PECE EVALUATION

RIO GRANDE CUTTHROAT TROUT CONSERVATION AGREEMENT AND CONSERVATION STRATEGY

AND

VERMEJO RANCH CANDIDATE CONSERVATION AGREEMENT WITH ASSURANCES

26 August 2014

Introduction

This document represents the U.S. Fish and Wildlife Service's (Service) completed analysis for the *Policy for Evaluation of Conservation Efforts When Making Listing Decisions* (PECE) (68 FR 15100) under the Endangered Species Act of 1973, as amended (ESA), for two separate conservation efforts for the Rio Grande cutthroat trout. The first formalized conservation effort is a rangewide, multiagency program outlined in the Rio Grande Cutthroat Trout Conservation Agreement (CA) and Conservation Strategy (CS) that describes the cooperative efforts of the parties to develop and implement the necessary conservation measures for the Rio Grande cutthroat trout to have sufficient resiliency, representation, and redundancy to provide for long-term viability. The second formalized conservation effort is the Candidate Conservation Agreement with Assurances for Vermejo Park Ranch (Vermejo CCAA). The goal of the Vermejo CCAA is to facilitate and promote the conservation and restoration of Rio Grande cutthroat trout on non-Federal lands. We analyzed the specific conservation actions that have been identified in each of the formalized conservation efforts. Using the PECE we determined whether we can rely on these future actions in our listing determination.

The purpose of PECE is to ensure consistent and adequate evaluation of recently formalized conservation efforts when making listing decisions. The policy provides guidance on how to evaluate conservation efforts that have not yet been implemented or have not yet demonstrated effectiveness. The evaluation focuses on the certainty that the future conservation efforts will be implemented and effective. The policy reviews nine criteria for evaluating the certainty of implementation and six criteria for evaluating the certainty of effectiveness for conservation efforts. The criteria to be evaluated are:

The certainty that the conservation effort will be <u>implemented</u>:

> 1. The conservation effort, the parties to the agreement or plan who will implement the effort, and the staffing, funding level, funding source, and other resources necessary to implement the effort are identified.
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> 2. The legal authority of the parties to the agreement or plan to implement the formalized conservation effort, and the commitment to proceed with the conservation effort are described.

3. The legal procedural requirements (e.g., environmental review) necessary to implement the effort are described, and information is provided indicating that fulfillment of these requirements does not preclude commitment to the effort.

4. Authorizations (e.g., permits, landowner permission) necessary to implement the conservation effort are identified, and a high level of certainty is provided that the parties to the agreement or plan who will implement the effort will obtain these authorizations.

5. The type and level of voluntary participation (e.g., number of landowners allowing entry to their land, or number of participants agreeing to change management practices and acreage involved) necessary to implement the conservation effort is identified, and a high level of certainty is provided that the parties to the agreement or plan who will implement the conservation effort will obtain that level of voluntary participation (e.g., an explanation of how incentives to be provided will result in the necessary level of voluntary participation).

6. Regulatory mechanisms (e.g., laws, regulations, ordinances) necessary to implement the conservation effort are in place.

7. A high level of certainty is provided that the parties to the agreement or plan who will implement the conservation effort will obtain the necessary funding.

8. An implementation schedule (including incremental completion dates) for the conservation effort is provided.

9. The conservation agreement or plan that includes the conservation effort is approved by all parties to the agreement or plan.

The certainty that the conservation effort will be effective:

10. The nature and extent of threats being addressed by the conservation effort are described, and how the conservation effort reduces the threats is described.

11. Explicit incremental objectives for the conservation effort and dates for achieving them are stated.

12. The steps necessary to implement the conservation effort are identified in detail.

13. Quantifiable, scientifically valid parameters that will demonstrate achievement of objectives, and standards for these parameters by which progress will be measured, are identified.

14. Provisions for monitoring and reporting progress on implementation (based on compliance with the implementation schedule) and effectiveness (based on evaluation of quantifiable parameters) of the conservation effort are provided.

15. Principles of adaptive management are incorporated.

These criteria are not considered comprehensive evaluation criteria. The certainty of implementation and effectiveness of a formalized conservation effort may also depend on species-specific, habitat-specific, location-specific, and effort-specific factors. We consider all appropriate factors in evaluating formalized conservation efforts. The specific circumstances will also determine the amount of information necessary to satisfy these criteria.

To conclude that a formalized conservation effort may contribute to a basis for not listing a species or for listing a species as threatened rather than endangered, we must find that the conservation effort is sufficiently certain to be implemented and effective so as to have contributed to the elimination or adequate reduction of one or more factors contributing to the species being considered as threatened or endangered. An agreement or plan may put in place one conservation effort that is designed to address the primary threats to the species, or may contain numerous conservation efforts, not all of which are sufficiently certain to be implemented and effective. Any conservation effort that is not sufficiently certain to be implemented and effective cannot be considered in the Service's listing determination. Regardless of the adoption of a conservation agreement or plan, however, if the best available scientific and commercial data indicate that the species meets the definition of "endangered species" or "threatened species" at the time of the listing decision, then we must proceed with appropriate rule-making activity under section 4 of the ESA.

Our PECE defines conservation efforts to as specific actions, activities, or programs designed to eliminate or reduce threats or otherwise improve the status of a species. Conservation efforts may involve restoration, enhancement, maintenance, or protection of habitat; reduction of mortality or injury; or other beneficial actions (68 FR 15113). Formalized conservation efforts are defined as conservation efforts identified in a conservation agreement, conservation plan, management plan, or similar document. An agreement or plan may contain numerous conservation efforts (68 FR 15113). The two formalized conservation efforts evaluated here establish conservation programs for the Rio Grande cutthroat trout that will implement a variety of actions to improve the overall status of the subspecies.

This document describes our evaluation of the certainty of implementation and effectiveness of the conservation efforts outlined in the CA/CS and Vermejo CCAA for the Rio Grande cutthroat trout. We are evaluating the CA/CS as one formalized conservation effort for the Rio Grande cutthroat trout—that is, the CA/CS are not viewed as separate formalized conservation efforts because the Conservation Strategy implements the Conservation Agreement. The Conservation Agreement establishes the structure within which the parties will implement conservation measures, and the Conservation Strategy identifies the specific conservation measures that the parties will enact to reduce the threats to the Rio Grande cutthroat trout. Where appropriate in the analysis, we have considered the certainty as related to specific conservation measures outlined in the CA/CS. Additionally, the Vermejo CCAA is a second, separate formalized conservation effort for the Rio Grande cutthroat trout.

PECE ANALYSIS – Conservation Agreement and Conservation Strategy

Background

In the early 2000s, the states of Colorado and New Mexico came together to coordinate ongoing conservation efforts for the Rio Grande cutthroat trout. The initial Conservation Agreement for the Range-Wide Preservation and Management of the Rio Grande Cutthroat Trout (Conservation Team 2003) was signed in 2003, which defined the shared goals and strategies for the conservation and restoration of the subspecies. Signatories included the New Mexico Department of Game and Fish (NMDGF), Colorado Division of Wildlife (now Colorado Parks and Wildlife (CPW)), US Forest Service (Forest Service), US Fish and Wildlife Service (Service), National Park Service (NPS), Bureau of Land Management (BLM), Mescalero Apache Nation, and Jicarilla Apache Nation. One of the tasks included in the Conservation Agreement was the development of a Conservation Strategy to establish a multi-agency program to guide conservation actions for the Rio Grande cutthroat trout. The Conservation Agreement was renewed in 2009 and again in 2013, when the Conservation Strategy was approved alongside the Conservation Agreement.

The CA/CS describe the cooperative efforts of the parties to develop and implement the necessary conservation measures for the Rio Grande cutthroat trout to have sufficient resiliency, representation, and redundancy to provide for long-term viability. Conservation measures include:

1. Identify and characterize all Rio Grande cutthroat trout conservation populations and occupied habitat. Characterization includes gathering data on Rio Grande cutthroat trout density, length of occupied habitat, genetic status, and habitat quality.
2. Secure and enhance conservation populations.
3. Restore populations.
4. Secure and enhance watershed conditions.
5. Public outreach.
6. Data sharing.
7. Coordination.

One of the most significant conservation measures is the commitment by the parties to restore between 11 and 20 new populations of Rio Grande cutthroat trout rangewide throughout the 10-year life of the CA/CS. The CA/CS may be renewed at the end of the 10-year term. Some of the conservation measures included in this conservation effort have already been implemented or are ongoing measures, which would not necessarily require a PECE analysis to include these measures in our listing decision. However, we have including all the conservation measures in this analysis to confirm it is appropriate to consider any future voluntary conservation efforts. As a result, some of the conclusions of the analysis under the PECE criteria are obvious because of historical and ongoing successful implementation of the conservation efforts.

Certainty of Implementation

1. **The conservation effort, the parties to the agreement or plan who will implement the effort, and the staffing, funding level, funding source, and other resources necessary to implement the effort are identified.**

Conservation effort: The CA/CS is an agreement among the nine signatory organizations to ensure that Rio Grande cutthroat trout populations are restored and maintained across its range. These conservation measures within the agreement are not required by law but are voluntary commitments to manage land, water, and fisheries resources consistent with the objectives of the Conservation Strategy. The Conservation Strategy, developed per the Conservation Agreement and approved with the 2013 renewal of the Conservation Agreement, clearly outlines the conservation measures to be taken for the conservation of the Rio Grande cutthroat trout. The Conservation Agreement provided the framework necessary for the development of the Conservation Strategy. Conservation measures detailed in the Conservation Strategy are organized under seven objectives which include identifying occupied waters, securing conservation populations, restoring the subspecies to extirpated streams, improving watershed conditions, public outreach, sharing of data, and coordination between agencies (Table 1). The conservation measures, and how they relate to the factors affecting the subspecies, are discussed in more detail under PECE Criterion 10.

Table 1: List of Conservation Measures in the Conservation Strategy for the Rio Grande Cutthroat Trout.

Conservation Measures
Objective 1: Identify and characterize all Rio Grande cutthroat trout conservation populations and occupied habitat.
Objective 2: Secure and enhance conservation populations: remove sympatric nonnative trout, construct and maintain in-channel downstream barriers
Objective 3: Restore populations. Maintain current conservation populations and establish new conservation populations.
Objective 4: Secure and enhance watershed conditions. Maintain a healthy watershed to lessen the effects of extreme events.
Objective 5: Public outreach. Develop and implement a public outreach effort specifically addressing Rio Grande cutthroat trout conservation.
Objective 6: Data sharing. Build and maintain the Rio Grande cutthroat trout database.
Objective 7: Coordination. Signatory agencies coordinate efforts toward a common goal.

Parties to the Agreement: The first Conservation Agreement for the Range-Wide Preservation and Management of the Rio Grande Cutthroat Trout was developed by the Rio Grande Cutthroat Trout Conservation Team (Conservation Team) and signed in 2003. The Conservation Team is made up of members from NMDGF, CPW, Forest Service, Service, NPS, BLM, and Jicarilla Apache Nation. The Mescalero Apache Nation joined the Conservation Team when the Conservation Agreement was renewed in 2009. In 2013 Taos Pueblo also signed the revised Conservation Agreement. This brings the total number of signatory organizations to 9.

NMDGF and CPW are the state agencies charged with conservation and management of Rio Grande cutthroat trout. These agencies have the authority to manage and restore populations throughout the subspecies' historical range. The Forest Service manages 59 percent of the land area occupied by Rio Grande cutthroat trout on the Santa Fe, Carson, and Rio Grande National Forests. The Service works with Tribes who are managing Rio Grande cutthroat trout on their lands; additionally, the Service contributes to the prioritization and planning of monitoring and restoration projects. NPS and BLM manage Rio Grande cutthroat trout populations on lands that they manage, and Mescalero Apache Nation, Jicarilla Apache Nation, and Taos Pueblo are working toward restoring conservation populations to their lands.

Funding: Here we discuss the funding level necessary to implement the conservation effort, and from what source. See criterion 7 for analysis of our certainty that the funding will be provided. Because this conservation effort includes a large variety of conservation measures to be implemented under the conservation plan over the next 10 years, and the type and location of work to be done will be determined annually, the exact funding level needed to implement the effort is not identified. However, because these actions are ongoing by the agencies, the amount of funding necessary may be estimated based on past expenditures.

NMDGF and CPW are state agencies with staff biologists dedicated to Rio Grande cutthroat trout management. Both states have demonstrated that management of the species is a priority, in part because the Rio Grande cutthroat trout is a native recreational species. The agencies demonstrated their commitment to Rio Grande cutthroat trout conservation before the first Conservation Agreement was signed by dedicating staffing positions and budget expenses; NMDGF has had a Rio Grande cutthroat trout biologist position since 1989 and recently hired an assistant for the program. Since 2006, NMDGF has expended about $300,000 per year on conservation and management of the subspecies, and funding levels are expected to remain equivalent in the future (Conservation Strategy, pp. 41–42). CPW has four staff members with Rio Grande cutthroat trout responsibility and expends approximately $100,000 annually on Rio Grande cutthroat trout management. Funding levels at CPW are also expected to remain constant (Conservation Strategy, p. 38). The Forest Service, BLM, and the Service have each expended many thousands of dollars in staff time and grants on Rio Grande cutthroat trout conservation. While agency funding is never guaranteed, these agencies have a demonstrated commitment to conservation of the subspecies, which began long before the subspecies became a candidate for listing under the ESA in 2008. Upon signing, the signatories agreed to commit resources in terms of personnel and operational funding to conservation activities to the extent possible. Details of funding allocation since 2002 may be found in Appendix A of the Conservation Strategy. We have high confidence that the organizations participating in the CA/CS will provide the necessary resources to carry out the conservation measures identified in the plans.

2. The legal authority of the parties to the agreement or plan to implement the formalized conservation effort, and the commitment to proceed with the conservation effort are described.

The Conservation Agreement includes a detailed description of the authority of the parties (Conservation Agreement, pp. 5–8). Briefly, NMDGF has the authority to manage fish and wildlife within the State of New Mexico to provide and maintain an adequate supply of game and fish within the State of New Mexico (NMSA 1978 17-1-1). CPW protects, preserves, enhances, and manages wildlife, fish, and their environments for the use, benefit, and enjoyment of the people of the State and its visitors (CPW Statutes 33-1-101). Sections 2 and 7 of the ESA allow the Service to enter into the Conservation Agreement and Strategy. The Santa Fe, Carson, and Rio Grande National Forest Land and Resource Management Plans provide guidance for all resource management activities on the forests and establish management standards and guidelines that ensure habitat is managed to provide for viable populations of existing native species. Fisheries management in the National Park System is directed by policy and guidelines that directs NPS to manage parks and monuments to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations. The Federal land Policy and Management Act (FLPMA, Section 307, 43 USC 1737), which provides overall direction to BLM for conservation and management of public lands, allows the BLM to participate in conservation agreements. Finally, the Tribes are sovereign nations that may enter into agreements with Federal agencies.

3. The legal procedural requirements (e.g., environmental review) necessary to implement the effort are described, and information is provided indicating that fulfillment of these requirements does not preclude commitment to the effort.

The Conservation Team considered the legal procedural requirements of the CA/CS before committing to the efforts. National Environmental Policy Act (NEPA) analyses will be conducted for Rio Grande cutthroat trout restoration on Federal lands or using Federal money (Conservation Agreement, p. 11). These analyses have already been conducted for all of the restoration projects completed to date, and we do not anticipate that this review will preclude the future restoration of conservation populations of Rio Grande cutthroat trout. Additionally, NMDGF must obtain approval from the New Mexico Water Quality Control Commission (NMAC 20.6.4.16) to use piscicides for nonnative trout removal. Approval by the New Mexico Water Quality Control Commission indicates that the proposed action complies with NMAC 20.6.4.16 and other applicable New Mexico water quality regulations. Application of a piscicide to a water of the United States in accordance with the Federal Insecticide, Fungicide, and Redenticide Act is not a pollutant under the Clean Water Act (70 FR 5093, 71, FR 68483, Fairhurst v. Hagener 422 F.3d 1146 (9th Cir. 2005)). We conclude that fulfillment of environmental requirements will not preclude participating Conservation Team members' abilities to complete these conservation measures.

4. Authorizations (e.g., permits, landowner permission) necessary to implement the conservation effort are identified, and a high level of certainty is provided that the parties to the agreement or plan who will implement the effort will obtain these authorizations.

We have a high level of certainty that the Conservation Team will obtain the necessary authorizations to implement the Conservation Agreement and Strategy. Sixty-three percent of land area occupied by Rio Grande cutthroat trout is federally managed by the signatories to the Conservation Agreement and Strategy (Forest Service, BLM, and NPS). Their participation in the Conservation Team and their history of authorizing stream restorations provide a high level of certainty they would continue to authorize stream restorations and habitat work pertaining to conservation measures identified in the Conservation Strategy. Several large-tract private landowners have already worked with the states to restore Rio Grande cutthroat trout to their lands (*e.g.*, Vermejo Park Ranch, LLC, Trinchera Ranch, and Ladder Ranch), and the states will continue to work to obtain similar authorizations with other landowners.

Additionally, the 10 Colorado Counties in the range of Rio Grande cutthroat trout have recently signed a Memorandum of Understanding (MOU) (Board of County Commissioners of Colorado Counties 2014) to support the efforts of the Conservation Team in implementing the CA/CS. The goal of the MOU is to increase the abundance and viability of the Rio Grande cutthroat trout rangewide. As such, the Counties will support the restoration efforts of the Conservation Team in Colorado. New Mexico Counties are currently considering signing a similar MOU in support of the CA/CS.

5. The type and level of voluntary participation (*e.g.* number of landowners allowing entry to their land, or number of participants agreeing to change timber management practices and acreage involved) necessary to implement the conservation effort is identified, and a high level of certainty is provided that the parties to the agreement or plan who will implement the conservation effort will obtain that level of voluntary participation (*e.g.* an explanation of how incentives to be provided will result in the necessary level of voluntary participation).

The conservation efforts will primarily be implemented on land owned or managed by the signatories. Sixty-three percent of occupied Rio Grande cutthroat trout habitat is on Federal land managed by signatories to the CA/CS. Therefore, much of the stream restoration work to be done is managed by parties to this agreement. Although participation in the Conservation Agreement and Strategy is voluntary, the agencies and several large-tract private landowners have been committed to Rio Grande cutthroat trout conservation and restoration for decades. Outside of public lands, there are 4 large tract private landowners committed to Rio Grande cutthroat trout conservation – Trinchera Ranch in Colorado, which is a 170,000-acre ranch protected by conservation easements, on which 132 kilometers (82 miles) of occupied Rio Grande cutthroat trout habitat have been restored or protected over the last 35 years (J. Alves, CPW, pers. comm. 2014); Cielo Vista Ranch, on which 66 kilometers (41 miles) of occupied Rio Grande cutthroat trout habitat have been restored or maintained (J. Alves, CPW, pers. comm. 2014); Vermejo Park Ranch in New Mexico, which is in the process of restoring 190 kilometers (118 miles) of habitat (for the PECE evaluation of the Vermejo CCAA see below); and the Ladder Ranch in southern New Mexico, on which the restoration of Las Animas Creek is currently occurring (NMDGF *et al.* 2014, entire). There are no

specific incentives for private landowners to participate in Rio Grande cutthroat trout conservation. However, we have a high level of certainty that the conservation measures described in the CA/CS will be accomplished on public land and on the large ranches where conservation is currently occurring. Outside of those areas, the Conservation Team will pursue restoration efforts on other private lands, but we do not have certainty regarding when and where those efforts may occur. Therefore, there is a high level of certainty that the land management agencies, as signatories to the Conservation Agreement and Strategy, will implement stream restorations and other conservation measures on their lands. Appendix A in the Conservation Strategy details work that has been ongoing over the last decade on public and private land throughout Rio Grande cutthroat trout habitat which demonstrates the ongoing commitment of the signatories to participate in this conservation effort.

6. Regulatory mechanisms (*e.g.*, laws, regulations, ordinances) necessary to implement the conservation effort are in place.

As discussed in criterion 2, the parties to the CA/CS have the legal and regulatory authority to implement the conservation measures.

7. A high level of certainty is provided that the parties to the agreement or plan who will implement the conservation effort will obtain the necessary funding.

Management of Rio Grande cutthroat trout has been ongoing for decades, and conservation of the subspecies is a high priority in both states, for conservation and recreational value. In New Mexico, NMDGF began investigating the apparent decline of Rio Grande cutthroat trout during the 1960s and 1970s. A Rio Grande cutthroat trout biologist position was created in 1989 and tasked to coordinate management and conservation efforts of the subspecies for the State. Restoring Rio Grande cutthroat trout to historical habitat requires a large amount of time and manpower, and under the guidance of the Rio Grande cutthroat trout biologist, numerous stream restorations, population surveys, genetic investigations, nonnative species removals, barrier constructions and maintenance, and wildfire rescues have been successfully implemented. The Conservation Agreement has been a catalyst to jumpstart State conservation efforts, underscoring the importance of Rio Grande cutthroat trout to managers and the public. From 2006 to 2012, NMDGF expended, on average, approximately $310,000 per year on conservation and management activities and $400,000 per year on Rio Grande cutthroat trout rearing at Seven Springs State Hatchery. Since 2002, 14 restoration projects have been initiated or completed under the guidance of New Mexico's Rio Grande cutthroat trout biologist (Conservation Strategy, Appendix A). In 2012, a second permanent position was assigned to provide full-time assistance with program activities. On the National Forests in New Mexico, over $1.5 million has been spent on habitat improvement projects, surveys, restorations, and genetic and disease monitoring. The National Forests in New Mexico contribute to conservation of the species by building and repairing barriers, population and habitat monitoring, maintenance and enhancement of pasture fences, non-native removal, and Rio Grande cutthroat trout education (Conservation Strategy, Appendix A).

In 1973, Colorado listed the Rio Grande cutthroat trout as a State threatened species. Recovery goals were established, and, after an 11-year period of conservation activities, the species was delisted in 1984. Rio Grande cutthroat trout is presently designated a species of special concern in

Colorado. Conservation activities have been ongoing since 1984, including population monitoring, restoration projects, broodstock development, genetic testing, barrier construction and habitat improvement (Conservation Strategy, Appendix A). From 2002 to 2011, CPW expended $792,000 on conservation and management activities. Colorado Parks and Wildlife employs an area Aquatic Biologist, and Rio Grande cutthroat trout management is a high priority of the position. Additionally, the Service's Partners for Wildlife Program, USFS, NPS, and BLM expended over $1.5 million on habitat improvement projects in Colorado. Since 2002, 4 restoration projects resulting in 5 new conservation populations have funded.

The state and Federal agencies participating in the CA/CS have already spent more than $10 million, collectively, over the past decade (Conservation Strategy, pp. 38–46). Because there is a high level of public interest in trout in general and Rio Grande cutthroat trout, specifically, the state agencies are motivated to continue conservation work on the species.

State funding of fisheries programs comes from their respective legislatures, fishing license sales, and Federal programs. The Federal Aid in Sport Fish Restoration Act provides Federal funds to the States for management and restoration of fish, and both Colorado and New Mexico receive these funds and use them for Rio Grande cutthroat trout management. Western Trout Initiative grants have been used to fund barrier construction, and Forest Service staff time and funds have been used toward conservation, as well. The Conservation Team will continue to pursue multiple sources of funds to complete CA/CS commitments.

The signature and implementation of the CA/CS make it even more likely that the parties to the agreement will continue to fund ongoing and future restoration projects, as well as the staff to plan, carry out, and monitor them. Detailed information on the past expenditures by the participating agencies is included in Appendix A in the Conservation Strategy. Therefore, because of the past history of funding Rio Grande cutthroat trout conservation projects, the additional commitment of the CA/CS, and the multiple funding sources, there is a high level of certainty that the state and Federal agencies participating in the Conservation Agreement and Strategy will continue to fund the conservation measures specified.

8. An implementation schedule (including incremental completion dates) for the conservation effort is provided.

The implementation schedule, which includes specific incremental completion dates, is clearly available and is included as Appendix B in the Conservation Strategy. It includes a one-year plan, which will be updated annually at the Annual Meeting and will become the Annual Work Plan. The Annual Meetings of the rangewide Conservation Team have been ongoing since the Conservation Agreement was first signed in 2003. All signatories to the CA/CS attend, share information, and plan work for the coming year. Members of the public and other interested parties may also attend. Appendix B also has a 10-year plan, which includes all of the measures to be accomplished over the 10-year life of the Conservation Agreement and Strategy. The Annual Work Plans will be adjusted as needed to meet the objectives specified in the 10-year plan. The Conservation Agreement and Strategy may be renewed after the current 10-year commitment. Given the prior history of the Conservation Team and the fact that the Conservation Agreement has already been renewed twice, we expect the CA/CS will be renewed in the future.

9. The conservation agreement or plan that includes the conservation effort is approved by all parties to the agreement or plan.

The Conservation Agreement and Strategy with New Mexico Department of Game and Fish, Colorado Division of Parks and Wildlife, U.S. Forest Service, U.S. Fish and Wildlife Service, Bureau of Land Management, National Park Service, Jicarilla Apache Nation, Mescalero Apache Nation, and Taos Pueblo was signed by all the parties by November 26, 2013.

Certainty of Effectiveness

10. The nature and extent of threats being addressed by the conservation effort are described, and how the conservation effort reduces the threats is described.

The CA/CS describes the nature of the specific threats being addressed and discusses how the strategy will act to reduce each threat. The CA/CS for Rio Grande Cutthroat Trout was designed to provide a framework for the long-term conservation of Rio Grande cutthroat trout by reducing threats (also referred to as risk factors) to the subspecies. The factors that put the subspecies at risk are described in the Service's *Species Status Assessment for the Rio Grande Cutthroat Trout* (2014, Chapter 4) and include small population sizes, hybridization and competition from nonnative trout, whirling disease, and the effects of climate change, including dewatering from drought, the effects of wildfire, and increased stream temperatures. These factors are discussed in detail in the CA/CS, and the conservation measures were developed to directly address them. We describe below how the conservation measures are designed to minimize the effects of these factors on the Rio Grande cutthroat trout. In addition, the conservation measures also serve to improve the overall status of the species by conducting extensive restoration efforts to restore new populations of the subspecies across its range. The CA/CS has a large influence across the range of the Rio Grande cutthroat trout. The subspecies occurs primarily on public lands; 63 percent of occupied land area is publicly owned, primarily by the Forest Service. Of the private land (36 percent of occupied land area is privately owned), several large ranches have been working with the states of Colorado and New Mexico to restore and maintain Rio Grande cutthroat trout on their land. Therefore, the conservation measures included in the Conservation Strategy will be applied to the majority of the range of the subspecies. Each of the conservation measures and how they address the risk factors to the subspecies are listed in Table 2 and summarized in the discussion below.

1. Identify and Characterize all Rio Grande Cutthroat Trout Conservation Populations and Occupied Habitat: Knowledge of the status of Rio Grande cutthroat trout populations is critical to effective conservation of the subspecies. The Conservation Strategy describes how known conservation populations will be monitored and how suspected new conservation populations will be confirmed genetically. Known populations will generally be monitored every 5 years. Streams to be visited each year will be determined at the Annual Coordination Meeting. In this way, changes in the status of individual Rio Grande cutthroat trout populations will be detected and considered when planning work for upcoming years.

2. Secure and Enhance Conservation Populations: This objective primarily addresses the risks of hybridization and competition with nonnative trout. To minimize the contact of nonnative trout

with Rio Grande cutthroat trout, fish barriers have been constructed where natural barriers did not already exist. These barrier prevent nonnative trout from dispersing upstream and invading stream reaches occupied by Rio Grande cutthroat. As a result, these barriers reduce the risk of hybridization and competition with nonnative trout. Over time these fish barriers can become compromised following flood events or due to aging, so onitoring their status and maintaining their integrity through active repairs is essential to the long-term security of these populations. The maintenance of fish barriers will continue under this conservation measure of the CA/CS. Certain Rio Grande cutthroat trout populations are sympatric with native trout but due to logistical constraints (*i.e.*, no suitable location for a downstream fish migration barrier exists) the population cannot be secured with a barrier. In these cases, this conservation measure entails periodic mechanical removal of nonnative trout species to suppress their populations and allow Rio Grande cutthroat populations to persist. Continuing this program of nonnative trout removal is included in this conservation measure and reduces the risks of populations being extirpated due to nonnative trout.

Additionally, this conservation measure addresses disease risks related to whirling disease. Approximately 88 percent of Rio Grande cutthroat trout conservation populations have very limited risk from whirling disease due to the lack of pathogens in the watershed or the presence of downstream fish migration barriers, which prevent whirling disease from being introduced by other trout. Streams at risk for whirling disease are tested, and if populations do become infected, methods have been developed to eradicate the disease; these methods include removing fish from the system and introducing disease-resistant *Tubifex tubifex* worms (the intermediate host for the myxosporean parasite, *Myxobolus cerebralis*, which causes whirling disease) for several years. Fewer than five Rio Grande cutthroat trout streams have been documented as infected with whirling disease rangewide, and none are known to be infected now. Monitoring for the presence of disease and responding appropriately if a population is a conservation measure under the CA/CS.

3. Restore Populations: This objective addresses the risk of extirpation from all of the risk factors and also serves to improve the overall status of the species through increasing the number of streams occupied by Rio Grande cutthroat trout. Populations throughout the 5 Geographic Management Units (GMUs) will be restored over the life of this Conservation Agreement and Strategy (Conservation Strategy pp. 5, 25–27). Restored populations will be free of nonnative trout species and secured by a downstream barrier. Establishing or maintaining populations among different GMUs will reduce the likelihood of the subspecies being eliminated by stochastic events, such as wildfire or stream drying. The restoration of long, complex stream sections is emphasized, which will provide the species refugia in the event of drought or changes in water temperatures. The Conservation Strategy describes the number of new populations to be restored in each GMU over the next 10 years. Rangewide, the plan calls for between 11 and 20 new populations to be restored within the historical range of Rio Grande cutthroat trout. These new populations are important to offset possible population extirpations from any of the factors that may reduce overall subspecies viability. The Conservation Team has an extensive history of population restoration, with 13 successful Rio Grande cutthroat trout population restorations since 2003 (Conservation Strategy, p. 21).

4. Secure and Enhance Watershed Conditions: This objective addresses the risks of wildfire, drought, increased water temperature, and land management. The maintenance of high quality Rio

Grande cutthroat trout habitat is important to the continued existence of this species. Protection of existing habitat and improvement of habitat, in certain areas, are vital components of maintaining and improving the resilience of populations in changing climatic conditions. Healthy watersheds can minimize incidence of fire, flooding, and reduce the severity of drought, increasing the likelihood Rio Grande cutthroat trout populations would survive these events. This conservation measure includes habitat measures such as protection and enhancement of riparian and instream habitat through grazing and timber management, monitoring habitat conditions, and including habitat protection in management plans. This conservation measure also directs the development and implementation of fire and drought contingency plans, which guide agency actions in the event of an imminent threat.

5. Public Outreach: This objective addresses the risks associated with angling and nonnative trout invasions. Public outreach is important to the conservation and management of the Rio Grande cutthroat trout. Because this species has recreational importance, angling regulations and outreach can be an effective fishery management tool to protect fish, if necessary. Fishing regulations in New Mexico and Colorado appropriately manage recreational angling. For example, many of the streams with Rio Grande cutthroat trout are "catch and release." Fish limits for those population that are not catch and release are 2 in New Mexico and 4 in Colorado per person per day. Making the public aware of the need not to release any other trout into streams helps reduce the risk of intentional introductions of nonnative trout into streams occupied by Rio Grande cutthroat trout.

6. Data Sharing: The maintenance and updating of the Rio Grande cutthroat trout database is crucial to subspecies management. All signatories to the agreement share data on population size, habitat size and quality, disease risk, nonnative species risk, and other important factors. Population trends and other analyses may be performed because this database is so comprehensive. This information management is an important part of the overall conservation program identified in the CA/CS and serves to improve the overall status of the species.

7. Coordination: Conservation efforts are maximized by information sharing and field coordination among the signatories. This includes a commitment to attend and contribute to an Annual Coordination Meeting, at which time information is shared and annual work plans are formulated. These coordination measures are an important part of the overall conservation program identified in the CA/CS and serves to improve the overall status of the species.

We have a high level of certainty that that these conservation measures will be effective at reducing the threats to and improving the overall status of the Rio Grande cutthroat trout.

Table 2. Risk factors addressed by conservation measures in the CA/CS. See the Conservation Strategy for a discussion of these factors (or threats). The numbers refer to the objectives in the CA/CS that identify the conservation measures.

Risk Factors	**Conservation Measures to Address the Factors**
Small population size	**2:** Secure and enhance conservation populations. Enhancing conservation populations will increase population sizes, reducing the risk of genetic effects of small population sizes.
Nonnative hybridizing trout	**2:** Secure and enhance conservation populations, **3:** Restore populations. These objectives include removing nonnative hybridizing trout from current populations and restoration areas, and **5:** Public outreach.
Nonnative competing trout	**2:** Secure and enhance conservation populations, **3:** Restore populations. These objectives include removing nonnative competing trout from current populations and restoration areas, and **5:** Public outreach..
Wildfire	**2:** Secure and enhance conservation populations, **3:** Restore populations, and **4:** Secure and enhance watershed conditions. Securing watershed conditions will help reduce the risk of wildfire and, if it occurs, reduce the effects of ash flow on the population. If the population survives, enhancing the conservation population will help improve conditions more quickly. Restoring populations provides the subspecies redundancy across its range.
Stream drying	**1**: Identify and characterize all Rio Grande cutthroat trout conservation populations and occupied habitat **, 2:** Secure and enhance conservation populations, **3:** Restore populations, and **4:** Secure and enhance watershed conditions. Characterizing populations includes gathering stream discharge information, which will allow the Conservation Team to assess which populations may be vulnerable to stream drying in the future. Securing watershed conditions will provide refugia during times of drought or low water so the population may survive. Enhancing populations and habitat will improve the resiliency of those populations to drought, and restoring populations will provide the subspecies redundancy across its range.
Disease	**1**: Identify and characterize all Rio Grande cutthroat trout conservation populations and occupied habitat, **2:** Secure and enhance conservation populations, and **6:** Data sharing. Monitoring of populations will allow whirling disease to be detected if a population is exposed, and sharing information regarding where whirling disease does occur allows managers to assess a population's risk of infection.
Increased water temperature	**1**: Identify and characterize all Rio Grande cutthroat trout conservation populations and occupied habitat, and **4:** Secure and enhance watershed conditions. Characterizing populations includes gathering water temperature information, which will allow the Conservation Team to assess which populations may be vulnerable to increased water temperature in the future. Often, watershed conditions may be improved to ameliorate the effects of warming air temperature; for example, riparian vegetation can provide shading.
Land management	**4:** Secure and enhance watershed conditions. Land management activities undertaken by the signatories will be designed to minimize effects to Rio Grande cutthroat trout.
Angling	**5:** Public outreach. Effective outreach will ensure anglers are aware of catch and release regulations and bag limits on Rio Grande cutthroat trout waters.

11. Explicit incremental objectives for the conservation effort and dates for achieving them are stated.

We analyzed if explicit incremental objectives for the conservation effort and dates for achieving components of the conservation effort were stated. This criterion is designed to ensure that, if information is incomplete, implementation can nevertheless proceed to move towards incremental objectives until the additional information is available, at which time implementation can be modified in accordance with the new information (68 FR 15103, 15105).

The Conservation Strategy includes one-year and ten-year plans (Conservation Strategy, pp. 47–53). The intent of the one-year plan is to step down the overall goals of the strategy into achievable goals. At each Annual Coordination Meeting an Annual Work Plan will be developed, which becomes the next year's one-year plan. These one-year plans will ensure progress toward the full completion of the ten-year plan. The exact schedule and timing of stream restorations cannot be planned farther in advance, as opportunities and challenges arise that affect the timing and location of restorations. The Conservation Team is responsible for determining which stream restoration opportunities in a GMU will most benefit the species and provide resiliency, redundancy, and representation across the landscape. We have a high level of certainty that this criterion has been met.

12. The steps necessary to implement the conservation effort are identified in detail.

We determined if the steps necessary to implement the CA/CS were identified in detail. The first step in implementing the Conservation Agreement, which was originally signed in 2003, was to form the Conservation Team and begin holding annual meetings. The Team was formed and has been meeting every year since 2003. Next, the Rio Grande cutthroat trout database was developed in 2005 to house population and landscape information rangewide. The development of the Conservation Strategy was the next step in implementation of the Conservation Agreement, and it was completed in 2013.

To implement the Conservation Strategy, at the Annual Meetings the Conservation Team will identify and prioritize stream restoration projects; these projects include Rio Grande cutthroat trout reintroductions, nonnative trout removals, instream habitat work, or riparian management. Also at these meetings, the Conservation Team will document progress toward Strategy goals and objectives, develop range-wide priorities, review the annual conservation work plans developed for each state, and coordinate tasks and agency resources to most effectively implement the work plan. Updates to the RGCT GIS will also occur on an annual basis. Appropriate permissions, including those from the landowner, compliance with NEPA and other federal laws, and water quality certification, will be obtained. We have concluded that the steps necessary to implement the conservation measures have been identified.

13. Quantifiable, scientifically valid parameters that will demonstrate achievement of objectives, and standards for these parameters by which progress will be measured, are identified.

The objectives of the CA/CS are based on population size and status, which is best assessed through a population model. The conservation status of the Rio Grande cutthroat trout, like other inland cutthroat trout, was traditionally evaluated with a Population Health Index (Alves 2008, pp. 6–7). Limitations of that approach led to a shift toward modeling population persistence with a Bayesian Network (BN), which is a flexible framework better suited for incorporating new information as it becomes available (Roberts *et al.* 2013, entire; Rogers 2013, entire). BN models are useful because they support logical reasoning based on existing knowledge, and they are able to incorporate uncertainty (Marcot *et al.* 2001; Newton *et al.* 2007; Peterson *et al.* 2013). Furthermore, BN models have already been used in previous applications to explore the threat of climate change (Jay *et al.* 2011) and address various fisheries management decisions (Peterson *et al.* 2008; Peterson *et al.* 2013; Roberts *et al.* 2013). The goal for the development of the initial BN model for Rio Grande cutthroat trout was to mimic the Population Health Index by evaluating the probability of future persistence in the short term (over the next 30 years) of individual Rio Grande cutthroat trout populations given specific threats to the subspecies. This initial Rio Grande cutthroat trout BN model used in the Conservation Strategy was originally developed for a sister taxa, the Colorado River cutthroat trout. The initial model uses Rio Grande cutthroat trout specific data and input from resource managers.

The initial BN model is used in the Conservation Strategy to determine the resiliency of Rio Grande cutthroat trout populations, although it has some limitations. While this model takes into account three factors – stream length, stream temperature, and the presence of nonnative trout species – the only factors driving the model are stream length and nonnative species, because the high elevation streams inhabit by Rio Grande cutthroat trout are generally cold enough that the predicted increase in temperatures from climate change are unlikely to affect the subspecies to a large extent. Further, the model uses a shorter optimal minimum stream length than has been used previously to evaluate population resilience (4.8 miles here versus 6.0 miles in previous evaluations). The Conservation Strategy relies on the shorter stream length because the BN is largely modeled after the methods used in the BN for the Colorado River cutthroat trout. In the future, BN modeling efforts will incorporate a more robust analysis of how stream length relates to population resilience. A larger BN modeling effort is currently being developed that will incorporate many more factors affecting the subspecies in both positive and negative ways, and this model will be peer reviewed. When available, it will be used in the Conservation Strategy in place of the initial model currently used.

Additionally, there are standard population monitoring protocols used by the Conservation Team members. Information is collected regarding fish density, length of occupied habitat, habitat quality, nonnative trout presence, and other factors. All of this information is entered into the rangewide database to track population and species trends. This monitoring shows whether population restoration has been successful, the growth rate of the population, and whether recent events (*i.e.* drought, wildfire) have affected the population.

Because there will be comprehensive monitoring of populations, the limitations of the current model have been identified, and a more complex model that will be peer reviewed is in development and will be used to evaluate population resiliency, we have a high level of certainty that this criterion has been met.

14. Provisions for monitoring and reporting progress on implementation (based on compliance with the implementation schedule) and effectiveness (based on evaluation of quantifiable parameters) of the conservation effort are provided.

Monitoring will be of two types: effectiveness and implementation. The Conservation Strategy outlines effectiveness monitoring of Rio Grande cutthroat trout populations to determine if the stream restorations and reintroductions are effective (Conservation Strategy, pp. 31, 47). All Rio Grande cutthroat trout populations will generally be monitored about every five years, and those that have been reintroduced or received restoration efforts will be monitored annually for several years to determine if actions were effective at restoring and maintaining populations, primarily measured by trends in population density. Monitoring at these levels has been occurring for the last 10 years, since the first Conservation Agreement was signed. Streams to be monitored are included in Appendix B of the Conservation Strategy. Effectiveness monitoring will also consist of assessing the effectiveness of the conservation actions that have been completed to date compared to the previous year's annual work plan.

Implementation monitoring will consist of assessing the status and progress of all conservation actions identified in the Conservation Strategy. This type of monitoring will be documented at the Annual Meeting to ensure the Conservation Team is making expected progress and will be documented in the annual report. The annual report will consist of the minutes of the Annual Coordination Meeting, encompassing the discussion regarding status of the species and actions accomplished; an updated Summary of Activities table, which shows the past year's accomplishments; results of the annually updated RGCT database; and the Annual Work Plan, which includes proposed or planned activities for the next field season.

In light of the effectiveness and implementation monitoring and the report that will be generated annually detailing the results, we conclude that there are provisions for monitoring in the Conservation Agreement and Conservation Strategy.

15. Principles of adaptive management are incorporated.

Adaptive management is a flexible decision making process that can be adjusted in the face of uncertainties as outcomes from management actions and other events become better understood (Williams and Brown 2012). Principles of adaptive management include iterative decision making, feedback between monitoring and decisions, and explicit characterization of uncertainty. The CA/CS embraces these principles in the following ways:

1) Iterative decision making: The CA/CS calls for an Annual Meeting of the rangewide Conservation Team, at which the previous year's accomplishments and challenges are reviewed and the following year's Work Plan is formulated. The Conservation Strategy, while explicit in its goals, implements a program that allows for much flexibility in where and how the population goals for

Rio Grande cutthroat trout are met. If challenges were encountered, the Team will review the outcome and make changes when creating the new Work Plan. The Annual Coordination Meeting serves as the forum for adapting conservation measures as necessary to changing conditions and scientific approaches. Further, Colorado Division of Parks and Wildlife has funded the development of a complex BN population model to determine population resilience. The results of this model will guide the evaluation of populations and selection of restoration and reintroduction activities. At the Annual Meeting of the rangewide Conservation Team, new information and analyses may be used to inform and guide upcoming conservation efforts. The Conservation Team has the ability to respond to changing conditions and updates in scientific approaches.

2) Feedback between monitoring and decisions: As above, the Annual Coordination Meeting serves as the vehicle to review monitoring results before making decisions about future work to be performed. Results of population monitoring will be reviewed to determine if habitat restoration work or continued stocking need to be conducted, barrier monitoring will inform the Conservation Team and to which sites need maintenance, and the effects of any stochastic events (fire, drought) will be reviewed to determine where challenges and opportunities arose.

3) Explicit characterization of uncertainty: The CA/CS clearly states that uncertainty surrounds the population modeling portion of the conservation efforts. The current model being used, as discussed above, is based on few factors affecting the subspecies and does not likely reflect reality. The BN model being developed will incorporate many more factors and is expected to more closely reflect reality, although there is significant uncertainty in some of the factors included in the model, such as the rate of nonnative trout invasion.

Based on the above, we conclude that the Conservation Agreement and Conservation Strategy incorporate principles of adaptive management.

Conclusion

In summary, using the criteria in PECE (68 FR 15115, March 28, 2003), we evaluated the certainty of implementation and effectiveness of the conservation measures identified in the Rio Grande Cutthroat Trout Conservation Agreement and Conservation Strategy. We have determined that the specific conservation measures within the CA/CS have a high certainty of being implemented and therefore, the CA/CS as a whole has a high level of certainty of being implemented. This is because the signatory agencies have applied restoration and reintroduction techniques for Rio Grande cutthroat trout management for over a decade with positive results, and the agencies have dedicated high levels of resources (staff time and funds) to Rio Grande cutthroat trout management long before this CA/CS were conceived. Because many of the measures are being carried out bystate agencies subject to legislatively provided funding, we cannot be certain in the future levels of funding and staffing. However, the history of past funding and the recreational importance of conserving this subspecies provide enough certainty that funding will be provided in the future. The CA/CS provide the framework that will guide these efforts to provide the maximum conservation benefit to the species rangewide. We are confident that the efforts will continue to be implemented because we have this documented track record of past successful efforts. The CA/CS have sufficient monitoring and reporting requirements to ensure that all of the

conservation measures are implemented as planned and are effective at reducing the identified threats to the Rio Grande cutthroat trout. In addition, the CA/CS provides for significant restoration efforts to expand the distribution of the Rio Grande cutthroat trout and reduce the effects of future population extirpation from threats that cannot be completely controlled, such as wildfire. Based on our evaluation, we have determined that the specific conservation measures within the CA/CS have a high certainty of being effective, and, therefore, the program being carried out by the CA/CS as a whole has a high level of certainty of being effective. In addition, the Service will have an ongoing role in the implementation of the conservation measures by remaining on the Conservation Team, reviewing monitoring reports, and continuing discussion with the signatory agencies. We find that the specific conservation measures in the Rio Grande Cutthroat Trout Conservation Agreement and Conservation Strategy have a high level of certainty of implementation and effectiveness and will be considered as part of the basis for our listing determination for the Rio Grande cutthroat trout under the ESA.

PECE ANALYSIS – Vermejo CCAA

Background

In 2013, the Service signed a Candidate Conservation Agreement with Assurances with Vermejo Park Ranch (Vermejo CCAA). The goal of the Vermejo CCAA is to facilitate and promote the conservation and restoration of Rio Grande cutthroat trout on certain non-Federal lands owned by Vermejo Park Ranch, LLC. Vermejo Park Ranch consists of 590,823 acres (2,391 square kilometers) in Costilla County, Colorado, and Taos County, New Mexico, managed for conservation, hunting, and fishing. Vermejo Park Ranch is implementing the conservation measures specified in the Vermejo CCAA in exchange for assurances that if and when the Rio Grande cutthroat trout is listed under the Endangered Species Act of 1973, as amended (ESA), no further conservation measures will be required. Conservation measures being implemented by Vermejo Park Ranch include nonnative trout removal, Rio Grande cutthroat trout reintroductions, and increasing existing populations so they are capable of migrating among tributaries. Overall, the project encompasses the restoration of approximately 190 kilometers (118 miles) of stream habitat, and to date nearly 100 kilometers (62 miles) of restoration have been completed and are being monitored.

Certainty of Implementation

1. **The conservation effort, the parties to the agreement or plan who will implement the effort, and the staffing, funding level, funding source, and other resources necessary to implement the effort are identified.**

Conservation Effort: The Vermejo CCAA clearly outlines the conservation measures to be taken for the conservation of the Rio Grande cutthroat trout. Conservation measures detailed in the CCAA include installing temporary fish migration barriers, eliminating nonnative fish, best management practices for land use, and reestablishing and reconnecting populations of Rio Grande cutthroat trout (Table 3). These measures will contribute to the overall objective of creating a large, interconnected population of Rio Grande cutthroat trout in the upper Rio Costilla watershed in the Lower Rio Grande.

Parties to the Agreement: Vermejo Park Ranch, the Service, NMDGF, and CPW are the parties to the Vermejo CCAA. Vermejo Park Ranch owns all of the land covered by the Vermejo CCAA, and NMDGF and CPW, as the agencies charged with conservation and management of Rio Grande cutthroat trout, work closely with Vermejo Park Ranch to manage their trout populations and provide biologists to work with Vermejo in implementing this conservation effort.

Funding: Vermejo Park Ranch has committed to fund the conservation actions specified in the Vermejo CCAA. Vermejo Park Ranch is owned by Turner Enterprises, Inc. (TEI), which has sufficient funding and a history of successful conservation efforts on its ranches. On Vermejo Park Ranch, much of the Rio Grande cutthroat trout restoration has already begun, with Vermejo Park Ranch funding its share, well in advance of the signing of the Vermejo CCAA. The Turner Endangered Species Fund oversees conservation on Vermejo Park Ranch and other ranches owned

by TEI and has successfully funded and implemented CCAAs on other properties, including a CCAA for westslope cutthroat trout in Montana (Montana Department of Fish, Wildlife, and Parks *et al.* 2004).

NMDGF and CPW are state agencies with staff biologists dedicated to Rio Grande cutthroat trout management. Because Rio Grande cutthroat trout is a native recreational species, management is a priority for both states. NMDGF has had a Rio Grande cutthroat trout biologist position since 1989 and recently hired an assistant for the program. Since 2006, NMDGF has expended about $300,000 per year on conservation and management of the subspecies; funding levels are expected to remain equivalent in the future (Conservation Strategy, pp. 41–42). CPW has four staff members with Rio Grande cutthroat trout responsibility and expends approximately $100,000 annually on Rio Grande cutthroat trout management. Funding levels at CPW are also expected to remain constant (Conservation Strategy, p. 38). We have high confidence that the organizations participating in the Vermejo CCAA will provide the necessary resources to carry out the conservation measures identified in the plan.

2. The legal authority of the parties to the agreement or plan to implement the formalized conservation effort, and the commitment to proceed with the conservation effort are described.

As landowner where all the conservation measures are planned, Vermejo Park Ranch has the authority to enter into the Vermejo CCAA**.** Some conservation measures require additional authority, such as the use of piscicides in flowing waters. NMDGF obtained approval from the New Mexico Water Quality Control Commission (NMAC 20.6.4.16) to use piscicides in this project. A hearing, pursuant to NMAC 20.6.4.16, was held in Costilla, New Mexico, on February 22, 2006. The New Mexico Water Quality Control Commission approved the petition for the proposed action at their August 8, 2006 meeting for a period of five years. NMDGF obtained a renewal of the approval at the May 8, 2012 meeting. Approval by the New Mexico Water Quality Control Commission indicates that the proposed action complies with NMAC 20.6.4.16 and other applicable New Mexico water quality regulations.

3. The legal procedural requirements (e.g., environmental review) necessary to implement the effort are described, and information is provided indicating that fulfillment of these requirements does not preclude commitment to the effort.

The NEPA analysis for the conservation measures in the Vermejo CCAA was conducted in 2007. The Environmental Analysis for the Upper Rio Costilla Watershed covered the effects to physical, biological, and cultural resources and socioeconomic conditions that would result from restoring the fish community to the upper Rio Costilla watershed, which includes Vermejo Park Ranch (Service 2012). Additionally, the issuance of the ESA section 10(a)(1)(A) permit to Vermejo Park Ranch (Service 2013) was considered in an additional Environmental Assessment. Because all aspects of the on-the-ground work and Permit issuance have been considered in Environmental Analyses, no further analysis under NEPA is required. Additionally, as described above (see the **CA/CS** portion of this section), approval by the New Mexico Water Quality Control Commission for use of piscicides has been obtained. We conclude that environmental requirements have been

fulfilled and will not preclude the Vermejo CCAA signatories from completing conservation measures.

4. Authorizations (e.g., permits, landowner permission) necessary to implement the conservation effort are identified, and a high level of certainty is provided that the parties to the agreement or plan who will implement the effort will obtain these authorizations.

All authorizations necessary to implement the Vermejo CCAA have been identified and obtained. As stated above, the Environmental Assessments have been completed, and Vermejo Park Ranch owns the land and controls access to the areas on which the conservation measures will be completed. Water quality certification by the New Mexico Water Quality Control Commission has been obtained. To the best of our knowledge, no other authorizations are necessary.

5. The type and level of voluntary participation (*e.g.* number of landowners allowing entry to their land, or number of participants agreeing to change timber management practices and acreage involved) necessary to implement the conservation effort is identified, and a high level of certainty is provided that the parties to the agreement or plan who will implement the conservation effort will obtain that level of voluntary participation (*e.g.* an explanation of how incentives to be provided will result in the necessary level of voluntary participation).

The level and type of voluntary participation is clearly described in the Vermejo CCAA, as the only landowner enrolled in the CCAA is Vermejo Park Ranch. Although participation in the Vermejo CCAA is voluntary, Vermejo Park Ranch has been committed to Rio Grande cutthroat trout since at least 2000, when the first fist fish barrier was constructed. Through implementation of the CCAA, Vermejo Park Ranch receives assurances under the ESA that no further conservation will be required when and if the subspecies is listed as endangered or threatened, as well as an ESA section 10(A)(1)(a) permit for incidental take. We have a high level of certainty that Vermejo Park Ranch will continue conservation of the species and participation in the Vermejo CCAA.

6. Regulatory mechanisms (*e.g.*, laws, regulations, ordinances) necessary to implement the conservation effort are in place.

As discussed in criterion 2, the parties to the Vermejo CCAA have the legal and regulatory authority to implement the conservation measures.

7. A high level of certainty is provided that the parties to the agreement or plan who will implement the conservation effort will obtain the necessary funding.

There is a high level of certainty that Vermejo Park Ranch will continue to fund the conservation measures specified in the Vermejo CCAA. Vermejo Park Ranch and Turner Enterprises, Inc. have a long track record of funding conservation actions for numerous species on their lands nationwide. On Vermejo Park Ranch, Rio Grande cutthroat trout conservation work has been ongoing with much of the funding provided by Turner Enterprises, Inc. since at least 2000. In Montana, Turner Enterprises, Inc. has implemented a similar CCAA for westslope cutthroat trout

with much success. We have a high level of certainty that Vermejo Park Ranch will show the same commitment to funding the specific conservation measures.

8. An implementation schedule (including incremental completion dates) for the conservation effort is provided.

While there is no specific implementation schedule in the Vermejo CCAA, the Vermejo Park Ranch has demonstrated a commitment to implement the planned conservation measures in a timely way. For example, many of the actions have already been undertaken: nearly 100 kilometers of stream and 10 lakes have already been treated with piscicides to remove nonnative fish and restocked with Rio Grande cutthroat trout (Kruse 2013, p. 2). The project is scheduled to be completed by 2020. Even though the Vermejo CCAA does not provide an implementation plan for the 25-year agreement, we are highly confident that future conservation measures will be carried out and monitored over a reasonable time frame that promotes the conservation of the Rio Grande cutthroat trout.

9. The conservation agreement or plan that includes the conservation effort is approved by all parties to the agreement or plan.

The CCAA between Vermejo Park Ranch, the Service, New Mexico Department of Game and Fish, and Colorado Division of Parks and Wildlife was signed by all parties on June 18, 2013.

Certainty of Effectiveness

10. The nature and extent of threats being addressed by the conservation effort are described, and how the conservation effort reduces the threats is described.

The CCAA on Vermejo Park Ranch was developed to minimize threats to the subspecies on lands owned by the Ranch and promote the development of a metapopulation within the Rio Costilla watershed. The threats to the subspecies include small population sizes, hybridization and competition from nonnative trout, whirling disease, and the effects of climate change, including dewatering from drought, the effects of wildfire, and increased stream temperatures. These threats are discussed in detail in the Vermejo CCAA, and the conservation measures were developed to directly address them. We describe below how the conservation measures are designed to minimize the threats to the Rio Grande cutthroat trout. The conservation measures include:

<u>Eliminate Nonnative Fish:</u> An immediate threat to Rio Grande cutthroat trout populations is hybridization and competition with nonnative trout. To minimize the contact of nonnative trout with Rio Grande cutthroat trout, barriers have been constructed where natural barriers didn't already exist in order to prevent nonnatives from invading, reducing the risk of hybridization and competition. Monitoring and maintenance of these barriers is essential. Installing upstream fish migration barriers, discontinuing stocking of nonnative trout species, and applying piscicide throughout the watershed are proven techniques to remove nonnative trout species and prevent

their reintroduction into the watershed. These actions will minimize the threat of hybridization and competition with nonnative fish on Vermejo Park Ranch.

Maintain Habitat Quality: Best management practices will be used during land management activities to minimize impacts on stream habitat and Rio Grande cutthroat trout populations. Erosion and silt control measures will be used during land management or infrastructure maintenance. Riparian monitoring will be conducted to assess impacts of domestic grazing, if any. The maintenance of the existing high quality Rio Grande cutthroat trout habitat will ensure high population productivity, as well as complexity of habitats for the subspecies to continue to persist over time.

Reestablish and Maintain Viable Populations: Vermejo Park Ranch will restore and maintain viable populations of Rio Grande cutthroat trout in the headwaters of Rio Costilla to reestablish a genetically diverse metapopulation more likely to withstand demographic and environmental stochasticity. This is accomplished through the construction of fish barriers, remove nonnative trout from a stream reach, and repatiration with Rio Grande cutthroat trout. The metapopulation on Vermejo Park Ranch will be the largest, most interconnected population across the subspecies' range.

Table 3. Risk factors addressed by conservation measures in the Vermejo CCAA.

Risk Factors	Conservation Measures to Address the Risk Factors
Nonnative species	**Eliminate nonnative fish:** Discontinue stocking of nonnative trout into covered waters, install upstream fish migration barriers, and deploy piscicides in covered waters.
Stream drying, wildfire, increased water temperature	**Maintain habitat quality:** Conduct land use activities to minimize negative effects on fish populations and habitat **Reestablish and maintain viable populations:** A genetically diverse metapopulation of Rio Grande cutthroat trout will be restored and managed on Vermejo Park Ranch lands.
Disease	**Reestablish and maintain viable populations:** The reestablishment and maintenance of existing populations will include ensuring the downstream fish barrier is maintained, which will prevent whirling disease-positive fish from invading.

We have a high level of certainty that this criterion has been met.

11. Explicit incremental objectives for the conservation effort and dates for achieving them are stated.

We analyzed if explicit incremental objectives for the conservation effort and dates for achieving components of the conservation effort were stated. This criterion is designed to ensure that, if information is incomplete, implementation can nevertheless proceed to move towards incremental objectives until the additional information is available, at which time implementation can be modified in accordance with the new information (68 FR 15103, 15105).

Vermejo Park Ranch has already implemented the bulk of the incremental objectives identified in the CCAA (pp. 6–7). To date, nearly 100 kilometers of stream and 10 lakes have been successfully chemically treated to remove nonnative trout and are being restocked with Rio Grande cutthroat trout (Kruse 2013, p. 2). Where Rio Grande cutthroat trout have been restocked, ongoing monitoring has revealed that populations are recovering as expected. We have a high level of certainty this criterion has been met.

12. The steps necessary to implement the conservation effort are identified in detail.

The first step to implement the Vermejo CCAA, which was signed in June 2013, was to continue coordination between Vermejo Park Ranch, NMDGF, and CPW regarding stream piscicide treatments and restorations. Although the CCAA was only signed recently, the work on the Ranch has been ongoing since 2007. Many streams have had Rio Grande cutthroat trout already reintroduced, and others are undergoing treatments. The coordination and planning between Vermejo Park Ranch and the state agencies has been ongoing and will continue to ensure this effort is successful. The parties to the agreement will continue to identify streams to be restored, populations to be surveyed, barriers to be monitored and maintained, and genetic monitoring to be conducted. We have concluded that the steps necessary to implement the conservation measures have been identified, and we have a high level of certainty this criterion has been met.

13. Quantifiable, scientifically valid parameters that will demonstrate achievement of objectives, and standards for these parameters by which progress will be measured, are identified.

The goal of the Vermejo CCAA is to support a large, connected self-sustaining metapopulation on lands owned by Vermejo Park Ranch (Vermejo CCAA, p. 8). Once established, Rio Grande cutthroat trout populations in both Costilla and Casias creeks upstream of Costilla Reservoir will each support a self-sustaining population of at least 500 adults (defined as a fish greater than 120 millimeters in length), which is roughly equivalent to an effective population size (number adults actually contributing offspring to the population) of 500, as determined through monitoring activities. To be considered self-sustaining (surviving in the absence of active management intervention over time), the survey results on each creek will include evidence of recruitment, such as the presence of young-of-year fish, juvenile fish, or multiple age or size classes.

These parameters are quantitative, and the standards for population size (500 adults) are accepted in the scientific literature for salmonids (Allendorf *et al.* 1997, p. 142). We have a high certainty this criterion has been met.

14. Provisions for monitoring and reporting progress on implementation (based on compliance with the implementation schedule) and effectiveness (based on evaluation of quantifiable parameters) of the conservation effort are provided.

The Vermejo CCAA outlines both types of monitoring that will be conducted – compliance monitoring for implementation and biological monitoring for effectiveness of the conservation measures (Vermejo CCAA, p. 12). Compliance monitoring will consist of ensuring implementation

of the Vermejo CCAA and fulfillment of its provisions. Additionally, biological monitoring will consist of determining that Rio Grande cutthroat trout populations become self-sustaining once established. Populations will be monitored at least once every five years, and barrier function and stability will be monitored annually. An annual meeting between the Partners to the Vermejo CCAA is held to review field season activities and ensure the Vermejo CCAA is being implemented. If populations are not responding as expected, the Partners to the Vermejo CCAA have committed to reviewing the potential causes of the population not meeting the required parameters at the annual meeting of the Partners. If the Partners do not agree on the causes or remedies, an independent assessment will be conducted by a mutually agreed upon party, and the resulting recommendations will be implemented. Based on the above, we conclude that there are provisions for monitoring in the Vermejo CCAA.

15. Principles of adaptive management are incorporated.

We conclude the Vermejo CCAA incorporate principles of adaptive management. Because the Vermejo CCAA does not prescribe how Rio Grande cutthroat trout will be reintroduced or give specifics for the best management practices that will be employed by Vermejo Park Ranch, the parties are given the flexibility to meet the goals of the agreement (a self-sustaining metapopulation) while allowing the parties to maintain flexibility regarding how those goals will be met. Additionally, certain changed circumstances are provided for in the Vermejo CCAA, including provisions for drought, increased stream temperature, wildfire, and accidental introduction of nonnative trout, along with recognition that the CCAA provides conservation measures to address these changed circumstances. In a conservation effort of this sort, with experienced biologists implementing proven techniques over a limited landscape, a full adaptive management plan is not generally necessary.

Conclusion

Using the criteria in PECE (68 FR 15115, March 28, 2003), we evaluated the certainty of implementation and effectiveness of the Candidate Conservation Agreement with Assurances with Vermejo Park Ranch. We have determined that the specific conservation actions within the CCAA have a high certainty of being implemented, and therefore, the CCAA as a whole has a high level of certainty of being implemented. This is because Vermejo Park Ranch and Turner Enterprises, Inc., have a long history of implementing conservation efforts for native species. Rio Grande cutthroat trout restoration on Vermejo Park Ranch began years before the Vermejo CCAA was completed; they have demonstrated a commitment to Rio Grande cutthroat trout restoration. The Vermejo CCAA has sufficient monitoring and reporting requirements to ensure all of the conservation measures are implemented as planned and are effective at reducing threats to the Rio Grande cutthroat trout. Based on our evaluation, we have determined that the specific conservation actions within the CCAA have a high certainty of being effective and therefore, the CCAA as a whole has a high level of certainty of being effective. In addition, the Service will have an ongoing role in the implementation of the conservation measures by attending annual meetings and continuing discussions with the parties to the agreement. We find that the specific conservation actions in the Vermejo CCAA have a high level of certainty of implementation and effectiveness and will be

considered as part of the basis for our listing determination for the Rio Grande cutthroat trout under the ESA.

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