



September 12, 2016

*Via Email and Certified Mail with Return Receipt Requested*

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**Re: 60-Day Notice of Intent to Sue the BLM and U.S. Fish and Wildlife Service Pursuant to the Endangered Species Act Regarding Oil and Gas Exploration and Development in the Upper Colorado River Basin in Colorado**

Dear Director Ashe, Director Kornze, and Secretary Jewell:

This letter serves as the Center for Biological Diversity, Living Rivers, and Rocky Mountain Wild's formal notice of intent to sue the Bureau of Land Management (BLM) and U.S. Fish and Wildlife Service (Service) for violations of the Endangered Species Act, 16 U.S.C. §§ 1531-1544 (ESA), concerning oil and gas exploration and development authorized by BLM within the Upper Colorado River Basin of western Colorado.<sup>1</sup> Specifically, Center for Biological Diversity, Living Rivers, and Rocky Mountain Wild intend to file suit to challenge (1) BLM's and the Service's failure to timely reinitiate and complete ESA Section 7 consultation on water depletion impacts to the Colorado pikeminnow (*Ptychocheilus lucius*), humpback chub (*Gila cypha*), razorback sucker (*Xyrauchen texanus*), and bonytail (*Gila elegans*) (collectively, "endangered fish") and their designated critical habitat from BLM-authorized oil and gas exploration and development in the Upper Colorado River Basin of western Colorado; (2) the Service's April 27, 2015 Biological Opinion – Revision of the Resource Management Plan (RMP) for the Grand Junction Field Office, and BLM's reliance on that April 27, 2015 Biological Opinion to satisfy its Section 7 consultation obligations; (3) the Service's March 11, 2015 Letter of Concurrence –

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<sup>1</sup> 16 U.S.C. § 1540(g)(2).

Oil and Gas Amendment to the White River Field Office RMP, and BLM's reliance on that March 11, 2015 Letter of Concurrence to satisfy its Section 7 consultation obligations; (4) BLM's failure to insure that its authorization of oil and gas exploration and development in the Upper Colorado River Basin in Colorado is not likely to jeopardize the continued existence of the four endangered fish or result in the destruction or adverse modification of their critical habitat; and (5) BLM's continued authorization of oil and gas exploration and development in the Upper Colorado River Basin in Colorado that have caused and will continue to result in unauthorized take of endangered fish, in violation of Section 9 of the ESA.

In August 2015, BLM approved the Grand Junction RMP and White River RMP Amendment, which together would allow the development of nearly 19,000 oil and gas wells in the Upper Colorado River Basin in western Colorado, through 2029. These activities, along with oil and gas activities authorized by BLM's other western Colorado field offices, are collectively known as BLM's Fluid Mineral Development Program. Hydraulic fracturing (or "fracking") and horizontal drilling of these new wells would require tremendous amounts of water and heighten the risk of spills and leaks from fracking chemicals and wastewaters, degrading and diminishing critical habitat and weakening endangered fish populations. BLM and the Service, however, failed to properly consult regarding the water depletion and spill impacts of this massive increase in new wells on the endangered fish, in violation of Section 7 of the ESA.

In addressing the RMPs' water depletion effects, the Service relied on a 2008 programmatic biological opinion covering the Fluid Mineral Development Program's water depletions (Fluid Mineral PBO or PBO);<sup>2</sup> however, that reliance is woefully misplaced:

- The outdated PBO does not address new drilling techniques, such as horizontal drilling, which have much greater water depletion effects than prior methods. Nor does it take into account the enormous development potential of the Mancos shale play, the development of which requires horizontal drilling.
- The PBO entirely ignores climate change effects. Hotter temperatures have already led to dwindling stream flows, compounding existing and new threats to the fish and undermining recovery efforts.
- Over the last eight years, it has become increasingly apparent that the Upper Colorado River Endangered Fish Recovery Program (Recovery Program) cannot sustain recommended flows necessary to the endangered fishes' recovery, in one of the most important habitats for the Colorado pikeminnow and razorback sucker—the "15-Mile Reach"—contrary to the PBO's assumptions in the effects analysis.
- The PBO is outdated, in light of new information documenting threats to the Colorado River endangered fish from mercury and selenium deposition and bioaccumulation—

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<sup>2</sup> U.S. Fish & Wildlife Service (USFWS), Programmatic Biological Opinion for Water Depletions Associated with Bureau of Land Management's Fluid Mineral Program within the Upper Colorado River Basin in Colorado (Dec. 19, 2008) ("PBO").

threats that will only be exacerbated by increasing water withdrawals, climate change, and declining stream flows.

The impacts on the endangered fish and their critical habitat from each of the above factors constitutes new information revealing that BLM-authorized wells and associated water depletions may affect the endangered fish in a manner or to an extent that was not considered in the Fluid Mineral PBO. Reinitiation of formal consultation of BLM's Fluid Mineral Program is required by the plain language of implementing regulations for ESA Section 7, 50 C.F.R. § 402.16; however, BLM and the Service have failed to reinitiate consultation.

Reinitiation of consultation is also required due to the ongoing adverse impacts to Colorado pikeminnow and humpback chub and the Recovery Program's failure to achieve any gains in recovery of the endangered fish. The Recovery Program—which serves as a “reasonable and prudent” measure to offset the impacts of various water depleting activities in the Upper Colorado River Basin, including the Fluid Mineral Program—has made no progress towards recovering the Colorado pikeminnow and humpback chub after 28 years and over \$400 million spent on the Program. The Colorado pikeminnow's Colorado River and Green River sub-basin populations have steadily decreased, and no progress towards establishing a core population of humpback chub in the Upper Basin has been made. The Recovery Program's failure to achieve a “positive response” in these populations undermines the assumption that any depletions would be offset by the Program, and triggers reinitiation of consultation under the terms of the PBO.<sup>3</sup>

To make matters worse, BLM and the Service have disregarded clear requirements important to protecting the endangered fishes' habitat under the Fluid Mineral PBO. These violations of the PBO also trigger reinitiation of consultation. First, rather than monitoring *actual* water depletions of *vertical* wells to ensure that incidental take does not exceed levels authorized by the PBO, BLM multiplies the total number of vertical wells drilled each year in each sub-basin by a standard depletion factor to obtain an annual depletion estimate.<sup>4</sup> Without actual monitoring, BLM has no handle on the Fluid Mineral Program's actual effects on the fish, in violation of the clear requirements of the PBO and the Services' regulations.<sup>5</sup> Second, despite tracking actual water use by *horizontal* wells, BLM has permitted water depletions from horizontal wells in excess of the depletion threshold for the Colorado River sub-basin: in fiscal year (FY) 2015, the amount of water depleted by all federal oil and gas development in the sub-basin—the surrogate for take—was almost twice the amount authorized by the PBO's incidental take statement.

The Service's April 27, 2015 Biological Opinion – Revision of the RMP for the Grand Junction Field Office and March 11, 2015 Letter of Concurrence for the Oil and Gas Amendment to the White River Field Office RMP also both violate the ESA, and are arbitrary and capricious under the Administrative Procedure Act (APA).<sup>6</sup> The Service failed to consider a number of relevant factors in preparing the 2005 Biological Opinion and Letter of Concurrence, including new drilling technologies and greater oil and gas development potential within western Colorado,

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<sup>3</sup> PBO at 52.

<sup>4</sup> See PBO at 5.

<sup>5</sup> See 16 U.S.C. § 1536(b)(4), 50 C.F.R. § 402.14(i).

<sup>6</sup> 5 U.S.C. § 706.

climate change effects, endangered fish population declines, Recovery Program shortfalls, and mercury and selenium pollution threats to the endangered fish. The Service also improperly tiered to and relied on the outdated PBO for the consultations concerning Fluid Mineral Program water depletions allowed under the revised and amended RMPs. Just as BLM and the Service must reinitiate consultation on the Fluid Mineral Program's water depletion effects, the agencies must also reinitiate consultation over the Grand Junction and White River RMPs, which relied on the flawed and outdated PBO.

Further, the agencies' consultations over the RMPs' spill effects on the endangered fish (which are not covered by the PBO) are deficient. Spills and leaks are certain to increase with expanded fracking, but the Biological Assessments (BA) for the RMPs dismiss these effects based on flawed and unsupported reasoning. The Service's adoption of the BAs' findings are arbitrary and capricious and violate the APA. The consultations over the Grand Junction and White River RMPs also failed to rely on the best available information, in violation of ESA Section 7(a)(2), 16 U.S.C. § 1536(a)(2).

Accordingly, BLM's reliance on the unlawful 2015 Biological Opinion and 2015 Letter of Concurrence violated BLM's independent duty to comply with Section 7 of the ESA.<sup>7</sup> Moreover, despite the ongoing failure of the Service and BLM to timely reinitiate and complete consultation on the water depletions and spill effects associated with BLM-authorized oil and gas exploration and development in the Upper Colorado River Basin in western Colorado, BLM continues to authorize and allow oil and gas activities that may affect the four endangered fish and their critical habitat. BLM has thereby failed to insure that its authorization of oil and gas exploration and development in the Upper Colorado River Basin is not likely to jeopardize the continued existence of the four endangered fish or result in the destruction or adverse modification of their critical habitat.<sup>8</sup>

Finally, BLM's continued authorization and approval of oil and gas exploration and development within the Upper Colorado River Basin in western Colorado violates Section 9 of the ESA, which makes it unlawful to authorize or approve any activity that causes the unauthorized "take" of an endangered or threatened species. Ongoing and proposed horizontal drilling projects, including the Bull Mountain Master Development Plan (MDP), Debeque Southwest MDP, and Homer Deep MDP, further cause or threaten take in violation of Section 9.<sup>9</sup>

Unless your agencies take immediate steps to correct these violations, we intend to file suit in 60 days, and will seek declaratory and injunctive relief as well as reasonable litigation costs and attorneys' fees, for your violations of the ESA.<sup>10</sup>

## **I. LEGAL BACKGROUND**

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<sup>7</sup> 16 U.S.C. § 1536(a)(2).

<sup>8</sup> *Id.*

<sup>9</sup> *Id.* § 1538(a)(1)(B).

<sup>10</sup> *Id.* § 1540(g).

**A. The Duty to Insure Against Jeopardy and Adverse Modification of Critical Habitat Under Section 7 of the ESA**

Congress enacted the ESA in 1973 to provide for the conservation of endangered and threatened fish, wildlife, plants and their natural habitats.<sup>11</sup> The ESA imposes substantive and procedural obligations on all federal agencies with regard to listed and proposed species and their critical habitats.<sup>12</sup>

Under Section 7 of the ESA, federal agencies must “insure that any action authorized, funded, or carried out by such agency ... is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species which is determined ... to be critical.”<sup>13</sup>

The definition of agency “action” is broad and includes “all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies,” including programmatic actions.<sup>14</sup> Likewise, the “action area” includes “all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action.”<sup>15</sup>

The duties in ESA Section 7 are only fulfilled by an agency’s satisfaction of the consultation requirements that are set forth in the implementing regulations for Section 7 of the ESA, and only after the agency lawfully complies with these requirements may an action that “may affect” a protected species go forward.<sup>16</sup>

The action agency must initially prepare a biological assessment (BA) to “evaluate the potential effects of the proposed action” on listed species.<sup>17</sup> If the action agency concludes that the proposed action is “not likely to adversely affect” a listed species that occurs in the action area, the Service must concur in writing with this determination.<sup>18</sup> If the Service concurs in this determination, then formal consultation is not required.<sup>19</sup> If the Service’s concurrence in a “not likely to adversely affect” finding is inconsistent with the best available data, however, any such concurrence must be set aside.<sup>20</sup>

If the action agency concludes that an action is “likely to adversely affect” listed species or critical habitat, it must enter into “formal consultation” with the Service.<sup>21</sup> The threshold for triggering the formal consultation requirement is “very low;” indeed, “any possible effect ... triggers formal consultation requirements.”<sup>22</sup>

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<sup>11</sup> *Id.* §§ 1531, 1532.

<sup>12</sup> *See id.* §§ 1536(a)(1), (a)(2) and (a)(4) and § 1538(a); 50 C.F.R. § 402.

<sup>13</sup> 16 U.S.C. § 1536(a)(2).

<sup>14</sup> 50 C.F.R. § 402.02.

<sup>15</sup> *Id.*

<sup>16</sup> *Pac. Rivers Council v. Thomas*, 30 F.3d 1050, 1055-57 (9th Cir. 1994).

<sup>17</sup> 50 C.F.R. § 402.12.

<sup>18</sup> *Id.* §§ 402.13(a) and 402.14(b).

<sup>19</sup> *Id.* § 402.13(a).

<sup>20</sup> *See id.* § 402.14(g)(8); 5 U.S.C. § 706(2).

<sup>21</sup> 50 C.F.R. §§ 402.12(k), 402.14(a).

<sup>22</sup> *See* Interagency Cooperation Under the Endangered Species Act, 51 Fed. Reg. 19,926 (June 3 1996).

Formal consultation commences with the action agency’s written request for consultation and concludes with the Service’s issuance of a “biological opinion.”<sup>23</sup> The biological opinion states the Service’s opinion as to whether the effects of the action are “likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat.”<sup>24</sup> When conducting formal consultation, the Service and the action agency must evaluate the “effects of the action,” including all direct and indirect effects of the proposed action, plus the effects of actions that are interrelated or interdependent, added to all existing environmental conditions – that is, the “environmental baseline.”<sup>25</sup> The environmental baseline includes the past and present impacts of all Federal, state, and private actions and other human activities in the action area....<sup>26</sup> The effects of the action must be considered together with “cumulative effects,” which are “those effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation.”<sup>27</sup>

If the Service concludes in a biological opinion that jeopardy is likely to occur, it must prescribe “reasonable and prudent alternatives” to avoid jeopardy.<sup>28</sup> If the Service concludes that a project is not likely to jeopardize listed species, it must nevertheless provide an incidental take statement (ITS) with the biological opinion, specifying the amount or extent of take that is incidental to the action (but which would otherwise be prohibited under Section 9 of the ESA), “reasonable and prudent measures” (RPMs) necessary or appropriate to minimize such take, and the “terms and conditions” that must be complied with by the action agency to implement any reasonable and prudent measures.<sup>29</sup>

The ESA requires federal agencies to use the best scientific and commercial data available when consulting about whether federal actions may jeopardize listed species or adversely modify critical habitat.<sup>30</sup> Accordingly, an action agency must “provide the Service with the best scientific and commercial data available or which can be obtained during the consultation for an adequate review of the effects that an action may have upon listed species of critical habitat.”<sup>31</sup> Likewise, “[i]n formulating its biological opinion...the Service will use the best scientific and commercial data available.”<sup>32</sup> However, if the action agency failed “to discuss information that would undercut the opinion’s conclusions,” the biological opinion is legally flawed, and the ITS will not insulate the agency from ESA Section 9 liability.<sup>33</sup>

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<sup>23</sup> 50 C.F.R. § 402.02.

<sup>24</sup> *Id.* § 402.14(g)(4). To “jeopardize the continued existence of” means “to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species.” *Id.* § 402.02.

<sup>25</sup> *Id.* §§ 402.14 and 402.02.

<sup>26</sup> *Id.*

<sup>27</sup> *Id.*

<sup>28</sup> *Id.* § 402.14(h)(3).

<sup>29</sup> 16 U.S.C. § 1536(b)(4); 50 C.F.R. § 402.14(i).

<sup>30</sup> *See* 16 U.S.C. § 1536(a)(2).

<sup>31</sup> 50 C.F.R. § 402.14(d).

<sup>32</sup> *Id.* § 402.14(g)(8).

<sup>33</sup> *See Ctr. for Biological Diversity v. BLM (“CBD”)*, 698 F.3d 1101, 1127-28 (9th Cir. 2012).

After the issuance of a biological opinion and “where discretionary Federal involvement or control over the action has been retained or is authorized by law,” the agency must reinitiate consultation if:

- the amount or extent of taking specified in the incidental take statement is exceeded;
- new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered;
- the identified action is subsequently modified in a manner that causes an effect to the listed species ... that was not considered in the biological opinion; or
- a new species is listed or critical habitat designated that may be affected by the identified action.<sup>34</sup>

In addition, courts have found that a violation of the terms of an ITS obligates the action agency to reinitiate consultation, and “[w]hen an agency violates the terms of an ITS, a private party may bring a citizen suit alleging that by virtue of this violation, the agency’s failure to reinitiate consultation violates the agency’s statutory duty to avoid jeopardy under ESA Section 7(a)(2).”<sup>35</sup>

Section 7(d) of the ESA provides that once a federal agency initiates consultation on an action under the ESA, the agency, as well as any applicant for a federal permit, “shall not make any irreversible or irretrievable commitment of resources with respect to the agency action which has the effect of foreclosing the formulation or implementation of any reasonable and prudent alternative measures which would not violate subsection (a)(2) of this section.”<sup>36</sup> The purpose of Section 7(d) is to maintain the environmental status quo pending the completion of consultation. Section 7(d) prohibitions remain in effect throughout the consultation period and until the federal agency has satisfied its obligations under Section 7(a)(2) that the action will not result in jeopardy to listed species or adverse modification of critical habitat.

## **B. The Prohibition on Take of Listed Species under Section 9 of the ESA**

In authorizing and allowing activities that harm federally-protected species, such as oil and gas drilling and associated water depletions, the BLM and private actors are potentially liable under Section 9 of the ESA. Under Section 9(a)(1)(B) of the ESA, it is illegal to engage in any activity that “takes” an endangered species.<sup>37</sup>

The term “take” is defined in the “broadest possible manner to include every conceivable way” in which a person could harm or kill wildlife.<sup>38</sup> The term “take” is defined in the statute to include “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.”<sup>39</sup>

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<sup>34</sup> 50 C.F.R. § 402.16.

<sup>35</sup> *South Yuba River Citizens League v. Nat’l Marine Fisheries Serv.*, 629 F. Supp. 2d 1123, 1133 (E.D. Cal. 2009).

<sup>36</sup> 16 U.S.C. § 1536(d).

<sup>37</sup> *Id.* § 1538(a)(1)(B).

<sup>38</sup> S. Rep. No. 93-307, 93d Cong., 1st Sess. 1, reprinted in 1973 USCAAN 2989, 2995.

<sup>39</sup> 16 U.S.C. § 1532(18).

The ESA's implementing regulations define "harm" to mean "significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering."<sup>40</sup> The term "harass" is defined to mean "an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering."<sup>41</sup>

Persons subject to the prohibition on take include individuals and corporations, as well as "any officer, employee, agent, department, or instrumentality of the Federal Government."<sup>42</sup> Further, "a regulatory scheme authorizing third parties to engage in actions that result in takings itself violates the ESA."<sup>43</sup> Where violation of the Section 9 take prohibition is alleged, a court must issue an injunction if a plaintiff establishes by a preponderance of the evidence that there is "a reasonably certain threat of imminent harm to a protected species."<sup>44</sup> Because Congress has accorded the protection of endangered species the highest of priorities, courts do not have the discretion to withhold injunctive relief where it is necessary to prevent an imminent and likely violation of the ESA.<sup>45</sup>

While there is a general prohibition on take of listed species, incidental take can be authorized under Section 7 through the provision of and compliance with an ITS.<sup>46</sup> It is well settled, however, that violations of the terms and conditions of a biological opinion and ITS expose ESA take liability.<sup>47</sup> Courts have found that a violation of an ITS's terms "abrogates the safe harbor provision of the ITS."<sup>48</sup> Thus, if an applicant does "not comply with all of the terms of the Biological Opinion, they would not be protected by the Biological Opinion's safe harbor" and would be subject to take liability.<sup>49</sup> This includes the action agency, which disregards an ITS "at its own peril (and that of its employees)."<sup>50</sup>

## **II. Factual Background**

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<sup>40</sup> 50 C.F.R. § 17.3.

<sup>41</sup> *Id.*

<sup>42</sup> 16 U.S.C. § 1532(13).

<sup>43</sup> *Strahan v. Coxe*, 127 F.3d 155, 163, 168 (1st Cir. 1997); *Animal Welfare Inst. v. Martin*, 623 F.3d 19 (1st Cir. 2010); *Defenders of Wildlife v. EPA*, 882 F.2d 1294 (8th Cir. 1988); *Loggerhead Turtle v. County Council of Volusia County*, 148 F.3d 1231 (11th Cir. 1998); *Seattle Audubon Soc'y v. Sutherland*, 2007 U.S. Dist. LEXIS 31880, 2007 WL 1300964 (W.D. Wash. May 2, 2007).

<sup>44</sup> *Defenders of Wildlife v. Bernal*, 204 F.3d 920, 925 (9th Cir. 2000); *Animal Welfare Institute v. Beech Ridge Energy*, 675 F. Supp. 2d 540, 563 (D. Md. 2009).

<sup>45</sup> *Tennessee Valley Auth. v. Hill*, 437 U.S. 153, 184 (1978).

<sup>46</sup> 16 U.S.C. § 1536(o) ("[A]ny taking that is in compliance with the terms and conditions specified in a written statement provided under subsection (b)(4)(iv) of this section shall not be considered to be a prohibited taking of the species concerned.")

<sup>47</sup> *See Bennett v. Spear*, 520 U.S. 154, 170 (1997); *Nat'l Wildlife Fed'n v. Nat'l Marine Fisheries Serv.*, 481 F.3d 1224, 1230 (9th Cir. 2007); *Mount Graham Red Squirrel v. Espy*, 986 F.2d 1568, 1580 (9th Cir. 1993) (held that violation of an ITS would remove protective coverage from take liability).

<sup>48</sup> *Or. Natural Desert Ass'n v. Tidwell*, 716 F. Supp. 2d 982, 995 (D. Or. 2010); *see also South Yuba*, 629 F. Supp. 2d at 1132.

<sup>49</sup> *Dow AgroSciences LLC v. Nat'l Marine Fisheries Serv.*, 637 F.3d 259, 266 (4th Cir. 2011).

<sup>50</sup> *Bennett*, 520 U.S. at 170.



## **A. The Four Endangered Fish**

The development of oil and gas wells in the Upper Colorado River Basin (or “Upper Basin”) in western Colorado will adversely impact several species of endangered fish. Collectively, these endangered fish once inhabited thousands of miles of the Colorado River and its tributaries, including rivers in western Colorado. While they were once abundant and widespread throughout the Upper Basin, dam construction, introduction of nonnative species, and stream regulation have decimated their populations and now only a few sub-populations remain. The Service has listed each of the species as “endangered”<sup>51</sup> and designated a total of 1,980 miles of critical habitat for the endangered fish throughout the entire Colorado River Basin.<sup>52</sup>

### *1. The Endangered Fish and Their Habitat*

The Colorado pikeminnow is an elongated pike-like fish and the largest minnow in North America that once grew as large as 6 feet and weighed nearly 100 pounds. It now rarely exceeds 3 feet or more than 18 pounds. It is a top predator in the Colorado River system and adapted to warm rivers.

The razorback sucker is a bottom browser that primarily feeds on algae, plant debris, and aquatic insect larvae. It often reaches over two feet in length and over 6 pounds. Both the Colorado pikeminnow and razorback sucker are migratory fish known to travel several hundreds of miles to spawning areas. Each can live up to 40 years.

The humpback chub and bonytail are both medium-sized, omnivorous fish in the minnow family and endemic to the Colorado River Basin, growing up to approximately 20 inches in length and living up to 30 and 50 years respectively. The humpback chub’s distribution is restricted to remote whitewater canyons; its distinct hump acts as a stabilizer that helps it maintain position in its whitewater habitat. The bonytail is so rare that its preferred habitat is unknown, but its large fins and streamlined body are adapted to swimming through swift river flows.

As set forth in the PBO, each of the endangered fish depends on sufficient natural flows, including peak spring flows, to create and provide habitat for various life phases. For example, the humpback chub spawn as peak spring flows begin to decline. These flows provide organic matter for food, clean spawning substrates, provide physical cues for spawning, create shoreline eddy habitats important for spawning, and maintain complex shoreline habitats used as nursery habitat by young fish. Bonytail may have similar habitat requirements. Peak spring flows are also important for the Colorado pikeminnow, which need riffles or shallow runs with cobble devoid of sediment for spawning. Natural flows are important to flooding bottomlands which make suitable habitat for nursery areas for the razorback sucker.<sup>53</sup> Natural flows are also needed to inundate areas to provide migration corridors for access to spawning, nursery, feeding, and rearing habitats.

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<sup>51</sup> 32 Fed. Reg. 4001 (Mar. 11, 1967) (Colorado pikeminnow and humpback chub); 45 Fed. Reg. 27623 (Apr. 23, 1980) (bonytail); 56 Fed. Reg. 54957 (Oct. 23, 1991) (razorback sucker).

<sup>52</sup> 59 Fed. Reg. 13374 (Mar. 21, 1994).

<sup>53</sup> USFWS, Razorback Sucker, Recovery Goals, Amendment and Supplement to the Razorback Sucker Recovery Plan, 110 (2002).

Each of the fish has been extirpated from large portions of its historic range. In the Upper Colorado River Basin, 435 miles of Colorado pikeminnow habitat has been lost by reservoir inundation from Flaming Gorge Reservoir on the Green River, Lake Powell on the Colorado River, and Navajo Reservoir on the San Juan River. The rarest native fish, the bonytail, has no known self-sustaining populations in the wild. It is so rare it is not possible to conduct population estimates. Stocking is the only means to prevent extirpation of the bonytail and razorback sucker.

According to the Service, one of the most important habitats to the Colorado pikeminnow and razorback sucker is the “15-Mile Reach” of the Colorado River within Colorado’s Grand Valley.<sup>54</sup> The 15-Mile Reach extends from the confluence of the Gunnison River in Grand Junction to Palisade, Colorado, fifteen miles upstream.<sup>55</sup> This reach falls within the Grand Junction Field Office, and the river and tributaries feeding this reach flow through the Grand Junction and Colorado River Valley Field Offices.<sup>56</sup> The 15-Mile Reach provides important spawning grounds for both species and year-round habitat for the Colorado pikeminnow.<sup>57</sup>

## *2. Threats to the Endangered Fish: Water Depletions, Climate Change, and Mercury and Selenium Pollution*

Historically, the devastating harm to endangered fish populations in the Colorado River Basin was due primarily to the construction of dams, which caused a loss of suitable habitat. Dam construction drastically modified the river’s natural hydrology and channel characteristics throughout the Colorado River Basin, fragmenting the river ecosystem, blocking migrations, reducing temperatures downstream of dams, creating lake habitat, and creating conditions favorable to nonnative fish predators and competitors. Threats to these species also include stream regulation, habitat modification, competition with and predation by nonnative fish, and pesticides and pollutants.

Water depletions from other uses, such as oil and gas development, contribute to and exacerbate these threats. Removal of water changes the natural hydrologic regime that creates and maintains spawning habitats, nursery areas, and migratory corridors, reducing the availability of these habitats.<sup>58</sup> Reduced water levels increase the concentration of pollutants and contaminants that are toxic to the endangered fish, which could increase bioaccumulation of contaminants in the

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<sup>54</sup> PBO at 36, 42; USFWS, Final Programmatic Biological Opinion for Bureau of Reclamation’s Operations and Depletions, Other Depletions, and Funding and Implementation of Recovery Program Actions in the Upper Colorado River above the Confluence with the Gunnison River, 25, 32, 45 (Dec. 1999) (“Colorado River PBO”), available at <http://www.coloradoriverrecovery.org/documents-publications/section-7-consultation/15mile/FinalPBO.pdf>; Osmundson, Douglas B. & Patrick Nelson, USFWS, Relationships Between Flow and Rare Fish Habitat in the ‘15 Mile Reach’ of the Upper Colorado River Final Report, 6 (1995), available at <http://www.coloradoriverrecovery.org/documents-publications/technical-reports/isf/OsmundsonNelson1995.pdf> (“Osmundson 1995”).

<sup>55</sup> PBO at 4.

<sup>56</sup> BLM, Grand Junction Field Office Proposed Resource Management Plan and Final Environmental Impact Statement, Appendix A at Fig. 1-1 (2015) (“GJFO RMP-FEIS”); BLM, Colorado River Valley Field Office Map, available at [http://www.blm.gov/style/medialib/blm/co/field\\_offices/crvfo/recreation\\_maps\\_20160.Par.68989.File.dat/General\\_base\\_for\\_web.pdf](http://www.blm.gov/style/medialib/blm/co/field_offices/crvfo/recreation_maps_20160.Par.68989.File.dat/General_base_for_web.pdf) (northeast of Grand Junction Field Office).

<sup>57</sup> PBO at 36; Colorado River PBO at 31-32.

<sup>58</sup> See Osmundson 1995 at xii, 54-55, 59, Appendix IX at 33-35.

food chain and harm the predatory pikeminnow in particular. Reduced flows also alter habitat in ways that could increase nonnative fish populations. The loss of adequate flows is so serious that the Service has determined that *any* depletion of Upper Basin stream flows adversely affects and jeopardizes the endangered fish.<sup>59</sup>

Depletions within the 15-Mile Reach are especially harmful to the Colorado pikeminnow and razorback sucker. The 15-Mile Reach is “the most depleted reach on the Colorado River because it is located upstream of the Gunnison River confluence and immediately downstream of the large diversions at and above Palisade.”<sup>60</sup> Thus, reductions in flow impact this reach “to a greater degree” than other reaches.<sup>61</sup>

Compounding the threats to the endangered fish are persistent drought conditions that have diminished natural flows in the Colorado River Basin. The period from 2000 to 2015 was the lowest 16-year period for natural flow in the last century, and one of the lowest 16-year periods for natural flow in the past 1,200 years, according to paleorecords.<sup>62</sup> As a result, water storage in the Colorado River system reservoirs have declined “from nearly full to about half of capacity,” and led to local shortages in the Upper Colorado’s sub-basins.<sup>63</sup> Population growth will increase water demand for agriculture and municipal uses, making it increasingly difficult to ensure sufficient water availability for the endangered fish.<sup>64</sup> An ever widening gap between water supply and water demand is weakening the Colorado River water supply system’s reliability and ability to buffer the system in dry years.<sup>65</sup>

Climate change will continue to exacerbate natural flow and water supply shortages.<sup>66</sup> The Colorado River Basin has warmed significantly during the past century, with average increases in surface temperature of 1.6°F (0.9°C) over the Southwest during 1901-2010.<sup>67</sup> Surface temperatures in the Southwest are projected to increase steeply in this century by an average of

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<sup>59</sup> BLM, White River Field Office Proposed Resource Management Plan Amendment and Final Environmental Impact Statement for Oil and Gas Development, 3-71 (2015) (“WRFO RMPA-FEIS”) (“The FWS has determined that any federally authorized depletion from the Upper Colorado River Basin has an adverse effect on listed Colorado River fishes.”); USFWS, Biological Opinion for BLM Resource Management Plan (RMP), Price Field Office (PFO), 138 (Oct. 27, 2008) (“The USFWS determined that any depletion will jeopardize their continued existence and will likely contribute to the destruction or adverse modification of their critical habitat (citing USDI, USFWS, Region 6 Memorandum, dated July 8, 1997), available at [http://www.blm.gov/style/medialib/blm/ut/price\\_fo/Planning/rod\\_approved\\_rmp.Par.2742.File.dat/Price%20Biological%20Opinion.pdf](http://www.blm.gov/style/medialib/blm/ut/price_fo/Planning/rod_approved_rmp.Par.2742.File.dat/Price%20Biological%20Opinion.pdf); USFWS, Biological Opinion for BLM Resource Management Plan (RMP), Vernal Field Office (VFO), 113 (Oct. 23, 2008)(same), available at [http://www.blm.gov/style/medialib/blm/ut/vernal\\_fo/planning/rod\\_approved\\_rmp.Par.4719.File.dat/VernalBiologicalOpinion.pdf](http://www.blm.gov/style/medialib/blm/ut/vernal_fo/planning/rod_approved_rmp.Par.4719.File.dat/VernalBiologicalOpinion.pdf)).

<sup>60</sup> Colorado River PBO at 45.

<sup>61</sup> *Id.*

<sup>62</sup> Bureau of Reclamation, Managing Water in the West: SECURE Water Act Section 9503(c) Report to Congress, Chapter 3, Colorado River Basin , 3-6 (2016).

<sup>63</sup> *Id.*

<sup>64</sup> *See id.* at 3-7 , 3-8.

<sup>65</sup> *Id.* at 3-10, 3-12.

<sup>66</sup> *See id.* at 3-9 – 3-10.

<sup>67</sup> Hoerling et al., Present Weather and Climate: Evolving Conditions, Assessment of Climate Change: a Report Prepared for the National Climate Assessment (2013).

4.5 to 7.9° F depending on the emissions scenario, with an average of 2.5 to 3°F of warming projected for 2021-2050 alone.<sup>68</sup>

Warming temperatures are having significant effects on streamflow, drought severity, and the hydrologic cycle in the Southwest.<sup>69</sup> Hotter temperatures have resulted in dryer conditions in the spring and summer, more winter rain instead of snow, reduced spring snowpack, earlier and reduced spring runoff, and increasing frequency and severity of drought.<sup>70</sup> Importantly, numerous studies show that warming temperatures alone will cause runoff and streamflow declines in the Colorado River Basin.<sup>71</sup> According to the U.S. Geological Survey (USGS), “increased water demand and declining water availability make the restoration of endangered fish habitat extremely challenging.”<sup>72</sup>

Mercury pollution is also a serious threat to the Colorado pikeminnow. Significant new research since the 2008 PBO has demonstrated that elevated levels of mercury in Colorado pikeminnow muscle tissue, including within the Upper Colorado River Basin, are at concentrations likely to cause reproductive and behavioral impairment to the fish.<sup>73</sup> Mercury is a potent neurotoxin shown to cause numerous reproductive and endocrine impairments in fish in laboratory experiments, including effects on production of sex hormones, gonadal development, egg production, spawning behavior, and spawning success.<sup>74</sup> Concentrations of mercury in Colorado pikeminnow in the Upper Colorado basin are documented to be well in excess of the thresholds for reproductive impairment and population-level impacts.<sup>75</sup> Average mercury concentrations in Colorado pikeminnow muscle tissue 2008-09 averaged 0.60 mg/kg wet weight – well above the 0.2 mg/kg threshold of concern.<sup>76</sup> Fish and Wildlife Service’s 2015 Sufficient Progress Assessment for the Recovery Program acknowledges that population viability studies show that

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<sup>68</sup> Cayan et al., *Future Climate: Projected Average, Assessment of Climate Change: a Report Prepared for the National Climate Assessment* (2013).

<sup>69</sup> Barnett et al., *Human-Induced Changes in the Hydrology of the Western United States*, 319 *Science* 1080 (2008), Woodhouse et al., *Increasing Influence of the Air Temperature on Upper Colorado Streamflow*, 43 *Geophysical Research Letters*. (2016); *see also* Wolf, Shaye, Center for Biological Diversity, *Climate Change Impacts on Colorado River Basin Stream Flows* (2016) (“CBD Literature Review”) (Exhibit A).

<sup>70</sup> *See id.*; *see also* Bureau of Reclamation 2016 at 3-9 – 3-10.

<sup>71</sup> *See* CBD Literature Review at 2 and studies cited therein.

<sup>72</sup> USGS, *Effects of Climate Change and Land Use on Water Resources in the Upper Colorado River Basin*, 5 (2010), available at <https://pubs.usgs.gov/fs/2010/3123/pdf/FS10-3123.pdf>.

<sup>73</sup> USFWS, *Upper Colorado River Endangered Fish Recovery Program, Colorado pikeminnow (*Ptychocheilus lucius*), 5-Year Review: Summary and Evaluation 21* (2011) (“[T]he recovery goal revision needs to consider the impacts of mercury. . . the majority (64 %) of Colorado pikeminnow may be experiencing some reproductive impairment through mercury exposure.”) (“Colorado Pikeminnow 5-year Review”); USFWS, *Biological Opinion for the Four Corners Power Plant and Navajo Mine Energy Project at 76 & Table 3* (April 8, 2015) (“Four Corners Biological Opinion”).

<sup>74</sup> USFWS, *Draft 2014--2015 Assessment of Sufficient Progress Under the Upper Colorado River Endangered Fish Recovery Program in the Upper Colorado River Basin, and of Implementation of Action Items in the December 20, 1999, 15-Mile Reach Programmatic Biological Opinion and December 4, 2009, Gunnison River Basin Programmatic Biological Opinion*, 10 (Oct. 7, 2015) (“Sufficient Progress Assessment”).

<sup>75</sup> *See* Barb Osmundson and Joel Lusk, *Field assessment of mercury exposure to Colorado pikeminnow within designated critical habitat* (May 5, 2011) (“Osmundson & Lusk 2011”).

<sup>76</sup> *See* Four Corners Biological Opinion at 76 & Table 3; *see generally* Beckvar, N., T.M. Dillon, and L.B. Reads, *Approaches for linking whole-body fish tissue residues of mercury or DDT to biological effects threshold*, *Environmental Toxicology and Chemistry* 24:2094-2105 (2005).

mercury- and selenium-related reproductive impairment is likely to influence population levels in the San Juan Basin,<sup>77</sup> but no comparable analysis has yet been done for the higher levels of contamination present in Upper Colorado River Basin fish.

Mercury deposition and accumulation in critical habitat is attributable to a number of local and global factors, including air emissions from coal-fired power plants both in the immediate region and around the world.<sup>78</sup> In addition, because of discrepancies in mercury concentrations between pikeminnow in the Yampa and White Rivers, research suggests that “[i]t is possible that there is some localized sources of mercury contamination into the White River drainage connected with oil and gas exploration and development.”<sup>79</sup>

Mancos shale outcrops and soil in the Upper Colorado River Basin are a significant source of selenium pollution, which also threatens the endangered fish. Selenium harms the endangered fish and other aquatic species through bioaccumulation in the food chain. Concentrations of 3µg/g in the food chain have been found to cause gill and organ damage in certain fish and may lead to death.<sup>80</sup> Moreover, selenium bioaccumulation can result in maternal transfer of selenium to fish egg yolks and lead to developmental abnormalities.<sup>81</sup> In one study analyzing selenium concentrations of 26 fish specimens collected from designated critical habitat in the Gunnison River, one Colorado pikeminnow specimen exhibited concentrations in muscle plugs that exceeded the 8 micrograms per gram dry weight toxicity guideline for selenium in fish muscle tissue.<sup>82</sup> In another study, mean concentrations of selenium in fish in the lower Colorado River Basin exceeded the risk for maternal transfer to eggs.<sup>83</sup>

Natural erosion and runoff, as well as selenium leaching into irrigation runoff, are the primary sources of this toxic pollutant. Increased exploitation of the Mancos shale play (*see* section C below) could also put surface waters and endangered fish at risk. Selenium-laced produced water from oil and gas operations may find a pathway to surface waters via hydraulically induced fractures in Mancos shale rock, or via surface spills.

Climate change is likely to further exacerbate mercury and selenium effects on the endangered fish. Mercury deposited into soil from coal burning, or selenium naturally found in Mancos rock outcrops or soil, will increasingly run off into streams with increased heavy rainfall events.<sup>84</sup> More frequent and severe wildfire events will result in increased charring of soil, releasing mercury and selenium that can wash off into streams.<sup>85</sup> Warmer water conditions will hasten the

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<sup>77</sup> Sufficient Progress Assessment at 10-11.

<sup>78</sup> *See* Four Corners Biological Opinion at 73-74; Osmundson & Lusk 2011 at 9-10.

<sup>79</sup> *Id.* at 29.

<sup>80</sup> Lemly, A.D., Appalachian Center for the Economy & the Environment and Sierra Club, Aquatic hazard of selenium pollution from mountaintop removal coal mining, 3 (2009) (“Lemly 2009”).

<sup>81</sup> Lemly 2009 at 3.

<sup>82</sup> May, Thomas W. and Michael J. Walther, USGS, Determination of selenium in fish from designated critical habitat in the Gunnison River, Colorado, March through October, 2012, Open-File Report 2013-1104, 2 (2013).

<sup>83</sup> Walters, David M., et al. Mercury and selenium accumulation in the Colorado River food web, Grand Canyon, USA. *Environmental Toxicology and Chemistry*, 34(10):2385-2394, 2390 (2015).

<sup>84</sup> National Wildlife Federation, *Swimming Upstream: Freshwater Fish in a Warming World*, 19 (2013), available at <http://www.nwf.org/~media/PDFs/Global-Warming/Reports/NWF-Swimming%20Upstream-082813-B.ashx>.

<sup>85</sup> *Id.*

conversion of mercury into toxic methylmercury,<sup>86</sup> and reduced flows will increase mercury and selenium concentrations.

## **B. The PBO and Incidental Take Statement**

Pursuant to ESA Section 7(a)(2), BLM must ensure that oil and gas activities do not jeopardize the continued existence of listed or proposed species.<sup>87</sup> Accordingly, in May 2008, BLM initiated formal consultation with the Service under Section 7 of the ESA to consider the effects of all water use associated with ongoing and projected oil and gas development as administered by the BLM in its western Colorado field offices on the endangered fish in the Upper Colorado River Basin, excluding the San Juan River Basin (for which a separate consultation was performed). These oil and gas activities are collectively known as the Fluid Mineral Program.<sup>88</sup> In December 2008, the Service issued the Fluid Mineral PBO.

The PBO concluded that water depletions under BLM's Fluid Mineral Program are "not likely to jeopardize" the continued existence of the endangered fish or "not likely to destroy or adversely modify designated critical habitat for any of these fish."<sup>89</sup> The PBO concluded that federal oil and gas activities projected to occur between 2009 and 2024 within the White River, Grand Junction, and other western Colorado BLM planning areas would annually deplete 4,046 acre-feet of freshwater, including 379 acre-feet in the Colorado River sub-basin and 3,227 acre-feet in the White River sub-basin.<sup>90</sup> These annual depletion estimates were based on: (1) BLM's Reasonably Foreseeable Development scenarios (RFD) prepared for each of the field offices in western Colorado over the next 15 to 20 years, where an RFD had been prepared, multiplied by (2) an average depletion factor estimated by BLM for each field office.<sup>91</sup> For example, in the White River Field Office, the RFD projected an annual average of 1,232 wells would be developed per year, which was multiplied by a depletion factor of 2.62 acre-feet per well, for a total of 3,227 acre-feet annually depleted in the White River Field Office.<sup>92</sup>

With respect to the Grand Junction Field Office, a RFD had not been prepared, but BLM's Programmatic Biological Assessment (PBA) forecast a development scenario total of 1,000 federal wells and 1,200 non-federal wells over the next 15 years (through 2024).<sup>93</sup> BLM multiplied the annual average number of federal wells (67 wells) by a depletion factor of 0.77 acre-feet per well for a total annual average depletion estimate of 52 acre-feet for the Grand Junction Field Office.<sup>94</sup>

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<sup>86</sup> *Id.*

<sup>87</sup> 16 U.S.C. § 1536(a)(2).

<sup>88</sup> PBO at 1.

<sup>89</sup> *Id.* at 50.

<sup>90</sup> *Id.* at 5.

<sup>91</sup> *Id.* at 4.

<sup>92</sup> BLM, Programmatic Biological Assessment for BLM's Fluid Minerals Program in Western Colorado re: Water Depletions and Effects on the Four Endangered Big River Fishes: Colorado pikeminnow (*Ptychocheilus lucius*), humpback chub (*Gila cypha*), bonytail chub (*Gila elegans*), and razorback sucker (*Xyrauchen texanus*) (Nov. 3, 2008) ("PBA").

<sup>93</sup> *Id.* at 5.

<sup>94</sup> *Id.* at 9.

None of the PBO's depletion projections for any of the western Colorado field offices took into account the water depletion requirements of new drilling techniques, such as the water-intensive horizontal drilling now used to develop shale oil and gas resources.

In 2012, BLM prepared a RFD that made more detailed projections regarding the total oil and gas development that could occur in the Grand Junction Field Office. The RFD predicted that between 2009 and 2028, maximum total development (federal and non-federal) would be 9,116 wells, 3,938 of which would be federal wells.<sup>95</sup> 3,614 wells would be horizontally drilled to develop the Mancos-Niobrara shale plays.<sup>96</sup> 2,108 of the horizontal wells would be managed by BLM.<sup>97</sup> The RFD did not provide an average annual estimate of all federal wells (conventional and horizontal), but this amounts to 197 wells per year, or three times the annual estimate in the PBO (67 wells).<sup>98</sup> The proportionate number of horizontal wells that could be developed annually is 105 wells.

To ensure that water depletions from fluid mineral development do not result in jeopardy to the endangered fish, the Fluid Mineral PBO relies on the Upper Colorado River Endangered Fish Recovery Program—a partnership of local, state, and federal agencies, water and power interests, and environmental groups—as a reasonable and prudent measure for minimizing take that results from the Fluid Mineral Program's water depletions.<sup>99</sup> Specifically, project depletions would be offset by a one-time payment of \$74,001.34 to the Recovery Program and by “appropriate legal protection of instream flows pursuant to State law, and accomplishment of activities necessary to recover the endangered fishes as specified under the Recovery Implementation Program Recovery Action Plan [(RIPRAP)].”<sup>100</sup>

The RIPRAP establishes minimum recommended flows within various segments of the Upper Colorado River Basin that should be maintained to ensure recovery of the endangered fish.<sup>101</sup> The PBO's effects analysis assumes that, at the very least, the minimum recommended flow of 810 cubic feet per second (cfs) for dry years will be maintained within the 15-Mile Reach of the Colorado River.<sup>102</sup> According to the Service, when flows drop below 810 cfs, “habitat becomes compromised to the point that adult pikeminnow likely vacate the 15-Mile Reach to points downstream where flows increase either due to tributary input from the Gunnison River or irrigation return flow.”<sup>103</sup>

In addition to the regulatory triggers for reinitiation of consultation, the PBO specifies that failure to meet certain population recovery targets triggers reinitiation. According to the PBO, the “RIPRAP is expected to result in a positive population response for the four endangered

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<sup>95</sup> BLM, Reasonably Foreseeable Development Scenario for Oil and Gas, Grand Junction Field Office, 44-46 (2012) (“GJFO RFD”).

<sup>96</sup> *Id.* at 19, 35, 44, 46.

<sup>97</sup> GJFO RFD at 16, 44, 46; GJFO RMP-FEIS at 4-3.

<sup>98</sup> GJFO RMP-FEIS at 4-3, 4-448.

<sup>99</sup> *See* PBO at 7-8, 51.

<sup>100</sup> *Id.* at 7-8.

<sup>101</sup> *See id.* at 41; Colorado River PBO at 54.

<sup>102</sup> PBO at 42, 48.

<sup>103</sup> *See* Sufficient Progress Assessment at 34-35; *see also* Osmundson 1995 at 32.

fishes in the Upper Colorado River Basin.”<sup>104</sup> However, “[i]f such a positive population response for any of these species is not realized, as measured by the criteria outlined in the RIPAP, this would be considered new information that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion,” and would trigger reinitiation.<sup>105</sup>

In 2002, the Service established recovery goals for the endangered fish, including criteria for “downlisting” the species from “endangered” to “threatened” status and for delisting the species.<sup>106</sup> These criteria have since been incorporated into the RIPRAP and are presumably the criteria by which a “positive population response” is measured.<sup>107</sup> At the time, the Service estimated that downlisting of the Colorado pikeminnow and humpback chub could be proposed by 2006 and 2007, and that delisting could be proposed by 2013 and 2010, respectively.<sup>108</sup>

The PBO also incorporates the reinitiation terms of the “Colorado River PBO.”<sup>109</sup> The Colorado River PBO encompasses projects that deplete water from the Colorado River above the confluence with the Gunnison River, including water depletions from and above the 15-Mile Reach.<sup>110</sup> For “[p]rojects that fall under the umbrella of the Colorado River PBO,” reinitiation is required if new information shows “the lack of a positive population response by the year 2015 or when new depletions reach 50,000 acre-feet/year.”<sup>111</sup> A positive response “would require the adult Colorado pikeminnow population estimate to be 1,100 individuals (+/-250) in the Colorado River (Rifle Colorado to the confluence with the Green River).”<sup>112</sup>

The PBO’s incidental take statement makes water depletion a surrogate of take, given the difficulty of estimating the number of individual fish that would be taken as a result of water depletions.<sup>113</sup> The PBO sets a limit on incidental take for the entire Upper Colorado River Basin, as well as a limit for individual sub-basins. It “exempt[s] all take in the form of harm that would occur from the depletion of water from the occupied habitats listed above [i.e., various sub-basins]. Water depletions above the amounts addressed in this biological opinion would exceed the anticipated level of incidental take and are not exempt from the prohibitions of Section 9 of the ESA.”<sup>114</sup> The overall threshold for the entire Basin is 4,046 acre-feet per year; for the Colorado River sub-basin 379 acre-feet per year; and for the White River sub-basin 3,227 acre-feet per year.<sup>115</sup>

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<sup>104</sup> PBO at 52.

<sup>105</sup> *Id.*

<sup>106</sup> *See, e.g.*, USFWS, Colorado pikeminnow (*Ptychocheilus lucius*) Recovery Goals: amendment and supplement to the Colorado Squawfish Recovery Plan (2002) (“Pikeminnow Recovery Goals”); USFWS, Humpback chub (*Gila cypha*) Recovery Goals: amendment and supplement to the Humpback Chub Recovery Plan at 4 (2002) (“Humpback Chub Recovery Goals”).

<sup>107</sup> Sufficient Progress Assessment at 4.

<sup>108</sup> Pikeminnow Recovery Goals at 51; Humpback Chub Recovery Goals at 51.

<sup>109</sup> PBO at 51-55.

<sup>110</sup> *See* PBO at 3; GJFO RMP-FEIS, Appendix A at Fig. 1-1.

<sup>111</sup> PBO at 52.

<sup>112</sup> *Id.*

<sup>113</sup> *Id.* at 51.

<sup>114</sup> *Id.*

<sup>115</sup> *Id.* at 5.



The PBO requires BLM to “track all projects that result in water depletions from the upper Colorado River Basin” and “submit a log of all water depleting projects by river sub-basin to the Service by October 31 of each year.”<sup>116</sup> These logs are “used to track compliance with the [PBO’s] threshold depletion amount.”<sup>117</sup> Generally, BLM does not track or report actual water use of wells or even projected water use for proposed wells. Instead, it tracks and reports the number of wells and multiplies it by the depletion factor estimate in the PBO.<sup>118</sup> In 2011, however, it began tracking and reporting actual water use of horizontal wells.<sup>119</sup>

The Fluid Mineral PBO does not evaluate climate change effects on stream flows and the endangered fish.

### **C. Development of the Mancos Shale Play and Horizontal Drilling**

Development of the Mancos shale play in the Piceance Basin, as well as new drilling techniques, will greatly exacerbate the water depletion impacts to the endangered fish. The Piceance Basin spans seven counties in northwest Colorado, and contains vast “tight” natural gas reserves, which require extraction via hydraulic fracturing or other unconventional methods.<sup>120</sup> In recent years, the most productive area of the Basin has been the Mesaverde Group, which consists of multiple underground formations,<sup>121</sup> but exploration of the underlying Mancos Formation has revealed enormous development potential of these deeper shale gas reserves.<sup>122</sup> According to BLM, “recent plays in the Niobrara and Mancos Formations are returning consistently high production values.”<sup>123</sup> The Niobrara Formation is a lower member of the Mancos Formation.

Profitable exploitation of the Mancos and Niobrara Formations (collectively, “Mancos shale play”) is enabled by three recent technological advances—hydraulic fracturing or “fracking,” horizontal drilling, and multi-stage fracking. Hydraulic fracturing, a dangerous practice in which operators inject toxic fluid underground under extreme pressure to produce fractures that release oil and gas, has greatly increased industry interest in developing shale oil and gas deposits that would otherwise be uneconomic to extract. While the main ingredient in fracturing fluid (or

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<sup>116</sup> *Id.*

<sup>117</sup> *Id.*

<sup>118</sup> See BLM, Water Depletion Logs FY2009-FY2015 (Exhibit B) (“Water Depletion Logs”).

<sup>119</sup> See n.132-133 below & accompanying text.

<sup>120</sup> See BLM, Reasonably Foreseeable Development Scenario for Oil and Gas Activities in the BLM White River Field Office, 10, 13 (maps of Piceance Basin), 15-17, 22.

<sup>121</sup> *Id.* at 15-17, 22; BLM, Colorado River Valley Field Office – Proposed RMP/Final EIS, 3-178 (2014) (“CRVFO RMP-FEIS”).

<sup>122</sup> See, e.g., GJFO RFD at 16 (Mancos/Mowry shales “have proven attractive targets for drilling in recent years,” beginning in 2009 and are “most likely to be developed for shale gas resource plays”); *id.* Fig. 9a, 31, 46 (showing large portions of Grand Junction Field Office have “very high,” “high,” and “moderate” potential for development, and up to 3,614 wells are projected to be drilled in these areas); GJFO RMP-FEIS at 3-186 (noting “increasing interest in horizontal drilling in the Mancos/Mowry shale play”); *id.* (since 2010 approximately 50 percent of drilling applications within the Grand Junction planning area have been for horizontal drilling targeting this shale play”); Webb, Dennis, Industry: Thompson area well is a gusher, Grand Junction Sentinel (Jan. 5, 2016) (noting reportedly “highly productive results” from Mancos shale wells in recent years), available at <http://www.gjsentinel.com/news/articles/industrythompsonareawellisagusher>; GJFO RFD at 8, 71 (noting location of Mancos relative to other formations).

<sup>123</sup> CRVFO RMP-FEIS at 3-178.

“frack fluid”) is generally water,<sup>124</sup> a mixture of chemicals is used, for purposes such as increasing the viscosity of the fluid or impeding bacterial growth or mineral deposition.<sup>125</sup> The human health and environmental impacts of the chemicals injected in the fracking process are not completely understood, in large part because operators are not required to publicly disclose what they are injecting.<sup>126</sup>

Accordingly, hydraulic fracturing can involve the transport of thousands of pounds of chemicals to a single well site and the production of millions of gallons of wastewater from a single well. This includes highly toxic frack fluid that returns to the surface after it is injected (known as “flowback”) and brine water that discharges from the fractured formation (known as “produced water”). These wastewaters may be laced with naturally occurring radionuclides, heavy metals, and hydrocarbons that are carried to the surface from the underground formation.

The second technological development underlying the recent shale boom is the use of horizontal drilling, which enables economic extraction of thin layers of shale that are not profitable to extract via vertical drilling and hydraulic fracturing alone.<sup>127</sup> By drilling down and then sideways along the shale formation, a company can extract resources from a much higher volume of shale for the same amount of drilling through the overburden.<sup>128</sup>

A third technological development is the use of “multi-stage” fracking, which enables the extraction of oil and gas resources from longer horizontal wellbores.<sup>129</sup> In multi-stage fracking, the operator treats only part of the wellbore at a time, typically 300 to 500 feet.<sup>130</sup> Each stage “may require 300,000 to 600,000 gallons of water,” and consequently, a frack job that is two or more stages can contaminate and pump into the ground over a million gallons of water.<sup>131</sup> Horizontal drilling therefore typically requires much greater volumes of water than vertical drilling.

In 2008, when the Fluid Mineral PBO was adopted, BLM had not yet recognized the development potential of the Mancos and Niobrara shale plays, nor the potential for deployment of horizontal drilling and multi-stage fracking within the Piceance Basin and their water

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<sup>124</sup> Arthur, Daniel J, Hydraulic Fracturing Considerations for Natural Gas Wells of the Marcellus Shale, Presented at The Groundwater Protection Council, 2008 Annual Forum, Cincinnati, Ohio (2008); United States House of Representatives, Committee on Energy and Commerce, Minority Staff, Chemicals Used in Hydraulic Fracturing (Apr. 2011).

<sup>125</sup> Arthur at 10.

<sup>126</sup> See, e.g., Colorado Oil and Gas Conservation Commission (COGCC) Rule 205A(b)(2)(B)-(D) (exempting chemical identities and concentrations claimed as trade secrets from public disclosure, without requiring factual substantiation); see also COGCC Form 41, [https://cogcc.state.co.us/forms/PDF\\_Forms/Form41\\_05312012.pdf](https://cogcc.state.co.us/forms/PDF_Forms/Form41_05312012.pdf).

<sup>127</sup> *Id.*

<sup>128</sup> Venoco, Inc., Monterey Shale Focused Analyst Day Slide Show at 23 (May 26, 2010); U.S. Energy Information Administration, Annual Energy Outlook 2012 with projections to 2035, 63 (2012).

<sup>129</sup> New York Department of Environmental Conservation, Final Supplemental Generic Environmental Impact Statement on the Oil, Gas and Solution Mining Regulatory Program, 5-1, 5-87-89 (2015).

<sup>130</sup> *Id.* at 5-87.

<sup>131</sup> *Id.*

depletion effects.<sup>132</sup> The PBO therefore does not at all account for the water depletion impacts of horizontal drilling and associated multi-stage fracking.

Recognizing this problem in 2011, BLM began tracking actual “net” freshwater use of horizontal wells (excluding reused or recycled water) to “allow the BLM to calculate the total depletion amount for horizontal wells by river basin **and** provide information on how much water is depleted by an “average” horizontal well.”<sup>133</sup>

Water depletion logs submitted by BLM to the Service show far higher average water use for horizontal wells than that estimated for vertical wells. While vertical and non-horizontal directional wells in the Grand Junction and White River Field Offices are estimated to require 0.77 and 2.62 acre-feet of water on average per well, respectively, horizontal drilling typically entails fresh water depletion many times greater than this amount. For example, the average water use of horizontal drilling projects from FY2011-FY2014 in the Field Offices covered by the PBO was 13.34 acre-feet of water.<sup>134</sup>

In addition, water depletion logs submitted by BLM to the Service on February 4, 2016 shows that in FY2015, nine horizontal wells were drilled in the Grand Junction Field Office and consumed an average of 68.98 acre-feet of water or a total of 620.87 acre-feet of water.<sup>135</sup> The total amount of water depleted in the Colorado River *sub-basin* by all horizontal and vertical wells was 691.09 acre-feet of water, which exceeds the 379 acre-feet annual projection for this sub-basin by 1.8 times.<sup>136</sup> Between FY2014 and FY2015, operator Black Hills Plateau Production, LLC (Black Hills), drilled 10 horizontal wells, which each averaged 75.48 acre-feet per well.<sup>137</sup>

Recently, on June 8, 2016, the U.S. Geological Survey published a report re-assessing the total technically recoverable reserves in the Mancos shale play in the Piceance Basin, including the Niobrara strata of the play.<sup>138</sup> According to the report, the Mancos shale play’s total technically recoverable natural gas reserves are over 40 times greater than the USGS’s 2003 estimate and is the second-largest in the U.S., behind the Marcellus shale.<sup>139</sup> Specifically, 66.3 trillion cubic feet of natural gas, 74 million barrels of oil and 45 million barrels of natural gas liquids are potentially recoverable.<sup>140</sup> Increasing interest in the Piceance Basin’s Mancos shale play should

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<sup>132</sup> See BLM Instruction Memorandum CO-2011-022 (April 1, 2011) (“All of the estimates in the PBO were based on using conventional vertical drilling technology.”).

<sup>133</sup> *Id.* (emphasis in original).

<sup>134</sup> Water Depletion Logs.

<sup>135</sup> *Id.*

<sup>136</sup> This includes five wells in the Colorado River Valley Field Office, all of which were drilled in the Colorado River sub-basin and depleted 1.82 to 2.83 acre-feet per well. The average horizontal well depletion for all wells in the sub-basin in FY2015 was 45.18 acre-feet.

<sup>137</sup> Water Depletion Logs.

<sup>138</sup> USGS, Assessment of Continuous (Unconventional) Oil and Gas Resources in the Late Cretaceous Mancos Shale of the Piceance Basin, Uinta-Piceance Province, Colorado and Utah (2016) (“USGS 2016”), available at <http://pubs.usgs.gov/fs/2016/3030/fs20163030.pdf>.

<sup>139</sup> See *id.*; see USGS, USGS Estimates 66 Trillion Cubic Feet of Natural Gas in Colorado’s Mancos Shale Formation (June 2016), available at <https://www.usgs.gov/news/usgs-estimates-66-trillion-cubic-feet-natural-gas-colorado-s-mancos-shale-formation> (“USGS 2016 Press Release”).

<sup>140</sup> USGS 2016.

therefore be expected, given its enormous production potential. Indeed, since the 2003 USGS assessment, more than 2,000 wells have already been drilled and completed in one or more intervals of the study area.<sup>141</sup>

While tight gas in the younger, shallower Mancos shale intervals is produced primarily from vertical and directional wells in which the reservoirs have been hydraulically fractured, the tight gas and continuous oil and gas in the older and deeper intervals of the Mancos shale are produced mostly from horizontal wells that have been hydraulically fractured.<sup>142</sup> A review of BLM oil and gas projects in western Colorado indicates that operators are planning a number of projects involving horizontal drilling, which would most likely target the Mancos shale.<sup>143</sup>

#### **D. BLM and the Service's Section 7 Consultation on the Grand Junction and White River Management Plans**

On August 10 and August 17, 2015, BLM approved a revised Resource Management Plan (RMP) for the Grand Junction Field Office and oil and gas amendments to the White River Field Office RMP, respectively. The Grand Junction RMP projects that 3,940 federal wells could be developed through 2029, 2,108 of which could be horizontal wells specifically to develop the Mancos shale play.<sup>144</sup> Under the White River RMP, up to 15,040 federal wells could be drilled through 2028.<sup>145</sup> An unknown number of these wells could be horizontal wells, but the White River RMP does not project potential development of the Mancos shale play, so the actual amount of drilling could be much higher.<sup>146</sup> Numerous non-federal wells or wells on private lands could also be developed within the planning areas—up to 5,178 and 2,057 wells in the Grand Junction and White River Field Offices respectively.<sup>147</sup>

For each RMP, BLM prepared a draft and final Environmental Impact Statement (EIS) regarding the RMPs' significant environmental effects, pursuant to the National Environmental Policy Act (NEPA). Neither EIS projected potential water use of horizontal wells required for development of the Mancos shale play.

In addition, BLM completed a Biological Assessment (BA) for each RMP concerning the effects of RMP implementation, including projected oil and gas drilling, on the endangered fish and other listed species. In the Grand Junction BA, BLM found that implementing the RMP “may affect, is likely to adversely affect” the endangered fish and their critical habitat, thereby initiating formal consultation.<sup>148</sup> BLM's rationale noted that water depletion activities were “likely to adversely affect” the endangered fish.<sup>149</sup> However, without stating what development scenario it assumed or acknowledging the Grand Junction RFD's revised well projections, it

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<sup>141</sup> *Id.*

<sup>142</sup> *Id.*

<sup>143</sup> See Center for Biological Diversity, Spreadsheet of Horizontal Well Projects in Colorado (listing horizontal well projects listed in BLM's NEPA register and projected water use) (Exhibit C).

<sup>144</sup> See GJFO RMP-FEIS at 4-3, 4-448.

<sup>145</sup> WRFO RMPA-FEIS at 2-29.

<sup>146</sup> See generally WRFO RFD.

<sup>147</sup> GJFO RFD at 44, 46; WRFO RFD at 36.

<sup>148</sup> BLM, GJFO Approved RMP, Appendix P, Biological Assessment, 5-3 – 5-4 (October 2014) (“GJFO BA”).

<sup>149</sup> *Id.*

concluded “[t]he effects under the RMP would not exceed those consulted on in the programmatic BOs.”<sup>150</sup>

With respect to accidental spills and leaks, the BA only stated “BLM does not authorize these accidents,” conservation measures in the RMP would “reduce the risk of these occurrences,” and BLM would initiate emergency consultation with the Service “[i]n the rare and unlikely event of a spill,” suggesting consultation over spill effects in advance is not required.<sup>151</sup>

On April 27, 2015, the Service issued a Biological Opinion concurring in BLM’s “likely to adversely affect” finding, and found that water depletion effects of oil and gas activities allowed under the Grand Junction RMP were already addressed in the Fluid Mineral PBO.<sup>152</sup> The Service’s Biological Opinion did not include a separate determination as to the effect of other oil and gas activities on the endangered fish, such as the effects of accidental spills and leaks, and it is unclear whether the Service’s concurrence adopted the BA’s findings as to spill effects.

In the White River BA, BLM found that “flow depletion attributable to fluid mineral development may affect, is likely to adversely affect...[the endangered fish],” and that “[i]ssues involving...deterioration of water quality,” such as leaks and spills, “may affect, but are not likely to adversely affect... [the endangered fish].”<sup>153</sup> On March 11, 2015, in a letter to BLM, the Service concurred in these determinations and found that the effects of water depletions “have undergone separate Section 7 consultation,” referring to the Fluid Minerals PBO.<sup>154</sup>

In April 2015, Center for Biological Diversity, Living Rivers, and Rocky Mountain Wild submitted a formal protest against the White River RMP, and in May 2015 Center for Biological Diversity and Living Rivers protested the Grand Junction RMP. Both protests objected that the EISs failed to adequately study the water depletion effects of hydraulic fracturing and horizontal drilling within the two planning areas and their cumulative effects, the spill effects of increased fracking, and the RMPs’ cumulative greenhouse gas emissions and social cost of carbon.<sup>155</sup> In addition, both protests raised BLM and the Service’s failure to adequately consult over spill and water depletion effects on the endangered fish, and the need to reinitiate consultation on the Fluid Mineral PBO because of its failure to take into account the water depletion effects of horizontal drilling and hydraulic fracturing. BLM denied the protests at the time it issued the records of decision.<sup>156</sup>

## **E. New Information Arising Since BLMs’ Adoption of the RMPs**

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<sup>150</sup> GJFO BA at 5-4.

<sup>151</sup> *Id.*

<sup>152</sup> GJFO Approved RMP, Appendix Q, Grand Junction Biological Opinion, 3-4 (April 27, 2015) (“GJFO BO”).

<sup>153</sup> White River PRMPA/FEIS, Revised Biological Assessment (February 2015), 4-64 (“WRFO BA”).

<sup>154</sup> USFWS, Memo to BLM re: Section 7 Consultation on the White River Resource Management Plan, 4 (March 11, 2015) (“Service Concurrence”).

<sup>155</sup> *See* Exhibits D & E.

<sup>156</sup> *See* BLM, Director’s Protest Resolution Report, White River (Colorado) Oil and Gas Proposed Resource Management Plan Amendment and Final Environmental Impact Statement (Aug. 17, 2015); BLM, Director’s Protest Resolution Report, Grand Junction (Colorado) Oil and Gas Proposed Resource Management Plan Amendment and Final Environmental Impact Statement (Aug. 10, 2015).

Since BLM's adoption of the Grand Junction and White River RMPs in August 2015, additional new information has arisen indicating that water depletions from oil and gas development may affect the endangered fish in a manner or to an extent not previously considered in the PBO and in the agencies' consultations over the RMPs.

First, as discussed above, in February 2016 BLM submitted to the Service a water depletion log indicating that water depletions from a number of horizontal wells authorized and drilled in FY2015 in the Grand Junction Field Office have collectively resulted in exceedance of the depletion threshold for the Colorado River sub-basin, which also serves as the surrogate limit for incidental take in the sub-basin.<sup>157</sup>

Second, in March 2016, scientists at the University of Arizona published the first study to empirically detect a temperature effect on stream flows in the Colorado River Basin indicating that rising spring temperatures due to climate change are already reducing stream flows in the Basin.<sup>158</sup>

Third, as noted above, in June 2016, the USGS dramatically increased its estimate of natural gas and oil reserves in the Piceance Basin's Mancos shale play in western Colorado, which includes areas of the White River, Grand Junction, Colorado River Valley, Uncompahgre, and Gunnison Field Offices.<sup>159</sup> The study represents the "second-largest assessment of potential shale & tight gas resources that the USGS has ever conducted."<sup>160</sup>

Fourth, on October 7, 2015, the Service finalized its annual Sufficient Progress Assessment evaluating the Recovery Program's progress in recovering the endangered fish. The assessment published 2014 population estimates for the Colorado pikeminnow and humpback chub, which indicated: (1) a decline in Colorado pikeminnow in the Colorado River sub-basin and a failure to meet the abundance criteria for this sub-population by 2015;<sup>161</sup> (2) a decrease in Colorado pikeminnow "throughout the entire Green River Subbasin" indicating a continued failure to achieve the minimum viable population for this sub-population;<sup>162</sup> (3) a continued failure to establish a "core population" of humpback chub in the Black Rocks/Westwater and Desolation/Gray Canyons sub-populations, whose numbers remain below the minimum viable population;<sup>163</sup> and (4) a failure to establish self-sustaining populations of the smaller Yampa Canyon and Cataract Canyon humpback chub sub-populations.<sup>164</sup>

The Sufficient Progress Assessment also noted the Recovery Program's failure to meet the drought-year monthly average flow recommendation of 810 cfs in 2012 and 2013 for the 15-Mile

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<sup>157</sup> See Water Depletion Logs.

<sup>158</sup> Woodhouse, C. A., G. T. Pederson, K. Morino, S. A. McAfee, and G. J. McCabe, Increasing influence of air temperature on upper Colorado River streamflow, *Geophys. Res. Lett.* 43, doi:10.1002/2015GL067613 (2016); see also American Geophysical Union, Colorado River Flows Reduced by Warmer Spring Temperatures (March 9, 2016), available at <http://news.agu.org/press-release/colorado-river-flows-reduced-by-warmer-spring-temperatures/>.

<sup>159</sup> USGS 2016.

<sup>160</sup> USGS Press Release.

<sup>161</sup> Sufficient Progress Assessment at 4-6, 36.

<sup>162</sup> *Id.* at 6-7.

<sup>163</sup> *Id.* at 11-14.

<sup>164</sup> *Id.* at 11, 14-15.

Reach.<sup>165</sup> Further, although 2015 was a “dry-average” precipitation year, the monthly average recommended flow of 1,240 cfs for dry-average years was not met in the 15-Mile Reach in August and October 2015.<sup>166</sup>

Finally, the Sufficient Progress Assessment noted that mercury pollution effects on the endangered fish “may pose a more significant threat to Colorado pikeminnow populations of the upper Colorado River basin than previously recognized.”<sup>167</sup> In recent years, the highest mercury concentrations were found in the largest adults collected from the Green and Colorado River sub-basins.<sup>168</sup>

### **III. VIOLATIONS**

#### **A. BLM and the Service Failed to Reinitiate ESA Section 7 Consultation on Water Depletions Associated with BLM’s Fluid Minerals Program within the Upper Colorado River Basin Despite New Information and Modifications**

Reinitiation of consultation is required when “new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered, or “[i]f the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the biological opinion.”<sup>169</sup> New information and/or circumstances regarding (1) the water depletion associated with horizontal drilling and increased development potential of the Mancos shale play, (2) the impact of climate change on stream flows, (3) the Recovery Program’s failure to meet recommended baseline flows in the 15-Mile Reach, and (4) mercury and selenium pollution effects on the Colorado pikeminnow, trigger reinitiation of consultation on BLM’s Fluid Mineral Program.

##### ***1. Increased Water Depletions May Affect the Endangered Fish and their Critical Habitat in a Manner and to an Extent Not Previously Considered***

BLM and the Service must reinitiate consultation over the Fluid Mineral Program in light of new information indicating the potential for increased water use from horizontal drilling, and increased development potential of the Mancos Shale Play, the development of which requires horizontal drilling.

Under the PBO, the proposed action “consists of water use associated with ongoing and projected fluid mineral development as administered by the BLM in Colorado.”<sup>170</sup> But this water

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<sup>165</sup> *Id.* at 28, 34-35.

<sup>166</sup> USGS Surface Water Data for Colorado: USGS Surface Water Monthly Statistics for “USGS 09106150 COLO RIVER BELOW GRAND VALLEY DIV NR PALISADE, CO,” available at [http://waterdata.usgs.gov/nwis/monthly?referred\\_module=sw&site\\_no=09106150&por\\_09106150\\_15=345584,00060,15,1990-10,2016-02&format=html\\_table&date\\_format=YYYY-MM-DD&rdb\\_compression=file&submitted\\_form=parameter\\_selection\\_list](http://waterdata.usgs.gov/nwis/monthly?referred_module=sw&site_no=09106150&por_09106150_15=345584,00060,15,1990-10,2016-02&format=html_table&date_format=YYYY-MM-DD&rdb_compression=file&submitted_form=parameter_selection_list) (last visited July 7, 2016) (stream flows) (Exhibit F).

<sup>167</sup> Sufficient Progress Assessment at 10.

<sup>168</sup> *Id.*

<sup>169</sup> 50 C.F.R. § 402.16(b), (c).

<sup>170</sup> PBO at 4.

use may be far higher than contemplated in the PBO, due to a significantly increased projection of wells in the Grand Junction planning area, increased horizontal drilling and hydraulic fracturing in the Piceance Basin (including the Grand Junction and White River Field Offices) not considered in the PBO, and higher average water use estimates for horizontal drilling previously unaccounted for in the PBO. Specifically, the following new information indicates that the Fluid Mineral Program's water depletion effects would be higher than the PBO previously considered:

- In 2012, BLM updated the Reasonably Foreseeable Development Scenario for the Grand Junction planning area, estimating an average of 197 federal wells would be developed within the Grand Junction Field Office per year, almost three times the PBO's estimate of 67 wells per year.<sup>171</sup>
- Further, the Grand Junction RFD projected that over half of these wells would be horizontal wells to develop the Mancos shale play, which amounts to an annual average of 105 horizontal wells per year.<sup>172</sup>
- Horizontal wells consume far more water than the amount estimated for vertical wells—13.34 acre-feet compared to 0.77 acre-feet, or over seventeen times that projected for vertical wells, according to water depletion logs submitted by BLM to the Service for FY2011 through FY2014.<sup>173</sup> Further, BLM's most recent water depletion log for FY2015 shows that average water depletions from nine horizontal wells targeting the Mancos Formation was 68.99 acre-feet of water.<sup>174</sup> Averaging these numbers with the FY2011-FY2014 figures, the average depletion is 26.45 acre-feet per well. The drastic increase in the use of this water-intensive drilling technique was not considered in the PBO.
- In 2015, BLM noted in the final EIS for the White River RMP that exploratory drilling of the Mancos shale play within the White River Field Office would occur, and that “exploratory wells outside the [Mesaverde Play Area], particularly horizontal completions, may result in water use significantly above the [PBO's water depletion] estimate.”<sup>175</sup>

Taking into account this new information, water depletions for the Fluid Mineral Program and/or for a particular sub-basin could exceed the PBO's depletion estimate by many times. For example, assuming that 96% of the horizontal wells that could be drilled in the Grand Junction Field Office are drilled in the Colorado River sub-basin (the same proportion assumed in the PBO),<sup>176</sup> and using a conservative depletion factor of 13.34 acre-feet per horizontal well, the total depletion from horizontal wells within the Grand Junction Field Office alone would exceed

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<sup>171</sup> Compare GJFO RFD at 44, 46 (1,831 conventional wells + 2,107 horizontal wells over 20 years = 197 wells per year) with PBA at 9 (1000 wells over 15 years = 67 wells per year).

<sup>172</sup> GJFO RFD at 44, 46 (2,107 horizontal wells managed by BLM over 20 years results in an annual average of 105 wells) ; see also GJFO RMP-FEIS at 4-448.

<sup>173</sup> See Water Depletion Logs (Exhibit B).

<sup>174</sup> *Id.*

<sup>175</sup> WRFO RMPA-FEIS at 4-120.

<sup>176</sup> See PBA at 10.



the depletion threshold for the Colorado River sub-basin by over three times. Total depletion could be far higher, as this figure does not include vertical wells in the Grand Junction Field Office or wells in any other field office within the Colorado River sub-basin.

The PBO must also be updated in light of the USGS's updated estimate of technically recoverable oil and gas reserves in the Piceance Basin's Mancos shale play. Specifically:

- The Mancos shale play's natural gas reserves are 40 times greater than previously estimated in the USGS's 2003 study, and contains significant oil and liquid gas reserves.<sup>177</sup>
- These reserves underlie large areas of the Grand Junction, White River, Colorado River Valley, Uncompahgre, and Gunnison Field Offices, all of which fall under the PBO.<sup>178</sup>
- Because the RMPs for these field offices do not limit total new wells that may be drilled, the greater amount and availability of technically recoverable oil and gas reserves could result in the development of many more new wells in the Upper Basin than assumed in the RMPs and the PBO. For example, the RFDs for the Colorado River Valley and White River RMPs did not take into account Mancos shale drilling (other than exploratory wells) and thus such drilling is not considered in the PBO. At the time BLM last updated these RMPs, BLM deemed such development too speculative or only exploratory in nature.<sup>179</sup>
- A substantial portion of new wells would be horizontal wells, as the lower strata of the Mancos formation would likely be accessed via horizontal drilling, but again, the PBO does not take into account the extraordinarily higher water use for horizontal wells.

In sum, water use for development of horizontal wells and the Mancos shale play is likely to far exceed the PBO's water depletion projections for the Fluid Mineral Program. BLM and the Service must reinitiate consultation on the Fluid Mineral Program in light of new evidence that increased water use may affect the endangered fish and its critical habitat in a manner and to an extent not previously considered.<sup>180</sup> Further, by authorizing and approving the development of horizontal wells and exploitation of the Mancos shale play, BLM has modified the Fluid Mineral

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<sup>177</sup> USGS 2016.

<sup>178</sup> See Center for Biological Diversity, USGS Map of Mancos Shale Play and Western Colorado BLM Field Offices (Exhibit G).

<sup>179</sup> See WRFO RMPA-FEIS at K-358 ("Development of the Mancos and Niobrara outside the Rangely Field in Rio Blanco County in the WRFO are not [] currently well defined and are exploratory in nature. This development is in the initial stages of the exploration phase to determine of the maturity of the reservoir and the potential viability of the Niobrara within the WRFO."); CRVFO RMP-FEIS at 4-576 ("To date, use of horizontal drilling in relation to the deep marine shales [i.e., Niobrara, Mancos, and Eagle Basin formations] has been limited and is considered experimental. As a result, the development intensity, timing, and location of development of the deep marine shales was considered too speculative for quantitative impact analysis in connection with this planning process.").

<sup>180</sup> 50 C.F.R. § 402.16(b).

Program “in a manner that causes an effect to the listed species or critical habitat that was not considered in the biological opinion,” and must reinitiate consultation.<sup>181</sup>

## ***2. New Information Reveals Climate Change May Affect the Endangered Fish and Their Critical Habitat in a Manner and to an Extent Not Previously Considered***

The PBO does not analyze or even mention climate change and its potential to reduce stream flows in the Upper Basin, which could amplify the effects of water depletions on the endangered fish and reduce the effectiveness of the Recovery Program (e.g., by reducing the availability of water to supplement natural flows in dry years). The best available scientific data indicate that climate change is resulting in higher temperatures in the Colorado River Basin, reduced snowpack, diminished runoff, and more frequent and intense droughts, which have already reduced and will continue to reduce stream flows in the Basin.<sup>182</sup> The most recent study concerning these effects was published on March 9, 2016. As described in the Center’s attached literature review regarding climate change effects on stream flows (Exhibit A):

An empirical study of the influence of precipitation, temperature, and soil moisture on upper Colorado River basin streamflow over the past century found that warmer temperatures have already resulted in flows less than expected based on precipitation levels (Woodhouse et al. 2016). Consistent with past research, the study found that cool season precipitation explains most of the variability in annual streamflow. However, temperature was highly influential in determining streamflow under certain conditions. The study concluded that “[s]ince 1988, a marked increase in the frequency of warm years with lower flows than expected, given precipitation, suggests continued warming temperatures will be an increasingly important influence in reducing future UCRB water supplies.” The researchers warned that “streamflow forecasts run the risk of overprediction if warming spring and early summer temperatures are not adequately considered.”<sup>183</sup>

According to the study’s press release it is the “first to examine the instrumental historical record to see if a temperature effect [on stream flows] could be detected.”<sup>184</sup> The study’s lead author highlighted its significance: “If we have a warmer spring, we can anticipate that the flows will be less relative to the amount of snowpack[.]...What we’re seeing is not just the future – it’s actually now. That’s not something I say lightly.”<sup>185</sup>

BLM and the Service must reinitiate consultation on the Fluid Mineral Program in light of new evidence that climate change and warming temperatures are reducing Colorado River stream

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<sup>181</sup> *Id.* § 402.16(c).

<sup>182</sup> CBD Literature Review.

<sup>183</sup> *Id.* at 2.

<sup>184</sup> American Geophysical Union, Colorado River Flows Reduced by Warmer Spring Temperatures (March 9, 2016), available at <http://news.agu.org/press-release/colorado-river-flows-reduced-by-warmer-spring-temperatures/>.

<sup>185</sup> *Id.*

flows and may affect the endangered fish and its critical habitat in a manner and to an extent not previously considered.<sup>186</sup>

### **3. Reduced Baseline Flows Require Reinitiation of Consultation**

A consistent pattern of failing to meet recommended flows in the Colorado River's 15-Mile Reach requires BLM and the Service to reinitiate consultation over the Fluid Mineral Program. In its discussion of the environmental baseline, the Fluid Mineral PBO notes various recommended flows for the Colorado River sub-basins, including minimum flows for wet years, wet-average years, dry-average years, and dry years.<sup>187</sup> The PBO notes that in some recent years, recommended flows have not been met in the 15-Mile Reach.<sup>188</sup> However, the PBO's effects analysis assumes that the lowest recommended flow for dry years (810 cfs) will be maintained; this minimum flow is the baseline by which the PBO determined the Fluid Mineral Program's depletion effects on the Colorado pikeminnow.<sup>189</sup>

The Endangered Fish Recovery Program's latest Sufficient Progress Assessment indicates that recommended flows for dry years in the 15-Mile Reach of the Colorado River were not met in 2012 and 2013.<sup>190</sup> Flows also fell short of recommended levels in 2015, despite it being a dry-average precipitation year. In April, May, August and October 2015, the 15-Mile Reach missed the recommended minimum average flows for those months for dry-average precipitation years.<sup>191</sup> This average year shortfall (following a "wet-average" year) strongly suggests that minimum recommended flows for later dry years will almost certainly not be met when water will be scarcer, and as declining stream flows overall due to climate change weaken the Recovery Program's ability to supplement natural flows in dry years.<sup>192</sup> Indeed, in the period since the PBO was adopted, between 2009 and 2015, the Recovery Program has failed to meet mean monthly recommended flows in the 15-Mile Reach in over half of all months.<sup>193</sup> This new information strongly suggests that critical habitat within the 15-Mile Reach is likely to be unsuitable for the Colorado pikeminnow and razorback sucker in dry years, and that flow depletions from oil and gas development will only exacerbate these unsuitable conditions and reduce these species' chances of recovery.

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<sup>186</sup> 50 C.F.R. § 402.16(b).

<sup>187</sup> PBO at 41-44.

<sup>188</sup> See *id.* at 42-44 (e.g., "Since the publication of the spring flow recommendations in 1991, peak 1-day average flows through the 15-mile reach have been below 12,900 cfs approximately one-third of the years through 2006 and these targets have not been met."); *id.* at 42 ("Mean monthly flows have...dropped below 810 cfs [the minimum flow for drought years] for at least one of the summer-time months during 7 of the last 17 years (1991-2007).").

<sup>189</sup> *Id.* at 48.

<sup>190</sup> See Sufficient Progress Assessment at 34 (noting average monthly flows significantly below 810 cfs in 15-mile reach in 2012 and 2013); *id.* at 31 (recognizing need to reduce the amount of time flows drop below 810 cfs in the 15-Mile Reach).

<sup>191</sup> Compare Colorado PBO at 40-41 (recommended mean monthly stream flows for 15-Mile Reach) with Exhibit F & Email from Tom Chart, FWS, Director, Upper Colorado River Endangered Fish Recovery Program to Wendy Park (July 15, 2016) (Exhibit H) (chart indicating dry, average, and wet precipitation years).

<sup>192</sup> See CBD Literature Review at 3 (noting ability to buffer Colorado River system will become more difficult as streamflows decrease).

<sup>193</sup> See Exhibit I (spreadsheet showing 15-Mile Reach flows and months with shortfall).

The Recovery Program's continuing pattern of failing to meet recommended flows is new information revealing that the Fluid Mineral Program may have effects on the endangered fish to an extent that was not considered in the PBO, and requires reinitiation of consultation over the Fluid Mineral Program.<sup>194</sup> Further, this failure constitutes a modification of the Fluid Mineral Program "that causes an effect to the listed species or critical habitat that was not considered in the biological opinion." Accordingly, BLM and the Service must reinitiate consultation.<sup>195</sup>

#### ***4. New Information Regarding Mercury and Selenium Effects on the Endangered Fish Requires Reinitiation of Consultation***

The PBO also fails entirely to address subsequent new information regarding mercury concentrations in the Upper Colorado Basin, mercury concentrations in Colorado pikeminnow and razorback sucker tissue, mercury toxicity (including reproductive and endocrine impairment) to endangered fish, and the population effects of mercury emissions. The PBO's discussion of the environmental baseline for, and threats to, the Colorado pikeminnow and razorback sucker contains no discussion whatsoever of environmental and tissue mercury contamination or the resulting toxicity and reproductive impairment to the endangered fish. The PBO acknowledges, without detail or quantitative analysis, that "[h]igh selenium levels may adversely affect reproduction and recruitment,"<sup>196</sup> but offers no discussion or analysis of the effects of mercury contamination. As discussed above, those effects are now extensively documented.

Once mercury is deposited on land or water, it is converted into a biologically available form, methylmercury (MeHg) by bacteria. Methylmercury "bioaccumulates in food chains, and particularly in aquatic food chains, meaning that organisms exposed to MeHg in their food can build up concentrations that are many times higher than ambient concentrations in the environment."<sup>197</sup> Once it accumulates, mercury is a potent neurotoxin, affecting fish in many ways, including brain lesions, reduced gonadal secretions, reproductive timing failures, reduced ability to feed, suppressed reproductive hormones, reduced egg production, reduced reproductive success, and transfer of mercury into developing eggs.<sup>198</sup> The published scientific literature concludes that survival, growth, reproduction, and behavior are impaired at a mercury concentration of 0.2 mg/kg wet weight in whole fish.<sup>199</sup>

Selenium is a dietary necessity at very low concentration for fish and other organisms, but toxic in higher levels. Threshold levels "encompass a range of dietary selenium of 2 to 10 mg/kg DW, with adverse effects a certainty as the upper limit is exceeded."<sup>200</sup> Selenium is a teratogen,

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<sup>194</sup> 50 C.F.R. § 402.16(b).

<sup>195</sup> *Id.* § 402.16

<sup>196</sup> PBO at 12.

<sup>197</sup> Four Corners Biological Opinion at 73.

<sup>198</sup> See Lusk, Joel D., USFWS, Mercury (Hg) and Selenium (Se) in Colorado Pikeminnow and in Razorback Sucker from the San Juan River, 17 (2010), available at [https://www.fws.gov/southwest/sjrip/pdf/DOC\\_Evaluation\\_Hg\\_Se\\_SJR\\_pikeminnow%20or\\_razorback\\_SJrip\\_BC\\_2010.pdf](https://www.fws.gov/southwest/sjrip/pdf/DOC_Evaluation_Hg_Se_SJR_pikeminnow%20or_razorback_SJrip_BC_2010.pdf).

<sup>199</sup> Beckvar, N., T.M. Dillon, and L.B. Reads, Approaches for linking whole-body fish tissue residues of mercury or DDT to biological effects threshold. *Environmental Toxicology and Chemistry* 24:2094-2105 (2005).

<sup>200</sup> Four Corners Biological Opinion at 100-101.

causing defects not in adult fish but larvae: “Feeding excessive Se to larvae, fry, or adults does not directly cause malformations in the recipient, but survival of larvae fed elevated Se can be severely compromised. Dietary Se toxicity to larval survival can occur at the same time that adult fish appear healthy.”<sup>201</sup> Although the precise effects vary with relative concentrations, mercury and selenium may have synergistic toxic effects at certain ratios.<sup>202</sup>

Analysis of tissue samples from Colorado pikeminnow in the Upper Colorado and White Rivers shows average muscle concentrations of mercury in excess of the thresholds for reproductive impairment. 2008-2009 muscle tissue averages were 0.60 mg/Kg Hg for Colorado pikeminnow in the Upper Colorado basin and 0.95 mg/Kg Hg for Colorado pikeminnow in the White River.<sup>203</sup> The 2008-09 fish muscle tissue data also shows the highest levels of selenium (1.9 mg/Kg) in Upper Colorado pikeminnow.<sup>204</sup>

The Service has acknowledged that its recovery planning for the Colorado pikeminnow needs updating to reflect this new information regarding mercury:

In addition, the recovery goal revision needs to consider the impacts of mercury. Beckvar et al. (2005) associated studies involving survival, growth, reproduction, and behavior and recommended that 0.2 mg/kg in whole fish be viewed as protective, while adverse biological effects are more likely at higher concentrations. Based on this threshold, the majority (64 %) of Colorado pikeminnow may be experiencing some reproductive impairment through mercury exposure. Management strategies for controlling anthropogenic mercury emissions are necessary as atmospheric pollution can indirectly affect this endangered species, its critical habitat, and its recovery by ambient air exposure, deposition into aquatic habitat and bioaccumulation in diet and in fish tissues.<sup>205</sup>

The significant difference in mercury concentrations in fish found in the neighboring Yampa and White Rivers also offers significant new information potentially relevant to the effect of BLM-authorized oil and gas development. Osmundson and Lusk found very high (average 0.95 mg/Kg WW) mercury concentrations in Colorado pikeminnow and in the White River, and lower (0.49 mg/Kg) concentrations in the neighboring Yampa.<sup>206</sup> Based on this discrepancy, they noted:

The Yampa and White rivers are relatively close geographically in northwestern Colorado. Because of this proximity, it is interesting that the Yampa River had the lowest mercury concentrations in Colorado pikeminnow while the White River had the highest mercury concentrations. If most of the mercury was from aerial wet and dry deposition, the two drainages should be similar. This difference may indicate a localized source/s of mercury contamination into the White River drainage. There are currently >2,600 gas and oil wells in Rio Blanco county. It is

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<sup>201</sup> *Id.* at 101 (citations omitted).

<sup>202</sup> *Id.* at 103.

<sup>203</sup> *Id.* at 76 & Table 3.

<sup>204</sup> *Id.*

<sup>205</sup> Colorado Pikeminnow 5-year Review at 21; *see also* Significant Progress Assessment at 10-11.

<sup>206</sup> Osmundson & Lusk 2011 at 21 & Table 2.

possible that there is some localized sources of mercury contamination into the White River drainage connected with oil and gas exploration and development.<sup>207</sup>

Although site-specific information for the Grand Junction and White River planning areas appears scarce, there is scientific as well as circumstantial evidence that oil and gas operations can contribute to mercury contamination.<sup>208</sup> The Fluid Mineral PBO does not consider the effect of oil and gas development within the White River watershed on the threat to Colorado pikeminnow and razorback sucker from mercury and selenium toxicity. Further, the Fluid Mineral PBO does not consider the potential for increased development of the Mancos shale play to increase selenium pollution of surface waters. Underground fractures induced by hydraulic fracturing may create a pathway for selenium-laced produced waters to reach surface waters. Moreover, surface spills of produced waters from the Mancos Formation would put endangered fish at risk.

Nor does the PBO give any consideration to the multiple ways in which climate change will exacerbate mercury and selenium contamination and toxicity. Climate change can foreseeably be predicted to increase heavy rainfall events and ensuing runoff, increase pollutant concentrations due to reduced flows during low-flow periods, and contribute to increased methylmercury conversion due to higher temperatures.

New scientific information regarding (a) mercury and selenium effects on fish reproduction and population viability, (b) mercury and selenium concentrations in Upper Colorado and White River fish, (c) the potential role of oil and gas development in mercury contamination levels in the White River, (d) the potential for development of the Mancos shale play to increase selenium pollution, and (e) the relationship between climate change and mercury and selenium toxicity constitutes new information revealing that the Fluid Mineral Program may have effects on the endangered fish to an extent that was not considered in the PBO, and requires reinitiation of consultation over the Fluid Mineral Program.<sup>209</sup>

## **B. BLM and the Service Failed to Reinitiate ESA Section 7 Consultation on the Fluid Minerals Program Despite The Lack of a Positive Population Response for the Colorado Pikeminnow and Humpback Chub**

### ***1. Colorado Pikeminnow Has Not Achieved 2015 Population Target for Colorado Sub-Basin or Realized a Positive Population Response***

The Recovery Program's failure to meet the Colorado pikeminnow recovery target for the Colorado River sub-basin population by 2015, or otherwise achieve a positive response for the

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<sup>207</sup> *Id.* at 29 (citations omitted).

<sup>208</sup> See U.S. EPA, National Risk Management Research Laboratory, Mercury in Petroleum and Natural Gas: Estimation of Emissions from Production, Processing, and Combustion, EPA/600/SR-01/066 (Oct. 2001); Visvanathan, C., Treatment and Disposal of Mercury Contaminated Waste from Oil and Gas Exploration Facilities, available at <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.549.9515&rep=rep1&type=pdf>.

<sup>209</sup> 50 C.F.R. § 402.16(b).

Colorado River and Green River sub-basin populations, triggers reinitiation under the express terms of the Fluid Mineral PBO.

The Fluid Mineral PBO incorporates the reinitiation terms of the Colorado River PBO adopted in 1999, which encompasses projects that deplete water from the Colorado River above the confluence with the Gunnison River.<sup>210</sup> For “[p]rojects that fall under the umbrella of the Colorado River PBO,” reinitiation is required if new information shows “the lack of a positive population response by the year 2015 or when new depletions reach 50,000 acre-feet/year.”<sup>211</sup> Under the Colorado River PBO, a positive response “would require the adult Colorado pikeminnow population estimate to be 1,100 individuals (+/-250) in the Colorado River (Rifle Colorado to the confluence with the Green River).”<sup>212</sup>

In addition, the Fluid Mineral PBO requires reinitiation if a “positive population response for any of [the endangered fish] is not realized, as measured by the criteria outlined in the RIPRAP.”<sup>213</sup> The referenced criteria are the 2002 Recovery Goals’ downlisting criteria, which, among other things, require that the pikeminnow’s Colorado River sub-basin population achieve “a self-sustaining population of 700 adults over a 5-year period, with a trend in adult point estimates that does not decline significantly.”<sup>214</sup> The Recovery Goals project downlisting could be proposed in 2007 and delisting proposed in 2013.<sup>215</sup>

The most recent Sufficient Progress Assessment indicates that the 1,100 population target has not been met by 2015, and that a positive population response with respect to the 2002 Recovery Goals has not been realized almost a decade after the projected attainment date of 2007:

The average of all adult estimates (1992-2014; estimates from 2013 and 2014 are considered preliminary) is 613. ***The average of the five most recent annual adult population estimates is 501.*** Osmundson and White (2014) determined that recruitment rates were less than annual adult mortality in six years and exceeded adult mortality in the other six years when sampling occurred. The estimated net gain for the 12 years studied is 23 fish h 450 mmTL. Although the Colorado River population appears to meet the trend of ‘self-sustainability’ criterion, ***it has not met the abundance criteria of ‘at least 700 adults’ during the most recent five year period.*** The Service is reevaluating the demographic and threat removal criteria for Colorado pikeminnow through revision of the species’ recovery plan.<sup>216</sup>

2015 catch numbers are within the same range, which suggests that the population estimate for 2015 will be similar to the 2014 estimate.<sup>217</sup> The latest population number of 501 adults falls far

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<sup>210</sup> See PBO at 3.

<sup>211</sup> PBO at 52.

<sup>212</sup> *Id.*

<sup>213</sup> *Id.*

<sup>214</sup> *Id.* at 48.

<sup>215</sup> Pikeminnow Recovery Goals at 51.

<sup>216</sup> Sufficient Progress Assessment at 4.

<sup>217</sup> See USFWS, Monitoring the Colorado Pikeminnow Population in the Mainstem Colorado River via Periodic Population Estimates at 3 (Nov. 2015), available at <http://www.coloradoriverrecovery.org/documents->

short of both the 1,100 target by the 2015 deadline and the 700 recovery goal. According to the Service, the recent population declines “are cause for great concern”—catch of sub-adults and adults in 2013 and 2014 “were near lowest observed in the history of the project.”<sup>218</sup>

The Green River sub-population of pikeminnow is similarly experiencing ongoing decline. The Recovery Goals require that “separate adult point estimates for the middle Green River and lower Green River do not decline significantly over a 5-year period, and each estimate for the Green River Subbasin exceeds 2,600 adults (estimated minimum viable population [MVP] number).”<sup>219</sup> The most recent data show the population is “in decline throughout the entire Green River Subbasin”—falling under 2,000, below the minimum viable population of 2,600 adults—and has not achieved adult recruitment in excess of annual adult mortality in two out of three population evaluation periods.<sup>220</sup> The Yampa River portion of the sub-basin population also “remains low and may be in further decline.”<sup>221</sup>

Persistently low Colorado pikeminnow numbers and declines in both sub-basins indicate a failure to realize a positive population response.<sup>222</sup> Reinitiation of consultation over the Fluid Mineral Program is therefore required by the express terms of the PBO.<sup>223</sup>

## ***2. Humpback Chub Has Not Realized a Positive Population Response***

The Upper Basin’s humpback chub populations have also failed to exhibit a positive population response, requiring reinitiation of consultation pursuant to the express terms of the PBO.

Again, the Fluid Mineral PBO requires reinitiation if a “positive population response for any of [the endangered fish] is not realized, as measured by the criteria outlined in the RIPRAP.”<sup>224</sup> With respect to the humpback chub, the referenced criteria are the 2002 Recovery Goals’ downlisting criteria for the species. The criteria include: “each of five populations in the upper Colorado River basin is self-sustaining over a 5-year period, with a trend in adult point estimates that does not decline significantly,” and “one of the five populations (e.g., Black Rocks/Westwater Canyon or Desolation/Gray Canyons) must be maintained as a core population such that each estimate exceeds 2,100 adults (estimated minimum viable population [MVP] number).”<sup>225</sup> The 2002 Recovery Goals estimate the criteria will be attained by 2007 and delisting proposed by 2010.<sup>226</sup>

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[publications/work-plan-documents/arpts/2015/rsch/127.pdf](#) (showing similar capture rates of pikeminnow in 2014 and 2015).

<sup>218</sup> Sufficient Progress Assessment at 23, 36.

<sup>219</sup> *Id.* at 6.

<sup>220</sup> *Id.* at 7.

<sup>221</sup> *Id.*

<sup>222</sup> *See id.* at 30 (Service “remain[s] concerned over low densities of Colorado pikeminnow in the Green and Colorado River subbasins”); *id.* at 23 (2011-2014 preliminary results of population estimates “indicate adults and sub-adults are in decline throughout the entire Upper Colorado River basin, especially in the Yampa and Colorado rivers.”).

<sup>223</sup> 50 C.F.R. § 402.16.

<sup>224</sup> PBO at 52.

<sup>225</sup> Humpback Chub Recovery Goals at 42-43. A core population is “an independent self-sustaining population sufficiently large to maintain genetic and demographic viability.”*Id.* at 13.

<sup>226</sup> *Id.* at 51.



Recovery efforts have failed to achieve any positive response almost a decade after the Recovery Goals' projected downlisting date of 2007. In particular, the Service "remains concerned that wild populations of humpback chub in Black Rocks and Westwater Canyon of the Colorado River (near the Colorado-Utah state line) have not recovered from declines detected in the late 1990's. The reason for those population declines is uncertain."<sup>227</sup> After this steep reduction, the Black Rocks/Westwater population continued to decline.<sup>228</sup> In 2008, the population "dropped below the population size downlist criterion (MVP = 2,100 adults) for the first time."<sup>229</sup> In 2011 and 2012, the core population estimates were 1,846 and 1,718, respectively.<sup>230</sup> Studies indicate that lapses in adult recruitment is a problem,<sup>231</sup> and improved understanding of the species' preferred habitat is needed.<sup>232</sup>

The other potential core population—Desolation/Gray Canyons—has also not met the population-size downlist criterion, and was observed to be "trending downward" based on 2006-2007 population estimates.<sup>233</sup> This trend has been attributed to "increased nonnative fish abundance and habitat changes associated with dry weather and low river flows."<sup>234</sup> The 2014 estimate is 1,863 adults, substantially below the 2,100-adults recovery criterion.<sup>235</sup> Further, the proportion of captured individuals in 2015 that were first-year adults was 7.9%, continuing "a significantly declining trend in this metric since the 2001–2003 sampling period."<sup>236</sup> This "significant decline" in the percentage of captured individuals that were first-year adults "may be an indication that the future stability of the population is uncertain."<sup>237</sup>

Finally, the two smaller Yampa Canyon and Cataract Canyon populations do not indicate "self-sustaining" populations. "[I]t is not known if pure humpback chubs occur in Yampa Canyon."<sup>238</sup> The Cataract Canyon population is "small," decreasing by over half, from 150 wild adults in 2003 to 66 in 2005 such that population estimates are no longer possible.<sup>239</sup>

The lack of a positive population response by the humpback chub compels reinitiation of consultation over the Fluid Mineral Program.<sup>240</sup>

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<sup>227</sup> Sufficient Progress Assessment at 36.

<sup>228</sup> *Id.* at 13-14.

<sup>229</sup> *Id.* at 13.

<sup>230</sup> *Id.* at 14.

<sup>231</sup> *Id.* at 14, 24.

<sup>232</sup> *Id.* at 36 (recommending investigation of "factors limiting a positive response").

<sup>233</sup> *Id.* at 12.

<sup>234</sup> *Id.* at 23.

<sup>235</sup> *Id.* at 12-13.

<sup>236</sup> USFWS, Colorado River Recovery Program, FY 2015 Annual Project Report, Project No. 129, Humpback chub population estimates for Desolation/Gray Canyons, Green River Utah, p. 4 (Nov. 13, 2015), available at <http://www.coloradoriverrecovery.org/documents-publications/work-plan-documents/arpts/2015/rsch/129.pdf>.

<sup>237</sup> *Id.*

<sup>238</sup> Sufficient Progress Assessment at 11.

<sup>239</sup> *Id.* at 14.

<sup>240</sup> 50 C.F.R. § 402.16.

**C. BLM and the Service Failed to Reinitiate ESA Section 7 Consultation on the Fluid Minerals Program Despite BLM’s Violation of the Incidental Take Statement**

Under 50 C.F.R. § 402.16(a), reinitiation is required if the amount of incidental take specified in the incidental take statement is exceeded.<sup>241</sup> Pursuant to the PBO, water depletions under the Fluid Mineral Program are a surrogate for take. Here, BLM has violated the incidental take permit’s limit on water depletions for the Colorado River sub-basin.

As discussed above on p. 19, in FY2015 depletions were almost double the depletion projection for the Colorado River sub-basin, in violation of the depletion limit for this sub-basin, as a result of a number of horizontal wells drilled by Black Hills in the Grand Junction Field Office. BLM and the Service have not performed any separate Section 7 consultation on these excessive depletions, and neither BLM nor Black Hills obtained an incidental take permit for these excessive depletions.<sup>242</sup>

BLM and the Service’s failure to reinitiate consultation over the Fluid Mineral Program in light of this exceedance violates 50 C.F.R. § 402.16(a).

**D. BLM and the Service Failed to Reinitiate ESA Section 7 Consultation on the Fluid Minerals Program Despite BLM’s Failure to Follow the Terms of the PBO Requiring Monitoring of Actual Water Depletions**

BLM’s failure to monitor actual water depletions also triggers reinitiation. The Fluid Mineral PBO’s validity depends on compliance with the depletion threshold for each sub-basin and the overall depletion threshold for the entire Upper Basin. The incidental take statement for the PBO prohibits take above these depletion thresholds, and reinitiation is required if a depletion threshold is exceeded.<sup>243</sup> The only way the Service could determine compliance with the depletion threshold is through monitoring of actual depletions. Accordingly, the PBO requires that “logs showing depletion amounts from wells drilled will be used to track compliance with the threshold depletion amount.”<sup>244</sup> Monitoring data from horizontal wells confirms that water depletion amounts may be highly variable and are unpredictable, and that depletions from oil and gas activities can result in incidental take.<sup>245</sup> Further, no measures require operators to use produced or recycled water for fracking operations as the PBO assumes will occur in most field offices. Actual monitoring is therefore critical to protecting the endangered fish.

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<sup>241</sup> PBO at 51-52.

<sup>242</sup> Letter from Service to Center (July 14, 2016) (“All horizontal wells drilled in the BLM Grand Junction Field Office area in FY2014-FY2016...fit under the umbrella of the PBO and were included within the framework of the PBO. No additional or separate Section 7 consultation was needed or conducted for these wells.”) (Exhibit J).

<sup>243</sup> PBO at 50.

<sup>244</sup> PBO at 5.

<sup>245</sup> See p. 19 above.

BLM's failure to comply with its monitoring duty requires the agencies to re-consult over the effects of the Fluid Mineral Program on the endangered fish.<sup>246</sup>

### **E. The Service Violated the ESA in Preparing the April 27, 2015 Biological Opinion and March 11, 2015 Letter of Concurrence**

The Service's April 27, 2015 Biological Opinion – Revision of the RMP for the Grand Junction Field Office; and the Service's March 11, 2015 Letter of Concurrence – Oil and Gas Amendment to the White River Field Office RMP both violate ESA Section 7 and are arbitrary and capricious under the APA, for the following reasons.<sup>247</sup>

#### ***1. The Service Failed to Consider Relevant Factors***

In preparing the 2015 Biological Opinion and 2015 Letter of Concurrence, the Service failed to consider a number of relevant factors concerning the impacts of oil and gas exploration and development in the Upper Colorado River Basin on the four endangered fish and their critical habitat. These factors include:

- new drilling technologies, including horizontal drilling, and the vast development potential of the Mancos shale play in western Colorado, enabled by horizontal drilling;
- climate change effects on stream flows and the endangered fish and their critical habitat;
- the Recovery Program's failure to maintain recommended baseline flows, including flows within the 15-Mile Reach;
- recent Colorado pikeminnow and humpback chub population declines;
- the Recovery Program's failure to make progress in recovering the endangered fish; and
- mercury and selenium pollution effects on the endangered fish.

The Service's failure to consider these factors violates the ESA, 16 U.S.C. § 1536, 50 C.F.R. § 402.12, 50 C.F.R. § 402.14, and the APA, 5 U.S.C. § 706.

#### ***2. The Service Improperly Relied on the Fluid Mineral PBO***

Because BLM and the Service have failed to reinitiate consultation on the Fluid Mineral Program, and BLM and the Service's consultations for the Grand Junction RMP revision and White River RMP amendment relied on the PBO, the Service's Biological Opinion and Letter of Concurrence for the Grand Junction and White River RMPs, respectively, are unlawful and must be set aside. Specifically:

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<sup>246</sup> 50 C.F.R. §§ 402.16(b) and (c).

<sup>247</sup> 16 U.S.C. § 1536; 5 U.S.C. § 706; *see also* 50 C.F.R. §§ 402.12, 402.14.

- Because new information or circumstances triggered reinitiation of consultation on the Fluid Mineral Program before approval of the RMPs (e.g., information regarding the greater water depletion effects of horizontal drilling and BLM’s failure to monitor depletions discussed in Section I(A) and (D)), BLM and the Service improperly relied on the PBO for their consultations over the RMPs. This reliance on the PBO violated Section 7 of the ESA and was arbitrary and capricious, in violation of APA § 706(2)(A).
- Because new information or circumstances trigger reinitiation of consultation on the Fluid Mineral Program, as detailed in Sections I(A)-(D) above, and the White River and Grand Junction RMP consultations relied on the PBO, the agencies are also required to reinitiate consultation over the RMPs, in compliance with 50 C.F.R. § 402.16.

In short, because the Fluid Mineral PBO is invalid, so are the Service’s Biological Opinion and Letter of Concurrence regarding the Grand Junction and White River RMPs, and they must be set aside.<sup>248</sup>

### ***3. The Service Failed to Adequately Consider the Effects of Spills and Leaks on Endangered Fish***

For both the White River and Grand Junction RMPs, the Service failed to adequately consider the effects of spills and leaks from oil and gas operations on the endangered fish, in violation of ESA Section 7 and the APA.<sup>249</sup>

#### **a) The Service and BLM Failed to Consult Over the Grand Junction RMP’s Spills Effects, in Violation of 16 U.S.C. § 1536(a)(2), but to the Extent They Did So, the Service’s Biological Opinion Is Arbitrary and Capricious**

It is extremely unclear whether BLM and the Service consulted over the Grand Junction RMP’s spill effects from oil and gas development. In the BA, BLM did not explicitly determine that spill and leaks within the Grand Junction Field Office are not likely to adversely affect the endangered fish, but suggested that consultation over spills and leaks is not required and may be deferred until a hazardous spill actually occurs:

While such programs as travel, ROWs, and wildland fire suppression have the potential for accidental spills and leaks of hazardous substances associated with their application on BLM lands, the BLM does not authorize these accidents. The RMP and this BA contain conservation measures to reduce the risk of these occurrences near critical habitats for these fish. In the rare and unlikely event of a spill, the BLM would initiate emergency consultation with the USFWS.<sup>250</sup>

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<sup>248</sup> 16 U.S.C. § 1536, 50 C.F.R. § 402.16, 5 U.S.C. § 706.

<sup>249</sup> 5 U.S.C. § 706.

<sup>250</sup> GJFO BA at 5-4.

The Service's Biological Opinion makes no explicit finding as to this statement. The Service's failure to make any determination as to spill effects violates Section 7, 16 U.S.C. § 1536(a)(2) and 50 C.F.R. § 402.14.<sup>251</sup>

To the extent that the Service implicitly concurred in BLM's above statement regarding the Grand Junction RMP's spill effects, that concurrence lacks adequate legal and factual support and is arbitrary and capricious. The finding ignores the best available information concerning the potential frequency of spills; erroneously suggests that consultation over accidental spills and leaks is not required; and is unsupported by adequate mitigation.

First, spills regularly occur in the Grand Junction Field Office. For example, 1,125 spills occurred between January 2000 and May 2015 within Garfield and Mesa Counties, according to the Colorado Oil and Gas Conservation Commission's online database.<sup>252</sup> Between January 2008 and July 2014, 15 spills resulted in contamination of groundwater or surface water within the Grand Junction planning area.<sup>253</sup>

Nor did the Service consider the potential for increased oil and gas development, horizontal drilling, and hydraulic fracturing under the Grand Junction RMP to lead to a higher rate of spills contaminating surface or groundwater—from an historical average of two spills per year to potentially over 17 spills per year.<sup>254</sup> BLM also failed to acknowledge the potential for greater risk of contamination due to: (1) underreporting of spills and leaks, (2) the potential for spills confined to soil to contaminate groundwater and surface water via erosion or runoff, (3) the lengthy lag time between spills or leaks and their detection, (4) the greater volumes of chemicals and wastewater stored and transported as a result of fracking operations, and (5) the potential for smaller leaks to go undetected and cause chronic, sub-lethal effects.<sup>255</sup>

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<sup>251</sup> Likewise, to the extent that BLM did not initiate consultation with respect to spills, the failure to do so violates Section 7, 16 U.S.C. § 1536(a) and 50 C.F.R. § 402.14, and BLM's rationale is arbitrary and capricious as further explained below.

<sup>252</sup> See <http://cogcc.state.co.us/data.html#/cogis>.

<sup>253</sup> See Center for Biological Diversity, Upper Colorado River Basin Spills (hereinafter "Spills Data") (Exhibit K) (submitted with and cited in CBD Grand Junction RMP Protest at 11. This Excel spreadsheet consists of data reporting spills in the Upper Colorado River Basin that we compiled from the following sources: Colorado: Colorado Oil and Gas Conservation Commission, <http://cogcc.state.co.us> ("inspection/incident" database for "spill/release"); Utah: Utah Department of Environmental Quality, [http://eqspillsp.deq.utah.gov/Search\\_Public.aspx](http://eqspillsp.deq.utah.gov/Search_Public.aspx); New Mexico: State of New Mexico Oil Conservation Division, <https://www.wapps.emnrd.state.nm.us/ocd/ocdpermitting/Data/Incidents/Spills.aspx>. The analysis does not include data from Wyoming or Arizona.

<sup>254</sup> According to the Grand Junction RMP-FEIS, the number of completed wells in the Grand Junction planning area (including producing and shut-in wells) is 521 wells. GJFO RMP-FEIS 3-172. With the number of producing wells expected to increase 2.5 times that amount (521 existing wells + 780 new producing wells = 1301), the risk of spills contaminating surface waters or groundwater could likewise increase proportionally to over 5 spills per year in the Grand Junction planning area. This risk could be even higher since the Grand Junction RMP contains no limits on the rate or number of wells drilled, and the RFD projects a maximum rate of development of 197 wells per year (or 3940 new wells over 20 years). See *id.* at 4-441. Assuming this higher development rate, the number of spills could proportionately increase to over 17 spills per year.

<sup>255</sup> USFWS, Biological Opinion for the Gasco Energy Inc. Field Development Project, 26 (2011) ("Gasco

Second, the suggestion that formal consultation as to spill effects is not required because BLM “does not authorize these accidents,” is mistaken. An action agency must consider “the effects of the action as a whole,”<sup>256</sup> including indirect effects “that are caused by the proposed action and are later in time, but still are reasonably certain to occur.”<sup>257</sup> As demonstrated above, accidental spills and leaks are “reasonably certain to occur,” and thus must be evaluated in a formal consultation.

Moreover, “the emergency consultation provision of 50 C.F.R. § 402.05 is not a substitute for required consultation under [Section 7(a)-(c)].”<sup>258</sup> As one court has explained, this “exception” for “emergency situations that formal consultation be initiated as soon as practicable after the emergency is under control” is “meant for *unexpected* exigencies.”<sup>259</sup> As detailed above, spills resulting from oil and gas development are “not unexpected but guaranteed” to occur, and “the only question is when and where.”<sup>260</sup> Accordingly, “[t]here is no reason why [BLM] cannot conduct formal consultation with FWS and no reason to find that the ESA requires anything less.”<sup>261</sup>

Third, the sufficiency of conservation measures to prevent spills and leaks lacks adequate analytical support. “Mitigation measures must be reasonably specific, certain to occur, and capable of implementation; they must be subject to deadlines or otherwise-enforceable obligations; and most important, they must address the threats to the species in a way that satisfies the jeopardy and adverse modification standards.”<sup>262</sup>

Measures in the RMP do not effectively address common causes of spills, including pinhole leaks, corrosion, and equipment failure.<sup>263</sup> And there are no certain requirements for addressing pipeline spills, such as automatic shutoff valves and double-walled pipelines.<sup>264</sup> In addition, according to the Grand Junction RMP-FEIS, Colorado Oil and Gas Conservation Commission (COGCC) studies showed that “surface and groundwater contamination, due to oil and gas

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BO”), available at [http://www.blm.gov/style/medialib/blm/ut/vernal\\_fo/planning/gasco\\_eis/gasco\\_rod.Par.56176.File.dat/Gasco%20ROD%20Attachment%205%20BO.pdf](http://www.blm.gov/style/medialib/blm/ut/vernal_fo/planning/gasco_eis/gasco_rod.Par.56176.File.dat/Gasco%20ROD%20Attachment%205%20BO.pdf).

<sup>256</sup> 50 C.F.R. § 402.14(c).

<sup>257</sup> *Id.* § 402.02.

<sup>258</sup> *Forest Serv. Emples. for Env'tl. Ethics v. United States Forest Serv.*, 397 F. Supp. 2d 1241, 1256 (D. Mont. 2005).

<sup>259</sup> *Id.* at 1256-57 (emphasis added); see also USFWS, ESA Consultation Handbook, 8-1 (1998) (“Predictable events...usually do not qualify as emergencies under the Section 7 regulations unless there is a significant unexpected human health risk.”).

<sup>260</sup> See *Forest Service Employees*, 397 F. Supp. at 1257.

<sup>261</sup> *Id.*

<sup>262</sup> See *Ctr. for Biological Diversity v. Rumsfeld*, 198 F. Supp. 2d 1139, 1152 (D. Ariz. 2002).

<sup>263</sup> For further elaboration, see CBD Grand Junction RMP Protest at 13, 16-18, 23-24 (Exhibit D).

<sup>264</sup> GJFO RMP-FEIS at H-93, H-16 (safeguards “such as double-walled pipe and remotely-actuated block or check valves on both sides of the stream may be used” at stream crossings where listed species may be affected).

development... occurred between 1,000 to 1,800 feet from the drilling,”<sup>265</sup> but all of the RMP’s buffer zones are well short of 1,800 feet.<sup>266</sup>

Spills are therefore not only likely, they would have potentially devastating impacts on the endangered fish. The Service’s failure to address these impacts violates Section 7(a)(2), or to the extent they are addressed, its findings are arbitrary and capricious.<sup>267</sup>

**b) The Service’s Concurrence in BLM’s Findings as to the White River RMP’s Spill Effects is Arbitrary and Capricious**

The BA for the White River RMP acknowledges the potential for increased development resulting in a higher level of leaks and spills and harm to the endangered fish.<sup>268</sup> Nonetheless, the Service determined that the RMP is not likely to adversely affect the endangered fish.<sup>269</sup> This finding is unsupported and arbitrary and capricious, because mitigation measures for spills are not “certain to occur,” or otherwise do not “address the threats to the species in a way that satisfies the jeopardy and adverse modification standards.”<sup>270</sup>

The RMP’s measures to mitigate the threat of accidental pipeline spills and leaks in endangered fish critical habitat are subject to broad and standardless exceptions, rendering them toothless. Generally, pipelines crossing critical habitat are prohibited, but exceptions are allowed. According to the BA, “the absence of automatic shutoff valves for natural gas pipelines that cross the White River’s critical habitat has been identified as a potential threat to endangered Colorado River fishes.”<sup>271</sup> To address this threat, the BA notes that automatic shutoff valves, double-walled pipelines, and avoidance of construction in sites important for pikeminnow reproduction are required when an exception is granted.<sup>272</sup>

The RMP, however, does not actually require these measures. It merely provides that they “*could be considered* for granting exceptions” to the general prohibition on pipeline crossings in critical habitat.<sup>273</sup> No standards for when these measures should be required are specified. The Service’s

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<sup>265</sup> GJFO RMP-FEIS at 6-271.

<sup>266</sup> See, e.g., *id.*, Appendix B, NSO CO (no surface occupancy and use and surface-disturbing activities within 400 meters [1,312 feet] of Colorado, Gunnison, and Dolores Rivers, or within 100 meters [328 feet] of their 100-year floodplains, whichever is greatest); NSO-2 (same within 100 meters of streams/springs possessing lotic riparian characteristics); NSO-4 (same within 100 meters of intermittent, and ephemeral streams; riparian areas, fens and/or wetlands; and water impoundments); NSO-13 (in undisturbed environments and ACECs, prohibit new disturbance within 200 meters of current and historically occupied and suitable habitat for listed, proposed, and candidate species); CSU-3

(“Surface-disturbing actions within a minimum distance of 30 meters [from definable streams] should be avoided to the greatest extent practicable.”).

<sup>267</sup> 16 U.S.C. § 1536(a)(2); 50 C.F.R. § 402.14, 5 U.S.C. § 706.

<sup>268</sup> See WRFO BA at 4-6.

<sup>269</sup> *Id.*

<sup>270</sup> *CBD*, 198 F. Supp. at 1152.

<sup>271</sup> WRFO BA at 4-6.

<sup>272</sup> *Id.*

<sup>273</sup> BLM, WRFO Approved RMPA, Appendix 1, WR-NSO 17.

determination that pipeline spills are not likely to adversely affect the endangered fish is unsupported.

The Service's concurrence also mentions the adoption of lease stipulations that would prohibit surface disturbance within certain distances of designated riparian areas, mapped 100-year floodplains, perennial waters, springs, water wells, wetlands, and other water resources.<sup>274</sup> But these buffer zones are subject to exceptions.<sup>275</sup> Without any certainty that these stipulations would apply to development sited near aquatic resources, reliance on these stipulations in support of a "not likely to adversely affect" finding is arbitrary, in violation of APA § 706(2)(A). To the extent that BLM and the Service intend to rely on a future consultation over the application of these exceptions, this approach violates the ESA's directive that the agency "review its actions at the earliest possible time to determine whether any action may affect listed species or critical habitat."<sup>276</sup>

Finally, BLM's regional hazard materials response plans and operators' contingency plans would have no effect on reducing the increased potential for spills and leaks, since they are existing requirements and purely reactive. These measures do not "address the threats to the species in a way that satisfies the jeopardy and adverse modification standards."

#### ***4. The Service Failed to Use the Best Available Data, In Violation of 16 U.S.C. § 1536(a)(2) and the APA***

In consulting over the White River and Grand Junction RMPs' effects on the endangered fish, the Service failed to "use the best scientific and commercial data available,"<sup>277</sup> failed to "examine the relevant data and articulate a satisfactory explanation for its action including a 'rational connection between the facts found and the choice made,'" and "entirely failed to consider an important aspect of the problem."<sup>278</sup> These errors infect the Service's analyses of direct, indirect, and cumulative effects on the endangered fish and final effects determinations.

For example, in evaluating the Grand Junction RMP's water depletion and spill effects, the Service failed to take into account:

- the increased number of wells forecast in the 2012 RFD for the Grand Junction planning area, including its horizontal well projections for both federal and non-federal wells;
- actual, historical data on the average water use for horizontal wells that BLM collected to specifically determine "how much water is depleted by an 'average' horizontal well";<sup>279</sup>

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<sup>274</sup> Service Concurrence at 4 (citing NSO 55-E, CSU-02, CSU-06).

<sup>275</sup> See WRFO Approved RMPA, Appendix 1, NSO-55 (exception applies if "values or functions for which the ACEC was established" would not be compromised); CSU-02 (exception for activity that "would not degrade the resource identified"); CSU-06 (exception if "proper functioning condition of the riparian/wetland area" would not be degraded).

<sup>276</sup> 50 C.F.R. § 402.14(a).

<sup>277</sup> 16 U.S.C. § 1536(a).

<sup>278</sup> See *Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983).

<sup>279</sup> See BLM Instruction Memorandum CO-2011-022.



- data and incident reports regarding spills and leaks that have occurred within the Grand Junction planning area and western Colorado;
- evidence of declining endangered fish populations; and
- information regarding the impacts of climate change on Colorado River stream flows, despite that the Grand Junction RMP-EIS confirmed that climate change would have “foreseeable” effects on water and fish resources.<sup>280</sup>

Moreover, in evaluating the White River RMP’s effects on the endangered fish, the Service ignored, among other things:

- information indicating the massive water depletion effects of horizontal drilling, including exploratory wells;
- the development potential of the Mancos shale play in the White River Field Office and throughout the rest of the Upper Basin, including federal and non-federal horizontal wells; and
- climate change effects on stream flows despite acknowledging these effects in the White River BA and RMP-FEIS.<sup>281</sup>

The Service’s failure to use and consider the best available data in its consultations over the RMPs violates ESA Section 7(a)(2), 16 U.S.C. § 1536(a)(2), and the APA, 5 U.S.C. § 706(2)(A).

#### **F. BLM’s Reliance on the Service’s April 27, 2015 Biological Opinion and March 11, 2015 Letter of Concurrence Violates the ESA**

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<sup>280</sup> GJFO RMP-FEIS at 4-113, 4-93, 4-219. BLM’s finding in the BA that “there are many unknowns about potential [climate change] impacts and their likelihood” is unsupported and inconsistent with the best available information. GJFO BA at 4-31. *See also* GJFO BO at 25 (noting a primary threat to DeBeque phacelia is “climate change and drought”); GJFO RMP-FEIS at 3-60 (noting climate change impacts on Colorado “may include earlier melting of snowpack, lower river flows in summer months, water shortages for irrigated agriculture, slower recharge of groundwater aquifers, effects on water availability for recreation and wildlife use...”); *id.* at 3-61 (“Climate change may result in modified hydrographs which could result in earlier than normal peak flow conditions. Likewise climate change could result in water depletions associated with longer growing seasons (increased transpiration.)”); *id.* at 4-86 (noting potential for frequent future droughts); *id.* at 4-219 (“Since special status species often inhabit very specific microhabitats, small changes [resulting from climate change] could cause large effects.”); *id.* at 4-114 (noting climate change could causes changes in temperatures and precipitations and water availability); *id.* at 4-180 (changes in water flows and temperatures “would alter habitat conditions, potentially creating conditions that could favor certain species or communities, weeds, or pests”).

<sup>281</sup> *See* WRFO BA at 3-39 (noting climate change threat to greenback cutthroat trout); WRFO RMP-FEIS at 4-629-31 (detailing projected impacts of climate change in White River planning area, including decline in snowfall, “[r]educed winter snowpack caus[ing] less water to flow into the Colorado River,” and “[m]ore frequent, more severe, and longer-lasting droughts”).

BLM has an independent, substantive duty under Section 7 of the ESA to ensure that its actions are not likely to jeopardize listed species or adversely modify their critical habitat.<sup>282</sup> Because the Service's April 27, 2015 Biological Opinion and March 11, 2015 Letter of Concurrence violate the ESA and are unlawful, BLM's reliance on the April 27, 2015 Biological Opinion and March 11, 2015 Letter of Concurrence to fulfill its Section 7 procedural and substantive obligations is also arbitrary, capricious, and in violation of the ESA.<sup>283</sup> Without a lawful and valid Biological Opinion for the Grand Junction RMP revision and the White River RMP amendment, BLM has failed to insure that implementation of these RMPs is not likely to jeopardize the continued existence of the four endangered fish, or result in the destruction or adverse modification of the species' critical habitat, as required by the ESA.<sup>284</sup>

### **G. BLM Has Failed to Insure Against No Jeopardy and Adverse Modification**

Despite the glaring need for a number of years to reinitiate consultation with the Service concerning BLM's Fluid Minerals Program within the Upper Colorado River Basin in western Colorado, complete consultation on the Grand Junction and White River RMPs' spill effects, and monitor actual water depletions of development allowed under BLM's Fluid Mineral Program, BLM has continued to proceed with RMP revisions and amendments, and the authorization and allowance of additional oil and gas exploration and development activities in the Upper Basin. By failing to comply with the Section 7 consultation requirements and its monitoring duty, BLM is in ongoing violation of its substantive duty to ensure that its authorization of oil and gas exploration and development in the Upper Colorado River Basin in Colorado is not likely to jeopardize the continued existence of the four endangered fish or result in the destruction or adverse modification of their critical habitat.<sup>285</sup>

### **H. BLM's Continued Authorization and Approval of Oil and Gas Projects and Development Within the Upper Colorado River Basin in Colorado That Are Reasonably Certain To Cause Take of the Endangered Fish Violates Section 9 of the ESA**

BLM's continued and imminent approval of numerous horizontal wells throughout the Upper Colorado River Basin in Colorado without adequate Section 7 consultation causes and threatens violation of ESA Section 9's take prohibition. BLM's approval and Black Hills' development of eight horizontal wells within the Grand Junction Field Office in FY2015 have already resulted in violation of the PBO's incidental take permit and of Section 9's take prohibition. Fourteen horizontal wells were developed within the Colorado River sub-basin in FY2015, eight of which were developed by Black Hills within the Grand Junction Field Office. Black Hills' horizontal wells consumed a total of 620.87 acre-feet of fresh water in FY2015, or an average of 77.61 acre-feet of fresh water per well, exceeding the Colorado River sub-basin's incidental take limit by 241.87 acre-feet.<sup>286</sup> In FY2014, BLM allowed Black Hills to drill two horizontal wells within

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<sup>282</sup> 16 U.S.C. § 1536(a)(2).

<sup>283</sup> *Id.*; *Center for Biological Diversity v. Salazar*, 804 F. Supp. 2d 987, 1010 (D. Az. 2011) (an action agency's reliance on a legally flawed biological opinion is arbitrary and capricious).

<sup>284</sup> 16 U.S.C. § 1536(a)(2); *Center for Biological Diversity*, 804 F. Supp. 2d at 1010.

<sup>285</sup> 16 U.S.C. § 1536(a)(2).

<sup>286</sup> *See* Water Depletion Logs.

the Grand Junction Field Office, which consumed 70.8 and 63.1 acre-feet of fresh water, over 2.5 times the total amount projected for the entire Grand Junction planning area.<sup>287</sup>

This recent uptick in horizontal drilling is part of Black Hills' plans to "accelerate[]" its Mancos drilling program: production results from three Mancos wells drilled in late 2014 "exceeded [Black Hills'] expectations," and in mid-2015 it had "three drilling rigs operating and ten additional Mancos Shale horizontal wells in progress."<sup>288</sup> New Black Hills wells are being permitted pursuant to the Black Hills DeBeque Exploratory Proposal, which BLM approved in 2012.<sup>289</sup> For example, in October and December 2015, BLM permitted eight new horizontal wells pursuant to the Exploratory Proposal, which all appear to fall within the Colorado River sub-basin.<sup>290</sup>

Three of these wells have also been approved by the COGCC, but have not been drilled or completed, according to COGCC records.<sup>291</sup> Given that the COGCC permits expire in December 2017, drilling and completion of these wells is imminent.<sup>292</sup> The other five wells approved by BLM do not yet have COGCC records<sup>293</sup> and therefore do not appear to have been drilled. If past depletions are any indication, these eight new horizontal wells could result in depletions in excess of the PBO's limit for the Colorado River sub-basin in FY2016. BLM and the Service, however, appear to believe that no further consultation is necessary for these horizontal wells, because they are already covered by the PBO.<sup>294</sup>

Further, currently BLM is considering approval of the DeBeque Southwest and Homer Deep Master Development Plans by Black Hills to develop 140 horizontal wells to target the Mancos

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<sup>287</sup> *Id.*

<sup>288</sup> PR Newswire, Black Hills Corp. Reports First Quarter 2015 Results (May 4, 2015), available at <http://www.pnewswire.com/news-releases/black-hills-corp-reports-first-quarter-2015-results-300077002.html>.

<sup>289</sup> BLM, BLM seeks comments on natural gas development proposal near DeBeque (Jan. 12, 2012), available at [http://www.blm.gov/co/st/en/BLM\\_Information/newsroom/2012/blm\\_seeks\\_comments0.html](http://www.blm.gov/co/st/en/BLM_Information/newsroom/2012/blm_seeks_comments0.html).

<sup>290</sup> BLM, NEPA Register, DOI-BLM-CO-N040-2016-0005-CX (Whittaker Flats 12-16AH Horizontal Well), available at <https://eplanning.blm.gov/epl-front-office/eplanning/projectSummary.do?methodName=renderDefaultProjectSummary&projectId=54106>, and DOI-BLM-CO-N040-2015-0088-CX (Three New Horizontal Wells from the Winter Flats 10-31-99AH Well Pad), available at <https://eplanning.blm.gov/epl-front-office/eplanning/projectSummary.do?methodName=renderDefaultProjectSummary&projectId=51895>; *see also* Exhibit C (spreadsheet of pending or approved horizontal well projects in Upper Basin).

<sup>291</sup> *See* COGCC Database for Black Hills wells data, available at <http://cogcc.state.co.us/data.html#/cogis> (last visited Sept. 12, 2016) (Exhibit L) (Winter Flats wells 10-31-99-AH, -CH, and -DH marked xx, denoting permitted well location). Another federal horizontal well proposed by Black Hills and approved by COGCC in this unit has yet to be drilled or completed, but it is unclear whether BLM has issued an APD. *Compare id.* (noting COGCC approved well 10-31-99BH) *with* BLM, NEPA Register, available at [https://eplanning.blm.gov/epl-front-office/eplanning/nepa/nepa\\_register.do](https://eplanning.blm.gov/epl-front-office/eplanning/nepa/nepa_register.do) (no record of well 10-31-99 -BH).

<sup>292</sup> *Id.*

<sup>293</sup> *See* Exhibit L (missing Whitaker Flats Wells 12-16AH, -BH, -CH, -DH, -EH).

<sup>294</sup> *See* DeBeque Exploratory Proposal Environmental Assessment, Appendix E, Biological Resources Protection Plan (April 11, 2013) at 6-7 (noting reliance on PBO measures); *see also* Letter from Service to Center (July 14, 2016) ("All horizontal wells drilled in the BLM Grand Junction Field Office area in FY2014-FY2016...fit under the umbrella of the PBO and were included within the framework of the PBO. No additional or separate Section 7 consultation was needed or conducted for these wells.").

Shale within the Grand Junction Field Office over a 20-year period.<sup>295</sup> Purportedly, these plans have been modified to allow a total of 80 wells over a three to five year period.<sup>296</sup> In each of the plans, Black Hills projects that each well could consume over 350,000 barrels water per well (over 11,000,000 gallons or 33.83 acre-feet per well), an unspecified portion of which could be produced water.<sup>297</sup> But as evidenced above, this figure could be a gross underestimate. BLM and the Service have previously maintained that horizontal wells “fit under the umbrella of the PBO,” even if their depletions exceed the sub-basin depletion threshold.<sup>298</sup>

Another master development project proposed by SG Interests I, Ltd. (SGI) within the Gunnison River sub-basin would allow the development of numerous horizontal wells, including wells targeting the Mancos shale play.<sup>299</sup> The Bull Mountain MDP is projected to deplete 744.1 acre-feet of fresh water over a six-year period, or an average of 124 acre-feet of fresh water per year.<sup>300</sup> This annual average is over seven times the annual water depletion threshold for the Gunnison River sub-basin (16 acre-feet per year),<sup>301</sup> the most likely source of water for the project. BLM and the Service, however, have improperly relied on the Fluid Mineral PBO to comply with its Section 7 consultation duties.<sup>302</sup> BLM is expected to issue a record of decision in summer or fall of 2016.<sup>303</sup>

BLM’s approval and authorization of continued oil and gas leasing and development in the Upper Colorado River Basin in Colorado, including Black Hills’ and SGI’s planned activities, along with a number of other federal horizontal drilling projects proposed in the Upper Basin,<sup>304</sup> pose “a reasonably certain threat of imminent harm” to the endangered fish,<sup>305</sup> necessitating an injunction against any new federal horizontal drilling activity throughout the Upper Basin. Allowing these activities will result in a violation of the clear terms of the PBO, abrogating the

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<sup>295</sup> Webb, Dennis, Black Hills proposing 104-well gas project, *The Daily Sentinel* (June 10, 2015), available at <http://www.gjsentinel.com/news/articles/black-hills-proposing-104-well-gas-project>; Black Hills Plateau Production, LLC, Proposed Action: DeBeque Southwest Master Development Plan for Oil and Gas Exploration and Development Mesa County, Colorado, DOI-BLM-CO-N040-2015-0024-EA (May 2015), available at [https://eplanning.blm.gov/epl-front-office/projects/nepa/48239/58991/64183/DeBeque\\_Southwest\\_MDP\\_Proposed\\_Action.pdf](https://eplanning.blm.gov/epl-front-office/projects/nepa/48239/58991/64183/DeBeque_Southwest_MDP_Proposed_Action.pdf); BLM seeks public comment on Homer Deep Unit proposal near De Beque (Mar. 30, 2015), available at [http://www.blm.gov/co/st/en/BLM\\_Information/newsroom/2015/blm\\_seeks\\_public\\_comment5.html](http://www.blm.gov/co/st/en/BLM_Information/newsroom/2015/blm_seeks_public_comment5.html).

<sup>296</sup> Tel. Comm. between Wendy Park and BLM, Colorado River Valley Field Office, Project Lead Allen Crockett on or around May 6, 2016.

<sup>297</sup> DeBeque Southwest Master Development Plan Proposed Action at 4; Homer Deep Master Development Plan at 4. Some unspecified portion of water could be supplied by recycled or produced water. *Id.*

<sup>298</sup> Letter from Service to Center (July 14, 2016) (Exhibit J).

<sup>299</sup> See BLM, Uncompahgre Field Office, Final Environmental Impact Statement for the Bull Mountain Unit Master Development Plan, DOI-BLM-CO-S050-2013-0022-EIS, 2-26, D-8, available at [http://www.blm.gov/co/st/en/BLM\\_Information/nepa/ufo/Bull\\_Mountain\\_EIS.html](http://www.blm.gov/co/st/en/BLM_Information/nepa/ufo/Bull_Mountain_EIS.html) (“Bull Mountain FEIS”).

<sup>300</sup> Bull Mountain FEIS at ES-8 Table ES-1, ES-10-11.

<sup>301</sup> See PBO at 5.

<sup>302</sup> See Bull Mountain FEIS at 4-161.

<sup>303</sup> [http://www.blm.gov/co/st/en/BLM\\_Information/nepa/ufo/Bull\\_Mountain\\_EIS.html](http://www.blm.gov/co/st/en/BLM_Information/nepa/ufo/Bull_Mountain_EIS.html).

<sup>304</sup> See Exhibit C (listing proposed or approved projects, which include horizontal drilling).

<sup>305</sup> *Defenders of Wildlife v. Bernal*, 204 F.3d 920, 925 (9th Cir. 2000); *Animal Welfare Institute v. Beech Ridge Energy*, 675 F. Supp. 2d 540, 563 (D. MD 2009).

safe harbor provision of the ITS.<sup>306</sup> BLM is thereby subject to ESA Section 9 take liability for authorizing these activities.<sup>307</sup> Until BLM and the Service properly consult over the effects of these activities, they must not be allowed to move forward.

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For the forgoing reasons, the Service and BLM have failed to comply with Section 7 of the ESA and its implementing regulations, and the APA. The Service and BLM must immediately reinitiate formal consultation on the Fluid Mineral Program and the Grand Junction and White River RMPs, and must maintain the environmental status quo until such consultations are complete. Specifically, until such consultations are complete BLM may not rely on the Fluid Mineral PBO or on other documents that tier to the PBO, for any new approval, including approvals of oil and gas leases, master development plans, gathering lines, access roads, and Applications for Permit to Drill (APD) under existing leases, or otherwise allow any irreversible and irretrievable commitment of resources under an existing lease.

For example, on May 12, 2016, BLM sold leases for two parcels within the Little Snake Field Office in the Colorado River Basin.<sup>308</sup> Although BLM and the Service do not appear to have consulted over the lease sale or expressly tiered any evaluation of the lease sale to the PBO, compliance with Section 7 for the lease sale and for any APDs on such leases depends on the validity of the Fluid Mineral PBO.<sup>309</sup> Thus, BLM may not issue an APD on these leases, or otherwise allow the development and completion of new wells on these leases, until BLM reinitiates and completes consultation on the PBO, or separately consults on the lease sale and APD.

Furthermore, BLM is in violation of ESA Section 9 for continuing to authorize and allow oil and gas development activities that are or will result in take of the endangered fish. No drilling of horizontal federal wells may move forward in the Upper Colorado River Basin in western Colorado absent full compliance with the ESA.

Please do not hesitate to contact me if I can provide additional information on this topic or otherwise assist in this matter. We look forward to your prompt response.

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<sup>306</sup> *Or. Natural Desert Ass'n v. Tidwell*, 716 F. Supp. 2d 982, 1005 (D. Or. 2010); *see also South Yuba*, 629 F. Supp. 2d at 1132; *Bennett*, 520 U.S. at 170; *National Wildlife Federation*, 481 F.3d at 1230; *Mount Graham Red Squirrel*, 986 F.2d at 1580.

<sup>307</sup> 16 U.S.C. § 1538(a)(1)(B). Allowing activities that may harm federally-protected species, such as surface coal mining, opens up the state and private actors to liability under Section 9 of the ESA. Regulations adopted by the FWS under section 4(d) of the Act apply the ESA's take prohibition to threatened species. 50 C.F.R. §§ 17.31(a), 17.21 (making it "unlawful for any person ... to commit, to attempt to commit, to solicit another to commit or to cause to be committed ... take").

<sup>308</sup> BLM, Competitive Oil & Gas Lease Sale, Summary of May 12, 2016 Sale, available at [http://www.blm.gov/style/medialib/blm/co/programs/oil\\_and\\_gas/Lease\\_Sale/2016/may.Par.43014.File.dat/May\\_20\\_16\\_Results.pdf](http://www.blm.gov/style/medialib/blm/co/programs/oil_and_gas/Lease_Sale/2016/may.Par.43014.File.dat/May_20_16_Results.pdf).

<sup>309</sup> *See* BLM, Colorado State Office, Response to Center for Biological Diversity's Protest of May 12, 2016 Competitive Oil & Gas Lease Sale (May 12, 2016), available at [http://www.blm.gov/style/medialib/blm/co/programs/oil\\_and\\_gas/Lease\\_Sale/2016/may.Par.97571.File.dat/May\\_20\\_16\\_Response\\_all.zip](http://www.blm.gov/style/medialib/blm/co/programs/oil_and_gas/Lease_Sale/2016/may.Par.97571.File.dat/May_20_16_Response_all.zip) (asserting that consultation on PBO was still valid as to the lease sale).

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