the conservation of native endangered species, and supporting the wild populations and their habitat.</p> <p>We agree that high-intensity fire and excessive logging in Mexican pine forests are significant threats to thick-billed parrots and that they are likely to continue. We emphasize the need for effective conservation planning and implementation in Mexico's pine forests. CONANP is currently funding monitoring and development of management plans in some of the most important known TBPA habitat in Mexico. Despite the ongoing threats to</p>

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James D. Gilardi, Ph.D. (continued)		<p>3. Working in close collaboration with NGO's and government agencies in Mexico and the USA, including the FWS, WPT hosted and participated in a number of planning meetings and field activities focused on the conservation of the thick-billed parrot. These collaborative efforts have benefitted from the input of well over a dozen Ph.D.s and veterinarians who collectively have enormous experience with this species and other threatened parrots, both in captivity and in the wild and on both sides of the border. This draft Plan overlooked the fact that these activities occurred and the recommendations of the experts involved.</p> <p>...urge the Service to host a workshop to involve scientists, conservationists, and agency personnel from the USA and Mexico to provide a global perspective on the recovery of the thick-billed parrot throughout its historic range. Overlooked the essential role of non-governmental organizations and private individuals. Most glaringly, Wildlife Preservation Trust International hired Dr. Noel Snyder to run this program for years and a great deal of the work was done on the private property of Josiah and Valer Austin.</p> <p>Page 32. Prior to the meeting that produced the PACE document, NGO's from Mexico and the USA conducted a series of meetings regarding the recovery of the Thick-billed Parrot, with all appropriate agencies and researchers invited and participating. The team from ITESM spearheaded this series of meetings, and AZ Game and Fish and Fish and Wildlife personnel attended nearly all these meetings. These efforts led directly to extensive discussions of translocations within Mexico and north of the border, aerial surveys, an experimental translocation, disease sampling of wild birds, and nest box experiments among other outcomes. A US Plan should note that this work has been done and should be substantively informed by their findings and activities.</p>	<p>Mexican pine forests, the Sierra Madre Occidental contains far more contiguous suitable TBPA conifer forest habitat than the historical U.S. habitat.</p> <p>3. We agree that the role of non-governmental organizations and private individuals have made important contributions toward recovery. We have added a sentence acknowledging the role of NGOs and private individuals in thick-billed parrot conservation.</p> <p>We agree that the thick-billed parrot working group should continue with planning and field activities focused on recovery. Members of this working group contributed to and peer-reviewed the draft recovery plan addendum.</p> <p>We added language acknowledging that, prior to the preparation of the PACE, a series of bi-national meetings were held to discuss recovery of the thick-billed parrot, with participation from non-government organizations, agencies, and researchers from Mexico and the U.S. Results from these meetings and the implemented conservation efforts contributed toward the PACE and this recovery plan addendum</p> <p>4. We agree that thorough rangewide population surveys are needed to establish baseline population numbers and to help determine the extent of occupied habitat in Mexico. We have included actions addressing survey needs in the Recovery Criteria for downlisting. We have also revised the 1.6 Abundance and Trends, Breeding Population section.</p> <p>5. We included information on the TBPA archaeological record in the southwestern U.S. The origin of the TBPA's documented in the Verde Valley in the 1583, Espejo Expedition, is unknown. Thick-billed parrot bones and feathers have been found in a number of Native American archaeological sites. Live thick-billed parrots were likely traded for their feathers.</p>

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James D. Gilardi, Ph.D. (continued)		4. Page 1 & 2. These numbers aren't based upon scientific sampling of the wild birds. More useful in this context would be to state specifically how many active nest sites have been found at each of the known breeding areas for the past 5+ years.	<p>6. We agree that climate change will likely drive TBPA habitat "upwards" in terms of both elevation and latitude, which is one reason why reintroducing parrots into the historical U.S. habitat in the Sky Islands is riskier than conducting recovery activities in suitable habitat in Mexico. This Recovery Plan does not explore releasing TBPAs north of the historical range, as this would be an introduction rather than a reintroduction. See reintroduction input in previous paragraphs.</p> <p>7. As requested, we include cost estimates for reintroducing captive-bred birds in the recovery plan addendum largely based on the annual Puerto Rican Parrot program costs. The high cost and risk of reintroducing captive-bred birds in the historical U.S. habitat makes this a less desirable option than implementing lower cost, higher priority recovery actions in Mexico in suitable habitat.</p> <p>8. Although it is true we do not know the outcome of all the released birds because some of them dispersed and researchers were unable to follow them, the outcomes we do know about lead us to conclude that there are substantial limiting factors that must be resolved before any future releases would be approved in U.S. historical habitat. We believe other recovery actions in Mexico are more likely to contribute greater recovery results.</p>

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<p>John Fitzgerald, J.D., SCB Policy Director and Brett Hartl, Senior Policy Fellow</p>	<p>Society for Conservation Biology 1017 O Street NW Washington, DC 20001 www.conbio.org/policy</p>	<p>1. Society for Conservation Biology supports recovery activities in Mexico as the most urgent areas for conservation action because the Sierra Madre Occidental of Mexico currently represents all of the Thick-billed Parrot’s current range. However, recovery of the Thick-billed Parrot within its historic U.S. range is also essential. The recovery plan does not provide sufficient detail or a timeline for actions that the FWS should take under all of its authorities under the Endangered Species Act (ESA) with respect to habitat protection and future reintroductions. In particular, we believe that the FWS should designate critical habitat within the United States for the Thick-billed Parrot, and that the recovery plan must provide a timeline for accomplishing this activity. Relatedly, the recovery plan should identify agency actions within both the United States and Mexico that would trigger the requirement under Section 7 of the ESA to ensure that Federal agency actions do not jeopardize the Thick-billed Parrot.</p> <p>In addition, the recovery plan should discuss the usage of its authority under Section 10(j) of the ESA regarding the establishment of experimental populations of Thick-billed Parrot within the United States as a means of returning the parrot to its historic range.</p> <p>2. Finally, the recovery plan should discuss possible FWS law enforcement strategies and efforts that could be used to further stem the illegal parrot trade and rescue birds held illegally in captivity, a violation of the Lacey Act and the Endangered Species Act given its status as an Appendix I species under CITES.</p> <p>3. Since the 1986-1993 reintroduction efforts, conservation techniques for parrot species have continued to improve. The most important innovation for Thick-billed Parrot appears to be the use of nest-boxes to encourage parrot breeding, which has been limited due to the absence of snags for nesting. Nest boxes were not used in the early reintroduction efforts. Currently, there is a source population of 95 Thick-billed Parrots in</p>	<p>1. We have no plans to designate critical habitat in the U.S. for TBPA. The Forest Service is already conserving mature and old-growth forest in historical TBPA habitat on the Coronado National Forest. The greatest threat to the U.S. habitat is wildfire, especially in the context of fuels that have accumulated since the mid-20th century and climate change. Fire Management Plans are in place and are implemented to respond to wildfire. Federal actions within the U.S. that may affect threatened or endangered species already require Section 7 Consultation. The USFWS has no section 7 authority outside the boundaries of the U.S.</p> <p>2. The USFWS prohibits unauthorized importation of listed species into the U.S., prohibits persons subject to U.S. jurisdiction from engaging in commercial transportation or sale of listed species in foreign commerce. The “take” prohibitions of section 9 of the ESA only apply within the U.S. One of the Recovery Criteria for downlisting is to reduce the threats of illegal collecting and poaching of thick-billed parrots for the pet trade to the point that they no longer impact thick-billed parrots. This can be accomplished by enforcing existing environmental laws, regulations, plans, and policies for parrot protection.</p> <p>3. We acknowledge that conservation techniques for parrots have improved over the last 20 years and agree that the use of nest boxes in Mexico has been successful where adequate food resources exist. Continued use of nest boxes show the most promise in Mexico, where nest trees are lacking and parrots and food resources remain.</p>

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<p>John Fitzgerald, J.D., SCB Policy Director and Brett Hartl, Senior Policy Fellow (continued)</p>		<p>captivity under a species survival plan that could be used, if augmented, to support a release program.</p> <p>4. Restoring a population of Thick-billed Parrot within the United States is also biologically important for the species itself. Research indicates that populations at the edge of a species' range play an important role in maintaining the total genetic diversity of a species; especially in situations where habitat fragmentation and habitat loss impact the total range of the species (Chanell and Lomolino 2000). Peripheral populations can be an important genetic resource in that they may be also notes that even if the Thick-billed Parrot were to fully recover in Mexico, it would still qualify as a threatened or endangered species because the United States range of the parrot is a significant portion of the species' range. A global community of conservation professionals beneficial to the protection of evolutionary processes that are likely to generate future evolutionary diversity. This may be particularly important considering the potential impacts of climate change and the changes in habitat that may result in both Mexico and the United States. The ability for Thick-billed Parrots to use habitat within the United States is therefore ecologically and biologically important to the recovery of the species.</p> <p>5. Criteria for recovery in the United States are deficient. This deficiency cannot go unaddressed because the ESA is, in part, designed to meet the United States obligations under the Convention on Nature Protection and Wildlife Preservation in the Western Hemisphere.</p> <p>... we have concerns about the lack of specific recovery criteria and concrete recovery tasks that the FWS has proposed within the United States for the Thick-billed Parrot, and we are concerned that the agency may propose downlisting of the species to "Threatened" even if the species has not re-colonized its former range within the U.S. Therefore, SCB offers the following recommendations for the final recovery plan:</p>	<p>The U.S. historical habitat consists of isolated Sky Island conifer forests separated by large expanses of unsuitable lower-elevation habitat. The U.S. historical habitat is currently lacking adequate food resources to support a flock of thick-billed parrots and, with recent fires, available suitable habitat in the Sky Islands is even more fragmented than during the failed releases in the late 1980s and 1990s. In Mexico, although excessive logging continues to degrade habitat, suitable forest habitat still remains in large contiguous expanses. We believe the greatest likelihood of establishing genetically viable self sustaining populations needed for recovery exist within Mexico.</p> <p>4. We agree that populations at the edge of a species' range play an important role in maintaining the total genetic diversity of a species; especially in situations where habitat fragmentation and habitat loss impact the total range of the species (Chanell and Lomolino 2000). We have added this to the plan and we do not rule out the possibility of shifting or expanding thick-billed parrot occupancy in response to changes in forest structure, climate change, or population increase in the future. The edges of the currently known breeding and wintering range are in Mexico rather than in the United States. The edge of the current breeding range is the northern Sierra Madre Occidental in Chihuahua and Durango but additional surveys are needed where unsurveyed or infrequently surveyed suitable habitat exists. Even less is known about the edge of the winter range, especially in the southern part of the range, and more survey coverage is needed. Because thick-billed parrot populations occur at the edge of their range in Mexico, conservation of these edge of range populations would, therefore, occur in Mexico.</p> <p>5. We have included additional detail in the Recovery Criteria for downlisting in the recovery plan addendum. However, some downlisting Recovery Criteria could not be quantified due to lack of information so we have identified a number of Recovery Criteria and Actions Needed to fill in the information gaps. For example, the breeding and wintering range need more thorough surveys.</p>

Commenter	Affiliation	Comment	Response
<p>John Fitzgerald, J.D., SCB Policy Director and Brett Hartl, Senior Policy Fellow (continued)</p>		<p>A. Downlisting from “Endangered” to “Threatened” Status Cannot Occur Until at Least One Self-Sustaining Population of Thick-billed Parrot is Established Within the United States that is Connected Via Natural Dispersal to the Mexican Meta-Population.</p> <p>There are no measurable recovery criteria for any populations in the United States. Instead, the only downlisting criteria is that the “potential for the U.S. to support naturally dispersing or actively relocated thick-billed parrots is assessed, including a review of U.S. historical habitat, current habitat management, and habitat connectivity with Mexico. The need and efficacy of translocating parrots are included in the assessment.” An assessment of recovery within the United States is insufficient as a recovery objective for downlisting...we recommend that a recovery criterion should be added to the plan that requires at least one self-sustaining population of Thick-billed Parrot within the United States prior to downlisting the species from endangered to threatened. In addition, the recovery plan should address (1) the demographic parameters of a self-sustaining parrot population within the United States in the context of minimum viable populations to maintain the adaptive potential of the species (in light of threats such as climate change), and (2) the ability of the U.S. population to naturally exchange individuals with populations in Mexico in terms of effective migrants per generation. Discussion of these parameters in the recovery plan is critical because species whose genetic health remains dependent on translocations are considered “intensively managed,” which is a more precarious conservation status than “self-sustaining” or “conservation-dependent” (an otherwise self-sustaining species for which continued efforts are required to limit human-caused mortality).</p>	<p>Once we have a better estimate of the current thick-billed parrot population and distribution as well as other other information needs, we can use this information to develop more measurable downlisting and delisting Recovery Criteria.</p>

Commenter	Affiliation	Comment	Response
Eva Lee Sargent	Director, Southwest Program Defenders of Wildlife 110 S. Church Ave. Suite 4292 Tucson, AZ 85701 esargent@defenders.org	<p>Defenders agrees that the first priority for the conservation of the thick-billed parrots is to protect and expand populations in Mexico. However, the US Fish and Wildlife Service (Service) has a statutory duty to recover the species within the United States, and the draft recovery plan is deficient in developing and articulating plans to do so.</p> <p>In Section 2(a)(3) of the Endangered Species Act (ESA), Congress found that threatened and endangered species “are of esthetic, ecological, educational, historical, recreational, and scientific value to the Nation and its people.” Therefore, the ESA rightfully emphasizes recovery within the US, because species which are extirpated can no longer provide these values to the nation. Furthermore, in setting recovery goals and objectives for listed species, the FWS must consider the status of a species throughout its entire range – recovery in the US cannot be shortchanged merely because a species is more plentiful in another nation (<i>Defenders of Wildlife v. Babbitt</i>, 958 F.Supp. 670, 684-85 (D.D.C. 1997)).</p> <p>The establishment of U.S. populations provides insurance against stochastic catastrophes in the small Mexican populations, affords a higher degree of protection to both the species and its habitat than is available in Mexico, and provides additional habitat. Also, populations at the edge of a species’ range are particularly important in maintaining genetic diversity and evolutionary potential (Channell, R. and M.V. Lomolino. 2000. <i>Dynamic biogeography and conservation of endangered species</i>. <i>Nature</i> 403:84-86).</p> <p>Recovery plan should include a downlisting criterion to establish at least one population in the U.S. The plan should include a detailed reintroduction strategy utilizing the offspring of a captive population which is established specifically for that purpose. The reintroduction protocols can improve upon past efforts by using birds specifically trained and conditioned for release, raising the birds in a flock environment,</p>	<p>The Defenders of Wildlife comments are similar to the Society for Conservation Biology comments. Please see our response to the Society for Conservation Biology comments.</p>

Commenter	Affiliation	Comment	Response
Eva Lee Sargent (continued)		releasing more birds at once, and using artificial nests to supplement natural nesting sites. The ability of thick-billed parrots to occupy their former range in the United States could also be boosted by concrete plans to map and protect cross border corridors, and to map and protect habitat in the U.S. The recovery planning team and their Mexican collaborators should also investigate opportunities to release thick-billed parrots into suitable habitat directly adjacent to the U.S./Mexico border, increasing the likelihood that birds will disperse naturally into the U.S.	

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Chris Biro	Bird Recovery International PO Box 295 Rodeo, NM 88056 chris@libertywings.com	<p>Reintroductions can be more successful and less expensive using techniques he and others have pioneered.</p> <p>Page one and two outline a plan which is primarily based in Mexico...working through Mexican partners limits US participation and quality control of data. We feel the project should have a component on US soil to allow for rigorous control and scientific study as is possible in the United States. US based study can give researchers and students simplified access and improved safety while they gain scientific knowledge in a variety of areas of release work and do so via working with the US government and the English language. There is also a sizable Thick-billed population already in captivity in the US, offering a genetic diversity that may already be lost in Mexico but maintained in the US. There are decades old US held captive birds whose genes have been sequestered during their captive care. Also, Mexico has a history of parrot smuggling, bribery, and lax enforcement of parrot conservation laws which do not come into play in the United States. (Guzman et al; 2007)</p> <p>Page three through five outline species recovery without captive breed and release. We believe that captive breed and release of parrots has been shown to be successful since Snyder and should be part of species recovery. Regarding another New World species, Brightsmith explains that the Scarlet Macaw can have 96% annual survival rates after an astonishing 74% first year survival. (Brightsmith et al 2005.) And obviously, the successful feral populations of parrots in California, New England, etc, show that parrots from captivity can do quite well in the US. We believe that a captive breed and release program could be economical using BRI methods, where minimum staff and caging are required, especially if much of the breeding is done through partners. We also do not wish to see the loss of captive US thick-billed genetics, many in private hands and currently unmonitored. Such bird's genetics may be important to preventing inbreeding depression. Establishing a US breeding colony, and working to get current keepers licensed in a friendly (not punitive or we'll</p>	<p>While we acknowledge the advances in techniques that have lead to more successful reintroductions within the last 20 years, we are not proposing reintroductions in United States at this time in the Sky Islands of Arizona and New Mexico. The continued drought and recent high-intensity fires have likely reduced food availability since the thick-billed parrot reintroductions of the late 1980s and early 1990s. We believe attempting a reintroduction in historical U.S. habitat under current habitat conditions and predictions of further habitat reduction through future climate change would be less successful and more costly than supporting conservation measures in Mexico. We have included additional justification for this decision in the recovery plan addendum.</p>

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		<p>never find the birds) capacity, is something BRI could do. As BRI is not a major institution with lots of overhead, we could work inexpensively on a dedicated site as has been done with the demonstration flocks of macaws and conures.</p> <p>Page 17 addresses land issue in Southeastern Arizona. Minimal conflict potential with human populations in the area. "Mature high-elevation conifer forests in southeastern Arizona exist on several mountain ranges, and virtually all of these areas are Federal lands, with most under the jurisdiction of the Coronado National Forest (U.S. Forest Service 2011). These forests face low development pressures as they are primarily managed for their recreation and watershed values, with no active timbering..." We want to highlight that the geography of the situation creates an opportunity: A lack of land use conflict, which would make breed and release a simple process. Unlike wolf release adjacent to ranch land, or nesting of endangered birds on private land, we do not anticipate economic conflicts caused by released birds. Page 20 illustrates that there is already information to establish nesting box locations and dimensions for captive bred and captive-release Thick-billeds to encourage nesting a easily monitored sites. "Selectivity has been demonstrated for nest size preferences, including the internal diameter of the cavity, entrance width, and entrance height above ground."</p> <p>Page 21 offers location of closest nesting Mexican thick-billed sites to US, only 50 miles from US border. We may want to select a release site that is farther from this to isolate any domestic raised and released birds from the nearest wild populations to better evaluate the success of the program. The Snyder project's results were somewhat blurred due to uncertainty about if the released birds joined wild flocks in Mexico or not. This could easily be avoided by selecting initial sites farther away from wild flocks. Page 22 Indicates the US Arizona habitat has not been subject to logging to the extent Mexico habitat has suffered. Thus US habitat seems more suitable for Thick-billeds at this time due to increased numbers of mature pine trees, increasing potential nest site and food resources. Page 24 Indicates the initial decline of US Thick-billeds as primarily from shooting</p>	

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Chris Biro (continued)		<p>so if that is controlled then they should do well in the US again. "Disappearance of the thick-billed parrot from the U.S. has been attributed to excessive shooting." Unlike habitat degradation, shooting can be prevented through education and does not pre-empt survival of release animals. Pages 26-27 again state that the US has no authority in Mexico and only has limited authority to restrict persons of US jurisdiction from engaging in commercial transport or sale of Thick-billeds in foreign commerce and to carry out programs for the conservation of the species." The U.S. has little authority to implement actions needed to recover species outside its borders, especially when recovery requires the employment of laws and regulations. The main threat to the parrot in Mexico is habitat destruction, with illegal capture for the pet trade being a secondary threat. The powers that the USFWS can employ in this regard are limited..."</p> <p>Page 27 states that thick-billeds are threatened due to the decreasing size of old growth forest in Mexican habitat. It seems reasonable to consider the healthier US forests as better habitat at this time of which a domestic breeding program could be instrumental without harming the remaining low numbered Mexican populations. "Large areas of old-growth forest are no longer found in the Sierra Madre Occidental and as the average age of trees and conifer forest decreases, so do parrot nesting sites and food resources. The reduced seed production in these younger forests is accompanied by an increase in the frequency of sterile cones, further exacerbating the inadequate food supply (Monterrubio-Rico and Enkerlin-Hoeflich 2004, Monterrubio-Rico et al. 2006). Thus, the thick-billed parrot is threatened by small population size and the low number of breeding pairs in the remaining old-growth and mature forests." Responding to page 31: Estimates for how many birds would need to be released, requiring the raising and behavioral preparation of domestically raised birds are extremely high in number. We presume this high estimate is due to the high loss rate in previous projects. With our current near zero loss rate we could achieve dramatically better results with far fewer individuals. As previously mentioned, there is a US population of these</p>	

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Chris Biro (continued)		<p>birds in zoos and private hands and simple DNA analysis could show how diverse this population is and if it is suitable for breeding. This would be the first goal of our pilot project, to demonstrate that we can produce high survival rates with minimal man power. If the zoo population was managed effectively so all breedable birds participated breeding programs run by experienced breeders, then this number of birds should easily produce enough birds for BRI to successfully establish populations within historic US habitat and at minimal costs and impact on Mexican wild populations compared to translocation.</p> <p>"Snyder et al. (1994) conclude that establishment of a viable wild population using captive-bred birds would necessitate the rearing, behavioral preparation, and release of large numbers of individuals, perhaps in the thousands. Currently, the Association of Zoos and Aquarium facilities hold approximately 95 birds (S. Healy, Sacramento Zoo, pers. comm. 2012). Using wild-caught birds with wild behavioral skills intact would require less funding and fewer individuals." Page 31 also addresses the disease issue. If disease transmission is of concern, then hatching eggs for release away from the breeding colony (and the use of crèche rearing, puppets, and audio-video recordings etc. for proper imprinting) would break the infection cycle. Page 31 indicates troubles with translocations due to far ranging flight abilities of thick-billed allowing them to easily return to the original locations, suggesting that domestically raised and prepared birds are potentially more likely to remain in the areas selected. It is our experience that birds will fly back many miles to return home if they have developed navigation skills, and agree that this highly migratory species could fly home.</p>	

Commenter	Affiliation	Comment	Response
<p>Ruben Marroquin Flores PhD</p>	<p>Consultor en Sostenibilidad Especialista en Restauracion Ecologica rumarroquin@gmail.com http:zzwww.rubenmarroquin.com off. 01 (81) 83063562 cel 044/045 8186853035</p>	<p>Translated from Spanish: I have worked in the area of el ejido Tutuaca. Villagers are concerned about the state of health of the parrot nests. Parrots that nested in Vallecillo and Yahuirachi are no longer present. A long-term tree restoration program is needed in the area.</p> <p>Villagers say Imperial woodpeckers were very common in the area of Cebadillas in 1960. They commented that Imperial woodpeckers were very easy to identify by its call, this bird is very vocal and loud. They also comment on how in olden times they chased Mexican Wolves from their cattle corrals by lighting bonfires at night.</p> <p>People can no longer rely on logging to earn a living because accessible areas have been harvested.</p> <p>This issue is of vital importance, since it is necessary to implement serious silvicultural management of natural regeneration as soon as possible, and see some other forms of artificial regeneration with key species, for specific purposes; it can be social, economic or environmental. People are still marking trees to cut down, but there are communities that currently have no trees to cut. The forest industry there was extraordinary in the level of exploitation of this resource, timber companies advancing like amoebae devouring the forest in the interior and large settlements around their sawmills worked overtime, and when wood was scarce the sawmill, with its settlement, would move and re-establish itself in a new site. And this leads us to the current situation.</p> <p>There is an agreement in the protected Natural Area for the payment of environmental services to the people of the ejido in exchange for preserving and not touching the area, perhaps the first in the country. In 2013, this Agreement terminates. The people in the area are good, the area is not very accessible, and the people are very distrusting of outsiders. Working with the management to renew the agreement for conservation would take some time and much effort, due mainly to the scarcity of wood, moreover, forests are very deteriorated. It will be necessary to consider other forms</p>	<p>We included that excessive logging and lack of enforcement of environmental laws has resulted in continuing destruction of occupied parrot habitat. Existing agreements for payment of environmental services to members of ejidos in exchange for preserving habitat can expire and are at risk of not being renewed, because of limited funding, forest deterioration, or the community's desire to harvest wood. Logging is the main form of income in some communities and forests have been overharvested to the extent that wood is scarce. Other forms of economic development are needed for these communities.</p>
		<p>of economic development to the communities before people there will sign a new convention on environmental services. Children aspire to be logging truck operators when they get older. This trade is the most profitable in the area although at this time, the smaller wood has become increasingly less profitable. Teachers in schools there do what they can, they go up and down to the communities in the mountains as they can. The school education level is extremely poor.</p>	

Commenter	Affiliation	Comment	Response
Tom Waddell	tewadel@hotmail.com	<p>"...It was my understanding that the reason this bird cannot be recovered in the US is that the pine cones here open relatively fast so food is only available for a short period of time. In Mexico the cones of similiar species of pine open much slower and it provides a food source over a longer period of time.</p> <p>One other concern is parrot use of water. They do not like to get on the ground to water and prefer a stream with a water fall. They will drink at the top of the fall as it gives them to most successful escape option from an avian attack which is to drop down below the attack ark.</p> <p>Be sure to review the last attempt effort in SE Arizona."</p>	<p>We included that the U.S. habitat may not have adequate food resources throughout year due to lack of available cones throughout the breeding season. We provided additional information on the Arizona releases in the late 1980s and early 1990s.</p>
Elizabeth T. Woodin	President, Board Arizona Heritage Alliance	<p>"I had the good fortune to see in the " wild" at the release in 1994 (?) in the Chiricauhuas near Noël and Helen Snyder's place when I was on the Game and Fish Commission. It was sad that the birds were so manipulated the day before and had to carry backpacks which were a continual distraction to them. I was not surprised that the released birds were wiped out by raptors in short order. I hope to read protocols for future releases that give the birds a chance to survive i.e. no backpacks. I would think that today some sort of implanted device would work if it is implanted well before the release. In reality even that is not necessary as they are so noisy and never seem to be quiet. Imping and blood sampling is fine but well in advance, not twelve hours before release. I was so disappointed by that release. I have never forgotten the feeling of doom for that flock. Worse, I was correct.</p> <p>It should not be so hard to release a flock of thick-bills successfully. Successful flock creation and timing are all important but that can be chosen carefully so it is not in the raptor migration path."</p>	<p>Bird mortality in past releases was caused by a number of factors, including lack of physical fitness, flocking behavior, experience evading aerial predators, and food. Disease may have contributed to the weakened condition of some birds. Most of the birds killed by raptors were weakened or inexperienced, making them prime targets.</p>
Jean Public	usacitizen1@live.com	<p>Hunters, pet stores that sell birds, and developers should be taxed to fund recovery of this species. Supports recovery.</p>	