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DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

[Docket No. FWS–R1–ES–2014–0002]

[FXES11130900000C6–145–FF09E42000]

RIN 1018–BA28

Endangered and Threatened Wildlife and Plants; Removing the Oregon Chub from the List of Endangered and Threatened Wildlife

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Proposed rule; availability of draft post-delisting monitoring plan.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), propose to remove (delist) the Oregon chub (*Oregonichthys crameri*) from the Federal List of Endangered and Threatened Wildlife. This proposed action is based on a thorough review of the best available scientific and commercial information, which indicates that the Oregon chub

has recovered and no longer meets the definition of an endangered species or a threatened species under the Endangered Species Act of 1973, as amended (Act). Our review of the status of this species shows that the threats to this species have been eliminated or reduced and populations are stable so that the species is not currently, and is not likely to again become, a threatened species within the foreseeable future in all or a significant portion of its range. This proposed rule, if made final, would remove the currently designated critical habitat for the Oregon chub throughout its range. We also announce the availability of a draft post-delisting monitoring plan for the Oregon chub. We seek information, data, and comments from the public regarding this proposal to delist the Oregon chub and on the draft post-delisting monitoring plan.

DATES: We will accept comments received or postmarked on or before [INSERT DATE 60 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]. Please note that if you are using the Federal eRulemaking Portal (see **ADDRESSES**), the deadline for submitting an electronic comment is Eastern Standard Time on this date. We must receive requests for public hearings, in writing, at the address shown in the **FOR FURTHER INFORMATION CONTACT** section by [INSERT DATE 45 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

ADDRESSES: You may submit comments by one of the following methods:

(1) *Electronically*: Go to the Federal eRulemaking Portal: *http://www.regulations.gov*. In the Search box, enter FWS–R1–ES–2014–0002, which is the docket number for this rulemaking. Then, in the Search panel on the left side of the

screen, under the Document Type heading, click on the Proposed Rules link to locate this document. You may submit a comment by clicking on "Comment Now!"

(2) *By hard copy*: Submit by U.S. mail or hand-delivery to: Public Comments Processing, Attn: FWS–R1–ES–2014–0002; Division of Policy and Directives Management; U.S. Fish and Wildlife Service; 4401 N. Fairfax Drive, MS 2042–PDM; Arlington, VA 22203.

We request that you send comments **only** by the methods described above. We will post all comments on *http://www.regulations.gov.* This generally means that we will post any personal information you provide us (see the **Public Comments** section below for more information).

Document availability: The proposed rule and draft post-delisting monitoring plan are available on *http://www.regulations.gov.* In addition, the supporting file for this proposed rule will be available for public inspection, by appointment, during normal business hours, at the Oregon Fish and Wildlife Office, 2600 SE 98th Avenue, Portland, Oregon, 97266, telephone 503–231–6179. Persons who use a telecommunications device for the deaf (TDD) may call the Federal Information Relay Services (FIRS) at 800–877–8339.

FOR FURTHER INFORMATION CONTACT: Paul Henson, State Supervisor, telephone: 503–231–6179. Direct all questions or requests for additional information to: Oregon Chub Information Request, U.S. Fish and Wildlife Service, Oregon Fish and

Wildlife Office, 2600 SE 98th Avenue, Portland, Oregon, 97266. Individuals who are hearing-impaired or speech-impaired may call the Federal Relay Service at 1–800–877–8337 for TTY assistance.

SUPPLEMENTARY INFORMATION:

Information Requested

We intend that any final action resulting from this proposal will be based on the best available scientific and commercial data and will be as accurate and as effective as possible. Therefore, we invite Tribal and governmental agencies, the scientific community, industry, and other interested parties to submit comments or recommendations concerning any aspect of this proposed rule and the draft post-delisting monitoring plan. Comments should be as specific as possible.

We are specifically requesting comments on:

(1) Biological information concerning the Oregon chub, including competition and predation from nonnative species and the loss or alteration of habitat through natural or anthropogenic processes;

(2) Relevant data concerning any current or likely future biological or environmental threats which may lead to a decline in the Oregon chub, such that it meets the definition of a threatened or endangered species;

(3) Whether we could improve or modify our post-delisting monitoring (PDM) plan methods to provide information critical to the long-term persistence of the Oregon chub;

(4) Whether the triggers and responses described under the PDM plan provide adequate protection for the species during the 9-year duration of the plan;

(5) Additional information regarding management plans or other mechanisms that provide protections to the Oregon chub or their habitats; and

(6) Relevant data on climate change (including any modeling data and projections for the Willamette River basin) and potential impacts to the Oregon chub due to changes in precipitation levels, seasonal stream flows, and water temperatures.

To issue a final rule to implement this proposed action, we will take into consideration all comments and any additional information we receive. Such communications may lead to a final rule that differs from this proposal. All comments, including commenters' names and addresses, if provided to us, will become part of the supporting record.

You may submit your comments and materials concerning the proposed rule by one of the methods listed in the **ADDRESSES** section. Comments must be submitted to *http://www.regulations.gov* before 11:59 p.m. (Eastern Time) on the date specified in the **DATES** section. We will consider any and all comments received, or mailed comments that are postmarked, by the date specified in the **DATES** section.

We will post your entire comment—including your personal identifying information—on *http://www.regulations.gov*. If you provide personal identifying information in your comment, you may request at the top of your document that we withhold this information from public review. However, we cannot guarantee that we will be able to do so.

Comments and materials we receive, as well as supporting documentation we used in preparing this proposed rule, will be available for public inspection on *http://www.regulations.gov*, or by appointment, during normal business hours at the U.S. Fish and Wildlife Service, Oregon Fish and Wildlife Office (see **FOR FURTHER INFORMATION CONTACT**).

Public Hearing

Section 4(b)(5)(E) of the Act provides for one or more public hearings on this proposal, if requested. We must receive requests for public hearings, in writing, at the address shown in the **FOR FURTHER INFORMATION CONTACT** section within 45 days after the date of this **Federal Register** publication (see **DATES**). We will schedule public hearings on this proposal, if any are requested, and announce the dates, times, and places of those hearings, as well as how to obtain reasonable accommodations, in the **Federal Register** at least 15 days before the first hearing.

Peer Review

In accordance with our policy, "Notice of Interagency Cooperative Policy for Peer Review in Endangered Species Act Activities," which was published on July 1, 1994 (59 FR 34270), we will seek the expert opinion of at least three appropriate independent specialists regarding scientific data and interpretations contained in this proposed rule as well as the draft PDM plan. We will send copies of the proposed rule and PDM plan to the peer reviewers immediately following publication in the **Federal Register**. This assessment will be completed during the public comment period. The purpose of such

review is to ensure that our decisions are based on scientifically sound data, assumptions, and analyses. Accordingly, the final decision may differ from this proposal.

Previous Federal Actions

In our December 30, 1982, Review of Vertebrate Wildlife for Listing as Endangered or Threatened Species Under the Act, we listed the Oregon chub as a Category 2 candidate species (47 FR 58454). Category 2 candidates, a designation no longer used, were species for which information contained in Service files indicated that proposing to list was appropriate but additional information was needed to support a listing proposal. The Oregon chub maintained its Category 2 status in both the September 18, 1985 (50 FR 37958), and January 6, 1989 (54 FR 554), Notices of Review.

On April 10, 1990, we received a petition to list the Oregon chub as an endangered species and to designate critical habitat. On November 1, 1990, we published a 90-day finding indicating that the petitioners had presented substantial information indicating that the requested action may be warranted and initiated a status review (55 FR 46080). On November 19, 1991, we published a 12-month finding on the petition concurrent with a proposal to list the species as endangered (56 FR 58348). A final rule listing the Oregon chub as endangered was published in the **Federal Register** on October 18, 1993 (58 FR 53800).

On March 9, 2007, the Institute for Wildlife Protection filed suit in Federal district court, alleging that the Service and the Secretary of the Interior violated their statutory duties as mandated by the Act when they failed to designate critical habitat for

the Oregon chub and failed to perform a 5-year status review (*Institute for Wildlife Protection* v. *U.S. Fish and Wildlife Service*). On March 8, 2007, we issued a notice in the **Federal Register** that we would commence a status review of the Oregon chub (72 FR 10547). In a settlement agreement with the Plaintiff, we agreed to submit a proposed critical habitat rule for the Oregon chub to the **Federal Register** by March 1, 2009, and to submit a final critical habitat determination to the **Federal Register** by March 1, 2010.

A 5-year review of the Oregon chub status was completed in February 2008 (Service 2008a); this review concluded that the Oregon chub's status had substantially improved since the time of listing and that the Oregon chub no longer met the definition of endangered but met the definition of a threatened species under the Act. The review recommended that the Oregon chub should be reclassified from endangered to threatened.

On March 10, 2009, we published a proposed rule (74 FR 10412) to designate critical habitat for the Oregon chub. The public comment period was open for 60 days, from March 10, 2009, to May 11, 2009. We subsequently reopened the public comment period on September 22, 2009, for an additional 30 days ending October 22, 2009 (74 FR 48211). During the reopened public comment period, we held a public hearing in Corvallis, Oregon. We published a final rule designating critical habitat on March 10, 2010 (75 FR 11010), and a technical correction to the final critical habitat rule on April 9, 2010 (75 FR 18107).

On May 15, 2009, we published a proposed rule to reclassify the Oregon chub from endangered to threatened (74 FR 22870). The public comment period on the proposal was open for 60 days from May 15, 2009, to July 14, 2009. On April 23, 2010, we published a final rule reclassifying the federally endangered Oregon chub to

threatened under the authority of the Act (75 FR 21179). The decision was based on a thorough review of the best available scientific and commercial data, which indicated that the species' status had improved to the point that the Oregon chub was not in danger of extinction throughout all or a significant portion of its range.

On May 19, 2009, we published a notice in the **Federal Register** announcing the Oregon Department of Fish and Wildlife (ODFW) application for an enhancement of survival permit under section 10(a)(1)(A) of the Act (74 FR 23431). The permit application included a proposed Programmatic Safe Harbor Agreement between ODFW and the Service (Service 2009, pp. 1–30). We issued the permit on August 31, 2009. The term of the permit and agreement is 30 years. The permit authorizes ODFW to extend incidental take coverage with assurances to eligible landowners who are willing to carry out habitat management measures that would benefit the Oregon chub by enrolling them under the agreement as Cooperators through issuance of Certificates of Inclusion. The geographic scope of the agreement includes all non-Federal properties throughout the estimated historical distribution of the species in the Willamette Valley.

On February 5, 2013, we published a notice in the **Federal Register** announcing the initiation of 5-year status reviews and requesting information for 44 species, including the Oregon chub (78 FR 8185). No information was received from this request. This proposed rule, which considers the same information as required in a status review, will also serve as our 5-year status review for the Oregon chub.

Background

Species Information

Species Description and Life History—The Oregon chub is a small minnow in the Cyprinid family. Young of the year range in length from 7 to 32 millimeters (mm) (0.3 to 1.3 inches), and adults can be up to 90 mm (3.5 inches) in length (Pearsons 1989, p. 17). The Oregon chub reaches maturity at about 2 years of age (Scheerer and McDonald 2003, p. 78) and in wild populations can live up to 9 years. Oregon chub spawn from May through August and are not known to spawn more than once a year.

The Oregon chub is found in slack water off-channel habitats such as beaver (*Castor canadensis*) ponds, oxbows, side channels, backwater sloughs, low-gradient tributaries, and flooded marshes. These habitats usually have little or no water flow, are dominated by silty and organic substrate, and contain considerable aquatic vegetation providing cover for hiding and spawning (Pearsons 1989, p. 27; Markle *et al.* 1991, p. 289; Scheerer and McDonald 2000, p. 1). The average depth of habitat utilized by the Oregon chub is less than 1.8 meters (m) (6 feet), and summer water temperatures typically exceed 16° Celsius (61° Fahrenheit). Adult Oregon chub seek dense vegetation for cover and frequently travel in the mid-water column in beaver channels or along the margins of aquatic plant beds. Larval Oregon chub congregate in shallow near-shore areas in the upper layers of the water column, whereas juveniles venture farther from shore into deeper areas of the water column (Pearsons 1989, p. 16). In the winter months, the Oregon chub can be found buried in the detritus or concealed in aquatic vegetation (Pearsons 1989, p. 16). Fish of similar size school and feed together. In the early spring, Oregon chub are most active in the warmer, shallow areas of aquatic habitats.

The Oregon chub is an obligatory sight feeder (Davis and Miller 1967, p. 32). They feed throughout the day and stop feeding after dusk (Pearsons 1989, p. 23). The Oregon chub feeds mostly on water column fauna. The diet of Oregon chub adults collected in a May sample consisted primarily of minute crustaceans including copepods, cladocerans, and chironomid larvae (Markle *et al.* 1991, p. 288). The diet of juvenile Oregon chub also consists of minute organisms such as rotifers and cladocerans (Pearsons 1989, p. 2).

Range—The Oregon chub is endemic to the Willamette River drainage of western Oregon. Historical records show the Oregon chub was found as far downstream as Oregon City and as far upstream as the town of Oakridge. At the time of listing in 1993, there were only nine known populations of Oregon chub, and only a few estimates existed of the number of individuals within each population. These locations represented a small fraction (estimated as 2 percent based on stream miles) of the species' formerly extensive distribution within the Willamette River drainage.

Abundance and Distribution—Since we listed the Oregon chub as endangered in 1993, the status of the species has improved dramatically due to the discovery of many new populations and successful reintroductions within the species' historical range (Scheerer 2007, p. 97). Recently, since we reclassified the Oregon chub to threatened status in 2010, a substantial number of new Oregon chub populations have been discovered (28 populations) and established through introductions (8 populations). In 2012, the ODFW confirmed the existence of the Oregon chub at 79 locations in the Luckiamute River, North and South Santiam River, McKenzie River, Middle Fork and Coast Fork Willamette Rivers, and several tributaries to the mainstem Willamette River

downstream of the Coast Fork and Middle Fork Willamette River confluence (Bangs *et al.* 2012, pp. 7–9). These include 59 naturally occurring and 20 introduced populations. Currently, 36 Oregon chub populations have an estimated abundance of more than 500 fish each; and 20 of these populations have also exhibited a stable or increasing trend over the last 7 years (Bangs *et al.* 2012, p. 1). The current status of Oregon chub populations meets the goals of the recovery plan for delisting. The distribution of these sites is shown in Table 1.

Table 1. Distribution of Oregon chub populations meeting recovery criteria for delisting (Bangs *et al.* 2012, pp. 7–9).

Recovery Subbasin	**Number of Populations**	**Number of Large Populations (≥500 adult fish)**	**Number of Large Populations with Stable/Increasing Abundance Trend**	**Total Estimated Abundance in Subbasin**
Santiam	17	11	5	29,070
Mainstem Willamette[1]	25	9	6	146,509
Middle Fork Willamette	33	15	9	44,999
Coast Fork Willamette[2]	4	1	0	962
Total	79	36	20	221,540

[1] Includes McKenzie River subbasin.
[2] The Coast Fork Willamette was identified as a subbasin containing the Oregon chub in the Recovery Plan, but was not identified as a Recovery Area.

Although certain populations of the Oregon chub have remained relatively stable from year to year, substantial fluctuations in population abundance have been observed. For instance, the largest known population at Ankeny National Wildlife Refuge had an estimated abundance of 21,790 Oregon chub in 2010 and increased to 96,810 Oregon chub in 2011. Cyclical fluctuations in Oregon chub population abundance are commonly

observed. For instance, Dexter Reservoir Alcove "PIT1" had an estimated population abundance of 140 in 1995. Although annual estimated abundance fluctuated, the population reached 1,440 estimated individuals in 2000. A decline in population abundance followed, and the 2004 population estimate was 70 Oregon chub. In 2005 the population again began to increase, and reached 1,370 estimated individuals in 2009 (Scheerer *et al.* 2005, p. 2).

A major component of recovery efforts for the Oregon chub has been introducing Oregon chub into hydrologically isolated habitats that are free from nonnative fish species. Twenty new populations have been established since 1988 (Table 2). In 2012, there were 13 introduced populations with more than 500 Oregon chub each; 6 of these populations have exhibited a stable or increasing 7-year abundance trend (Bangs *et al.* 2012, p. 15).

Table 2. Introduced Oregon chub populations (Bangs *et al.* 2012, pp. 7–9, 16) (MS–Mainstem Willamette River, S–Santiam River, CF–Coast Fork Willamette River, MF–Middle Fork Willamette River).

Site Name	Subbasin	Year of First Introduction	Number of Fish Introduced	Estimated Abundance
Dunn Wetland	MS	1997	573	44,160
Finley Display Pond	MS	1998	500	220
Russell Pond	MS	2001	500	340
Finley Cheadle Pond	MS	2002	530	204
Ankeny Willow Marsh	MS	2004	500	82,800
St. Paul Ponds	MS	2008	195	510
Finley-Buford Pond	MS	2011	160	460
Murphy Pond	MS	2011	214	189
Ellison Pond	MS	2012	110	111
Foster Pullout Pond	S	1999	500	2,240
South Stayton Pond	S	2006	439	2,000
North Stayton Pond	S	2010	620	4,370
Budeau South Pond	S	2010	312	4,160
Budeau North Pond	S	2010	310	5,730

Herman Pond	CF	2002	400	190
Sprick Pond	CF	2008	65	700
Wicopee Pond	MF	1992	178	5,620
Fall Creek Spillway Ponds	MF	1996	500	6,750
Haws Enhancement Pond	MF	2009	133	900
Hills Creek Pond	MF	2010	1,127	13,460

Genetic Diversity—The Service's Abernathy Fish Technology Center conducted a genetic analysis on the Oregon chub in 2010 (DeHaan *et al.* 2010). The analysis examined genetic diversity at 10 microsatellite loci within and among 20 natural and 4 introduced populations. The findings suggest that four genetically distinct groups of the Oregon chub exist and these groups corresponded to the four subbasins of the Willamette River. Levels of genetic diversity were consistent across distribution and equal to, or greater than, other species of minnows (i.e., cyprinids). Most populations were stable over time at sites where genetic diversity was evaluated at a 7- to 8-year interval (three to four Oregon chub generations). Data suggests that adequate levels of genetic diversity exist in most populations. Two sites were shown to have reduced genetic diversity: a recent bottleneck was observed in the Shetzline population, and the Geren Island population showed evidence of decreasing diversity, possibly due to significant reductions in the population size. Currently, both of these sites support abundant populations of the Oregon chub, which have exhibited an increasing trend in population growth over the last 7 years (Bangs *et al.* 2012, pp. 7–8).

The report resulting from the genetic assessment (DeHaan *et al.* 2010, p. 18) shows that the current Oregon chub translocation guidelines (ODFW 2006) are effective in establishing genetically viable populations (donor population from within same

subbasin, and a minimum of 500 Oregon chub introduced). Levels of genetic diversity were similar to natural populations in three out of four of the introduced sites studied. Introduced populations from multiple sources had increased diversity and showed evidence of interbreeding. The Dunn wetland population, which had three donor populations, had the highest genetic diversity of all sites (natural and introduced). The Wicopee Pond population had relatively low levels of genetic diversity, which was likely due to this population being founded with only 50 Oregon chub originating from 1 source population. These data support introducing greater numbers of individuals and using multiple sources from within a subbasin.

Recovery and Recovery Plan Implementation

Background—Section 4(f) of the Act directs us to develop and implement recovery plans for the conservation and survival of endangered and threatened species unless we determine that such a plan will not promote the conservation of the species. Under section 4(f)(1)(B)(ii), recovery plans must, to the maximum extent practicable, include: "Objective, measurable criteria which, when met, would result in a determination, in accordance with the provisions of [section 4 of the Act], that the species be removed from the list." Recovery plans may be revised to address continuing or new threats to the species, as new, substantive information becomes available. The recovery plan identifies site-specific management actions that will achieve recovery of the species, measurable criteria that set a trigger for review of the species' status, and methods for monitoring recovery progress.

Recovery plans are nonregulatory documents that are intended to establish goals for long-term conservation of listed species, define criteria that are designed to indicate when the threats facing a species have been removed or reduced to such an extent that the species may no longer need the protections of the Act, and provide guidance to our Federal, State, other governmental and nongovernmental partners on methods to minimize threats to listed species. Thus, while recovery plans provide important guidance on methods of minimizing threats to listed species and measurable objectives against which to measure progress towards recovery, they are not regulatory documents and cannot substitute for the determinations and promulgation of regulations required under section 4(a)(1) of the Act. A decision to revise the Federal List of Endangered and Threatened Plants (50 CFR 17.11) (adding, removing, or reclassifying a species) must reflect determinations made in accordance with sections 4(a)(1) and 4(b) of the Act. Section 4(a)(1) requires that the Secretary determine whether a species is endangered or threatened (or not) because of one or more of five threat factors: (A) The present or threatened destruction, modification, or curtailment of its habitat or range; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; (D) the inadequacy of existing regulatory mechanisms; or (E) other natural or human-made factors affecting its continued existence. Section 4(b) of the Act requires that the determination be made "solely on the basis of the best scientific and commercial data available." Therefore, recovery criteria should indicate when a species is no longer an endangered species or threatened species under the five statutory factors.

There are many paths to accomplishing recovery of a species, and recovery may be achieved without all criteria being fully met. For example, one or more criteria may

be exceeded while other criteria may not yet be accomplished. In that instance, we may determine that the threats are minimized sufficiently and the species is robust enough to delist. In other cases, recovery opportunities may be discovered that were not known when the recovery plan was finalized. These opportunities may be used instead of methods identified in the recovery plan. Likewise, information on the species may be discovered that was not known at the time the recovery plan was finalized. The new information may change the extent to which criteria need to be met for recognizing recovery of the species. Recovery of a species is a dynamic process requiring adaptive management that may, or may not, fully follow the guidance provided in a recovery plan.

Recovery Planning—The Oregon Chub Working Group, which was formed prior to listing the species, has been a proactive force in improving the conservation status of the Oregon chub. This group of Federal and State agency biologists, academicians, land managers, and others has met each year since 1991 to share information on the status of the Oregon chub, results of new research, and ongoing threats to the species. Additionally, an interagency conservation agreement was established for the Oregon chub in 1992 (ODFW *et al.* 1992). The objectives of the agreement were to: (1) establish a task force drawn from participating agencies to oversee and coordinate Oregon chub conservation and management actions; (2) protect existing populations; (3) establish new populations; and (4) foster greater public understanding of the species, its status, and the factors that influence it (ODFW *et al.* 1992, pp. 3–5). These objectives are similar to that of the subsequently developed recovery plan.

The Recovery Plan for the Oregon Chub was approved by the Service on September 3, 1998 (Service 1998). The recovery plan outlines recovery criteria to assist

in determining when the Oregon chub has recovered to the point that the protections afforded by the Act are no longer needed. These delisting criteria are: (1) 20 populations of at least 500 individuals each are established and maintained; (2) all of these populations must exhibit a stable or increasing trend for 7 years; (3) at least 4 populations (meeting criteria 1 and 2) must be located in each of the 3 subbasins (Mainstem Willamette, Middle Fork Willamette, and Santiam Rivers); and (4) management of these 20 populations must be guaranteed in perpetuity (Service 1998, pp. 27–28).

Recovery Plan Implementation—The status of the Oregon chub has improved dramatically since it was listed as endangered. The improvement is due largely to the implementation of actions identified in the interagency conservation agreement and the Oregon chub recovery plan. This includes the establishment of additional populations via successful introductions within the species' historical range and the discovery of many new populations as a result of ODFW's surveys of the basin (Scheerer 2007, p. 97). Twenty years have passed since the species was listed, and it is now abundant and well-distributed throughout much of its presumed historical range. Currently, there are 79 Oregon chub populations, of which 36 have more than 500 adults (Bangs *et al.* 2012, pp. 6–12). The risk of extinction has been substantially reduced as threats have been managed and as new populations have been discovered or established. The Oregon chub has exceeded or met the following criteria for delisting described in the recovery plan:

Delisting Criterion 1: 20 populations of at least 500 individuals are established and maintained. This criterion has been exceeded; in 2012, we identified 36 populations with more than 500 adult Oregon chub (Table 1).

Delisting Criterion 2: All of these populations (20) must exhibit a stable or increasing trend for 7 years. This criterion has been met. Currently, 20 populations of at least 500 individuals have exhibited a stable or increasing trend for 7 years (Table 1).

Delisting Criterion 3: At least four populations (meeting criteria 1 and 2) must be located in each of the three subbasins (Mainstem Willamette, Middle Fork, and Santiam Rivers). This criterion has been exceeded in all three subbasins. Six populations in the Mainstem Willamette River subbasin, nine populations in the Middle Fork Willamette River subbasin, and five populations in the Santiam River subbasin meet the first three delisting criteria (Table 1).

Delisting Criterion 4: Management of these 20 populations must be guaranteed in perpetuity. The level of management protection recommended in the Oregon chub recovery plan (i.e., management guaranteed into perpetuity) exceeds the requirements of the Act in evaluating whether a species meets the statutory definition of threatened or endangered, as adequate protection for the species in the long term may be provided otherwise. Although we do not have guarantees that all of the populations will be managed into perpetuity, we have a high level of confidence that management of the Oregon chub sites will continue to provide adequate protection for the species in the long term, as further discussed below. However, of the 36 sites with populations of more than 500 Oregon chub, 25 of the sites are in public or Tribal ownership, with either active conservation management programs, or where land managers consider the needs of the Oregon chub when implementing site management activities. Additionally, seven of the sites with abundant populations of the Oregon chub are on land which is privately owned where landowners have signed conservation agreements or are enrolled in our Safe

Harbor Program. These seven sites include land that is in a permanent easement or ownership by the McKenzie River Trust, a land trust which is dedicated to conservation of wetland and riparian habitat. Our analysis of whether the species has achieved recovery is based on the five factors identified in section 4 of the Act, which are discussed next.

Summary of Factors Affecting the Species

Section 4 of the Act and its implementing regulations (50 CFR part 424) set forth the procedures for listing species, reclassifying species, or removing species from listed status. "Species" is defined by the Act as including any species or subspecies of fish or wildlife or plants, and any distinct vertebrate population segment of fish or wildlife that interbreeds when mature (16 U.S.C. 1532(16)). A species may be determined to be an endangered or threatened species due to one or more of the five factors described in section 4(a)(1) of the Act: (A) The present or threatened destruction, modification, or curtailment of its habitat or range; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; (D) the inadequacy of existing regulatory mechanisms; or (E) other natural or manmade factors affecting its continued existence. We must consider these same five factors in delisting a species. We may delist a species according to 50 CFR 424.11(d) if the best available scientific and commercial data indicate that the species is neither endangered nor threatened for the following reasons: (1) The species is extinct; (2) the species has recovered and is no

longer endangered or threatened (as is the case with the Oregon chub); and/or (3) the original scientific data used at the time the species was classified were in error.

A recovered species is one that no longer meets the Act's definition of threatened or endangered. Determining whether a species is recovered requires consideration of the same five categories of threats specified in section 4(a)(1) of the Act. For species that are already listed as threatened or endangered, this analysis of threats is an evaluation of both the threats currently facing the species and the threats that are reasonably likely to affect the species in the foreseeable future following the delisting or downlisting and the removal or reduction of the Act's protections.

A species is "endangered" for purposes of the Act if it is in danger of extinction throughout all or a "significant portion of its range" and is "threatened" if it is likely to become endangered within the foreseeable future throughout all or a "significant portion of its range." The word "range" in the significant portion of its range phrase refers to the range in which the species currently exists. For the purposes of this analysis, we will evaluate whether the currently listed species, the Oregon chub, should be considered threatened or endangered throughout all its range. Then we will consider whether there are any significant portions of the Oregon chub's range where the species is in danger of extinction or likely to become so within the foreseeable future.

The Act does not define the term ''foreseeable future.'' For the purpose of this proposed rule, we defined the ''foreseeable future'' to be the extent to which, given the amount and substance of available data, we can anticipate events or effects, or reliably extrapolate threat trends, such that we reasonably believe that reliable predictions can be made concerning the future as it relates to the status of the Oregon chub. In considering

the foreseeable future as it relates to the status of the Oregon chub, we considered the factors affecting the Oregon chub, historical abundance trends, and ongoing conservation efforts.

The following analysis examines all five factors currently affecting, or that are likely to affect, the Oregon chub within the foreseeable future.

A. The Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Range

When the Oregon chub was listed as endangered in 1993, the species was known to exist at nine locations, representing only 2 percent of the species' historical range (Markle 1991, pp. 288–289; Scheerer *et al.* 2007, p. 2, Service 1993, p. 1). The decline in Oregon chub abundance and distribution was attributed to the extensive channelization, dam construction, and chemical contamination that occurred in the Willamette River basin, particularly from the 1940s through the late 20th century (Pearsons 1989, pp. 29–30).

Since listing, concerted efforts by Federal, State, and local governments and private landowners have greatly reduced the threats to the Oregon chub. For example, the introduction of the Oregon chub into secure habitats has created refugial populations in habitats that are isolated from the threats of habitat loss and invasion by nonnative fishes. Additionally, as explained below, research has expanded our understanding of suitable habitat for the Oregon chub, and increased survey efforts have led to the discovery of many natural populations. And, since 2002, the U.S. Army Corps of

Engineers (USACE) has implemented minimum dam outflow targets that sustain downstream floodplain habitat, which has reduced the threat of habitat loss for the Oregon chub. These minimum flow targets will continue to be required into the future under existing biological opinions from the Service and National Marine Fisheries Service (NMFS) on the USACE's Willamette River Basin Project (see description below). The USACE also has a memorandum of understanding with The Nature Conservancy's Sustainable Rivers Project, an ongoing collaboration to promote ecologically sustainable flows below USACE dams in the Willamette River basin. For these reasons we anticipate that the USACE would continue to meet these minimum flow targets after delisting of the Oregon chub. Also, the acquisition of floodplain habitat for long-term conservation and restoration, including off-channel locations preferred by the Oregon chub, has gained momentum in the Willamette River basin by a variety of Federal, State, Tribal, local governmental and nongovernmental agencies, which provides assurances that Oregon chub habitat will continue to be managed for the species. As a result, the Oregon chub is now abundant and well distributed in several Willamette River basin tributaries at 79 locations.

Since 1992, the Oregon chub has been introduced and established in 20 secure, isolated habitats (Bangs *et al.* 2012, p. 16). These populations contribute to recovery by providing redundancy to the naturally occurring populations, increasing the abundance of the Oregon chub in each recovery area, and providing refugial habitat that is more resistant to the threats of habitat loss and invasion by nonnative fishes. The majority of Oregon chub individuals occur in populations at these introduction sites. In 2012, we estimated 174,730 Oregon chub in the 20 introduced populations. By contrast, we

estimated 46,810 Oregon chub in the 59 naturally occurring populations. Ten of the introduction sites are in public ownership by Federal and State agencies that manage these sites for conservation of the Oregon chub.

The remaining 10 introduction sites are privately owned. Many of these introduction sites were created or restored under the Service's Partners for Fish and Wildlife program managed by the staff of the Willamette Valley National Wildlife Refuge Complex. Most of these landowners have either signed conservation agreements or are participating in our Safe Harbor Program. In the interest of conserving the Oregon chub, our Safe Harbor Program participants volunteered to allow the introduction of the Oregon chub into ponds on their land and signed management plans, called cooperative agreements, which are designed to protect the species and its habitat. In exchange, they were given an incidental take permit that extended an exemption from take prohibitions under section 9 of the Act. If the Oregon chub is delisted, the species will no longer be protected under these take prohibitions and the incidental take permit associated with the safe harbor agreements will no longer be in effect. This means that landowners will no longer be legally bound to protect the species on their property. However, we anticipate, based on their past interest and cooperation in protecting the species, that these landowners will continue to manage their land for conservation of the Oregon chub into the future as described in their cooperative agreements. We will also seek to extend these agreements beyond their initial 10-year time period and, in the event the property is later sold or transferred, we will work with the future landowners to enroll them in a cooperative agreement. Our conclusion that the species has recovered does not, however, rely on an assumption that these landowners will continue managing for conservation.

In the 2008 5-year review of the status of the Oregon chub (Service 2008a, p. 26), we identified concerns about the ability to achieve recovery due to the focus on managing primarily isolated populations with limited genetic exchange. To reduce threats associated with habitat isolation, we suggested that future recovery efforts should integrate habitat that is connected to the floodplain. Successful efforts to integrate floodplain habitat into Oregon chub recovery were facilitated in part through consultation with several Federal agencies under section 7 of the Act. Specifically, in 2008, the Service and NMFS completed consultation with the USACE, Bonneville Power Administration, and the Bureau of Reclamation under section 7 of the Act on the continued operation and maintenance of 13 large flood-control dams in the Willamette River basin, collectively known as the Willamette River Basin Project (Willamette Project). The Service's biological opinion considered the project's effects to the Oregon chub, the bull trout, and bull trout critical habitat (Service 2008b), while the NMFS' biological opinion considered effects to threatened salmon and steelhead (salmonids) and associated critical habitat. The terms and conditions of the Service's biological opinion required the USACE to fund a floodplain study that would increase our understanding of the effects that dam flow management was having on connected downstream Oregon chub habitat. The ODFW subsequently pursued opportunities to study these effects and to integrate floodplain habitat in recovery efforts, in part, through funding provided by the USACE under the terms and conditions of the biological opinion.

The floodplain study required by the Willamette Project biological opinion began in 2009 (Bangs *et al.* 2010a, p. 1). Under this study, ODFW began sampling fish assemblages and monitoring habitat conditions (i.e., bathymetry, pond volume, percent

vegetation, water temperature) in several off-channel habitats in the Middle Fork Willamette River downstream of Dexter dam in Lowell, Oregon, to Jasper, Oregon (Bangs *et al.* 2010a, pp. 2–4). The ODFW chose the Dexter to Jasper reach of the Middle Fork Willamette River as a study area because several off-channel habitats in this reach were known to be occupied by the Oregon chub, and the majority of the adjacent land is in public ownership and accessible.

The ODFW sampled most of the hydrologically connected off-channel habitat in this reach and discovered that the Oregon chub also occupied sites previously thought to be unsuitable. These sites contain greater habitat complexity than sites where Oregon chub were previously known to occur. Although these habitats have features such as beaver dams and shallow inundated benches that were known to provide suitable habitat for the Oregon chub, the recently discovered sites also include channels that have frequent connectivity to the adjacent river channel (Bangs 2013, pers. comm.). Frequently connected sites, such as these, were thought to be unsuitable because these sites could be accessed by nonnative fishes that prey upon or compete with the Oregon chub for resources. The discovery of the Oregon chub in these connected sites facilitated a better understanding of the diversity of habitats occupied by the Oregon chub, and prompted ODFW to shift their basin-wide sampling efforts from primarily focusing on isolated habitats or habitats with infrequent river connection to sampling frequently connected off-channel habitats. They sampled similar habitat in other recovery subbasins and found that the Oregon chub also occupied many of these frequently connected habitats. Between 2009 and 2012, ODFW discovered 28 additional Oregon chub populations throughout the 3 recovery subbasins (Bangs *et al.* 2012, pp. 7–9).

Several anthropogenic and natural environmental factors, discussed below, may continue to have effects on the Oregon chub and its habitat in the foreseeable future. Many of these factors are included in this discussion because they were previously identified as threats to the continued existence of the species in the listing and downlisting rules. Additionally, new factors affecting the species are discussed.

Activities Related to the Willamette Project

The Oregon chub occupies 38 connected habitats that are downstream of Willamette Project dams or adjacent to reservoirs, and are thus influenced by Willamette Project operations. The Willamette Project biological opinions were signed in 2008 and continue until 2023 (NMFS 2008, Service 2008b). In addition to normal operations of the Willamette Project, several actions required under the terms and conditions of the biological opinions may affect Oregon chub populations and habitat in the future.

Temperature and flow augmentation—The USACE is implementing a number of structural and operational changes to alter flows and water temperatures downstream of Willamette Project dams to increase survival of federally listed salmon and steelhead (salmonids). These operational and structural changes have resulted in downstream water temperatures closer to natural conditions that existed prior to the construction of the dams (e.g., river temperatures downstream of the reservoirs are now warmer in early summer, and cooler in the late summer and early fall). The USACE is also operating to meet mainstem and tributary flow objectives identified in the Willamette Project biological opinion to benefit listed salmonids; these flows also benefit the Oregon chub by sustaining floodplain habitat downstream. In addition, the USACE is working with

partners in the Willamette River basin as part of The Nature Conservancy's Sustainable Rivers Project to implement a set of environmental flow objectives designed to improve channel morphology in a manner that would create and sustain new, and improve existing, fish habitat (Gregory *et al.* 2007, p. 11). The effects of water flow augmentation and temperature normalization on fish communities in off-channel habitat are largely unknown. ODFW has a monitoring program in place (Bangs *et al.* 2011) to detect any negative effects on the Oregon chub and its habitat. If the species is delisted as proposed in this rule, this monitoring program, which is detailed in our draft PDM plan, will continue for several years post-delisting (Service and ODFW 2013). The draft PDM plan identifies thresholds and responses for detecting and reacting to significant changes in Oregon chub protected habitat, distribution, and persistence. If declines are detected that exceed the thresholds, the Service, in combination with other PDM participants, will investigate causes of these declines and determine if the Oregon chub warrants expanded monitoring, additional research, additional habitat protection, or relisting as an endangered or threatened species under the Act.

Reservoir drawdowns—As required in the NMFS biological opinion for the Willamette Project, the USACE is implementing an annual complete reservoir drawdown of Fall Creek Reservoir on the Middle Fork Willamette River. The biological objectives of the reservoir drawdown are to improve fish passage efficiency and survival of juvenile Chinook salmon migrating out of Fall Creek Reservoir and to reduce nonnative fish populations inhabiting the Fall Creek Reservoir. This is expected to result in reduced nonnative predation and competition with juvenile Chinook salmon rearing in the

reservoir. While reservoir drawdown benefits Chinook salmon, there are potential negative effects to the Oregon chub from sedimentation of Oregon chub habitats.

Willamette River basin flood control dams inhibit the transport of sediment downstream, causing sedimentation to occur in the reservoirs. During a complete reservoir drawdown, released reservoir water scours the reservoir bed and transports sediment downstream. During the Fall Creek drawdowns, a massive volume of silt, sand, and debris was flushed, causing sediment deposition to occur in off-channel habitats downstream of the dam. Sampling for Oregon chub populations in the Fall Creek drainage occurred after the first drawdown. Three previously undocumented Oregon chub populations were affected by sedimentation resulting from the drawdown. The extent to which these populations were affected is unknown because Oregon chub were discovered at these sites after the sedimentation occurred and we cannot determine the area of habitat or number of Oregon chub that existed prior to the sedimentation. Fewer than five Oregon chub were found in each of these three sites after the sedimentation occurred. These sites experienced the accumulation of fine sediments, perhaps beyond typical historical levels, which reduced the amount of habitat available to Oregon chub (Bangs 2013, pers. comm.). However, little sedimentation was observed in the few Oregon chub habitats that occur further downstream of the confluence of Fall Creek and the Middle Fork Willamette River. Most of the abundant populations of Oregon chub in off-channel habitats of the Middle Fork Willamette River were not affected because they occur upstream of this confluence.

Although partial drawdowns of Willamette Project reservoirs are likely to occur in the near future, they are unlikely to result in large volumes of sediment moving

downstream because the water level will remain above the sediment bed and little sediment will be moved. Complete reservoir drawdowns to the extent seen at Fall Creek are not currently planned at other reservoirs. The effects of a complete reservoir drawdown would vary by location; it is difficult to predict what habitat changes may occur downstream. However, any future proposal to implement this scale of drawdown will include extensive coordination and planning between the Service, ODFW, the USACE, and other land managers. Additionally, in cooperation with the USACE, we have developed monitoring guidance and recommended responses in the event a drawdown is planned (Service and ODFW 2013, pp. 18–19).

Another concern related to drawdowns is that nonnative predatory fishes are common in reservoir habitats. During a drawdown, these fish are likely transported downstream, where they may invade off-channel habitats. The risks to the Oregon chub associated with nonnative fishes are discussed under Factors C and E, below.

Reservoir water level fluctuations—Fluctuating water levels in Lookout Point Reservoir on the Middle Fork Willamette River may limit the breeding success of the Oregon chub population in Hospital Pond, which provides habitat for the species in a pool connected to the reservoir by a culvert (Service 2008b, p. 160). Between 2001 and 2003, the USACE, which manages Lookout Point Reservoir as part of the Willamette Project, implemented a series of actions to protect the population of Oregon chub in Hospital Pond. The goal was to allow the USACE to manage the water level in Lookout Point Reservoir independently of the water elevation in Hospital Pond. In order to achieve this, they installed a gate on Hospital Pond's outlet culvert and lined the porous berm between the pond and reservoir (Service 2002, pp. 1–11). They also excavated

additional areas to create more suitable spawning habitat in the pond (Service 2003, pp. 1–3). Despite these actions, water elevation in Hospital Pond continues to be influenced by reservoir water levels. Hospital Pond currently supports a large, stable population of the Oregon chub; however, future Willamette Project operations may result in reservoir elevations that are below the levels necessary to inundate the spawning habitat in Hospital Pond (Service 2008b, p. 160). This reduction in spawning habitat may result in limited breeding success for the Oregon chub in Hospital Pond into the foreseeable future. However, the Hospital Pond population is not considered as vital as we once thought because additional surveys in the Middle Fork Willamette River subbasin have found that the subbasin has the highest number of Oregon chub populations (33 populations) across the range of the species. Currently, 15 of the Oregon chub sites in this subbasin have abundant (greater than 500 individuals) populations of the Oregon chub. This redundancy of large populations provides additional security to the species in the event that single populations decline.

Inability to meet minimum flow targets—During low water or drought years, the USACE may not be able to meet the seasonal minimum water flow targets established in the Willamette Project biological opinions. This may have negative effects on Oregon chub habitat downstream through a temporary reduction in pond volume and increased water temperatures. Under the floodplain study, the ODFW has mapped the bathymetry and installed equipment to measure pond elevation, area, volume, and temperature in Oregon chub sites that are influenced by Willamette Project flows. This information has been used to determine the effect that low flows may have on the extent of habitat area available to the Oregon chub. The USACE has considered these data in managing flows

and has a notification process in place to coordinate with the Service and ODFW during low water periods before flows are reduced to levels below the minimum flow targets. To date, except for during malfunctions and emergency operations explained below, flows below minimum targets have been of short duration and have not resulted in observable adverse effects to Oregon chub populations (Bangs 2013, pers. comm.).

The minimum flow targets protect not only the Oregon chub, but many other native aquatic species, including listed salmonids. If the Oregon chub is delisted, these minimum flow targets will continue to be required under existing biological opinions from the Service and NMFS on the Willamette Project for listed bull trout, Chinook salmon, and steelhead. Moreover, the USACE was proactive in implementing recommended flows before the Willamette Project biological opinions were completed (USACE 2007, pp. 3–19). Therefore, we anticipate that the USACE will continue to meet these minimum flow targets after delisting of the Oregon chub, except under infrequent, extreme conditions such as drought.

Willamette Project malfunctions and emergency operations resulting in the USACE not meeting minimum flow targets or necessitating restrictions on reservoir pool elevations have affected Oregon chub habitats. These incidents have been infrequent, but resulted in short-term negative effects on a few Oregon chub populations. For instance, in 2009, two of the three spillway gates at the USACE Big Cliff dam on the North Santiam River failed (Bangs *et al.* 2010b, p. 16). While repairing the gates, the outflow from Big Cliff Dam was reduced to below the minimum summer flow target. Record high air temperatures coincided with the low flow levels. Monitoring during this event detected that three Oregon chub sites downstream were nearly desiccated and fish

mortalities were observed. Screened pumps were used to increase the volume of water in the ponds and to reduce water temperatures. The effects of this incident on Oregon chub populations were short term, and the numbers of the Oregon chub in these three populations have either increased or are exhibiting a stable trend (Bangs *et al.* 2012, pp. 7–9).

Additionally, in 2010, the USACE determined that the condition and reliability of the spillway gates at Willamette Project dams represented an unacceptable risk to public safety (USACE 2011, p. 1). To mitigate this risk, they proposed to implement pool elevation restrictions at Willamette Project reservoirs to lower than normal levels to support maintenance and repair of the spillway gates. The imposed restrictions at Dexter Reservoir were likely to reduce the pond level at the adjacent Oregon chub site, PIT1 alcove, below levels critical for Oregon chub survival. The PIT1 alcove had filled in with sediment over the years and in consultation with the USACE it was determined that removing some of this sediment was the best measure to prevent desiccation of the pond. Prior to removing sediment, the ODFW captured and relocated a total of 1,127 Oregon chub to Hills Creek Pond, a site with perennial flow located on USACE property at Hills Creek Dam. This site is within the historical range of the Oregon chub, but at the time was not occupied by the species. The pond site is adjacent to the Middle Fork Willamette River and has historically been managed by USACE staff for wildlife habitat enhancement. The spillway gate repairs were completed, the pool elevation restriction for Dexter Reservoir was lifted in 2011, and the reservoir has returned to normal operations. The Oregon chub population abundance in PIT1 alcove is currently stable and has met the recovery criteria for delisting (Bangs *et al.* 2012, p. 9). The translocation

of the Oregon chub into Hills Creek Pond has provided a large, secure habitat for the species and the population is now the largest Oregon chub population within the Middle Fork Willamette River subbasin with an estimated abundance of 13,460 Oregon chub (Bangs *et al.* 2012, p. 9).

Siltation Resulting from Timber Harvest

Excessive siltation from ground-disturbing activities in the watershed, such as timber harvest upstream of Oregon chub habitat, can degrade or destroy Oregon chub habitat. Minimum riparian management areas, required by the Oregon Forest Practices Act, may be protective of aquatic habitat depending on the harvest methods used (e.g., clearcut versus thinning) and the topography of the land where timber is being harvested, although monitoring water bodies for siltation is not required after harvest.

In the 1990s, timber harvest occurred on lands upstream of East Fork Minnow Creek. Flood events in the watershed in 1996, 1997, and 1998 caused accelerated siltation into East Fork Minnow Creek Pond, a downstream pond that is occupied by Oregon chub, and over half of the habitat was lost (Scheerer 2009, pers. comm.). The Oregon chub population in East Fork Minnow Creek Pond declined dramatically following these events (Scheerer 2009, pers. comm.). In 2010, the Oregon Department of Transportation excavated accumulated sediment in the pond and created a pool that will provide a buffer from the effects of future siltation. This Oregon chub population has increased in abundance from 1,340 Oregon chub in 2009 to 3,330 Oregon chub in 2012. The population has also met the delisting criterion for a stable or increasing trend over 7 years.

In 2012, timber harvest occurred upstream of an Oregon chub site on William L. Finley National Wildlife Refuge (Finley NWR) known as Gray Creek Swamp. Prior to this timber harvest, we negotiated with the landowner who agreed to increase the width of the riparian area not subject to timber harvest in order to reduce the risk of siltation in Oregon chub habitat downstream. To date, siltation of this Oregon chub habitat has not been observed, but the site will continue to be monitored by ODFW during the proposed 9-year post-delisting monitoring period.

The potential for adverse effects to Oregon chub habitat from logging has also been identified at three other sites: Dexter Reservoir PIT1 alcove, Buckhead Creek, and Wicopee Pond (Scheerer 2008, pers. comm.). However, to date we have not observed levels of siltation at these sites that have resulted in habitat loss, and the Oregon chub populations within each of the five sites located downstream of timber activities all met the delisting criteria in 2012. Therefore, although siltation from timber harvest could have effects on the Oregon chub and its habitat, it has not been observed at levels that are causing declines in Oregon chub population abundance.

Floods and Seasonal High-Water Events

The Oregon chub is a low-elevation floodplain dependent species that evolved under dynamic environmental conditions created by seasonal flooding and droughts. As a result, the species' life history reflects these dynamic conditions. While floods and seasonal high-water events constitute a potential stressor to individuals or specific Oregon chub populations, these events create and maintain off-channel habitats necessary

for the long-term persistence of the species, and they function to transport the Oregon chub to colonize these new sites.

For example, in 2007, a flood event in the Santiam River caused channel avulsion (a shift in the stream channel that results in the rapid abandonment of a river channel and formation of a new river channel) at an Oregon chub site, reducing the extent of habitat available at this location and likely negatively affecting this population Yet in another example, between 2000 and 2003, new off-channel habitat was formed in the McKenzie River due to flooding and, after aquatic vegetation became established, the site was subsequently colonized by the Oregon chub (Bangs 2013, pers. comm.). Although we are unable to predict the magnitude or the extent to which current Oregon chub habitats may be affected by flooding and seasonal high water events, the number and distribution of large populations, in combination with habitat heterogeneity, increases the species' resiliency in recovering from periodic disturbances, as the species would have historically.

Water Quality Issues

The analysis of threats in the final rule to list the Oregon chub as an endangered species and the recovery plan for the species discussed numerous potential threats to water quality in Oregon chub habitats. However, in the 20 years since the Oregon chub was listed, only a few of these concerns, discussed below, have materialized, and even then, these were localized and of short duration.

In the spring of 2011, ODFW noted the complete die-off of the introduced Oregon chub population in Cheadle Pond on the Finley NWR. They assessed the water quality

(temperature, pH, and dissolved oxygen) and discovered that the pH level was abnormally high (mean pH: 9.6, range: 8.4–10.2). The pH level in Oregon chub habitats typically ranges between 7.42 and 8.66. The cause of the increased pH level was unknown and has not been observed previously at this site. We have not observed, and do not anticipate, similar incidents in other Oregon chub habitats. ODFW subsequently conducted an in-situ 7-day bioassay using 30 adult Oregon chub from the Gray Creek Swamp population. All of the Oregon chub survived the trial and were released into Cheadle Pond following the bioassay. In April 2012, ODFW confirmed the survival of the Oregon chub that were moved and found that the pH of the water in Cheadle Pond had decreased and was more typical of pH levels observed in other Oregon chub habitats (mean pH: 7.97, range: 7.42–8.66). An additional 184 Oregon chub were translocated from the Gray Creek Swamp population to Cheadle Pond to reestablish the population.

Nutrient enrichment may have caused the extirpation of the Oregon chub population at Oakridge Slough in the Middle Fork Willamette River subbasin. The slough is downstream from the Oakridge Sewage Treatment Plant, and increased nitrogen and phosphorus concentrations were detected in the slough prior to a decline in the population. While the nutrient concentrations are not believed to be directly harmful to the species, the elevated nutrient levels may have contributed to habitat conditions that were unsuitable for Oregon chub (i.e., an increase in growth of algae, which then decomposed and led to low oxygen conditions below what the Oregon chub requires to survive) (Buck 2003, p. 12).

Several Oregon chub sites are located adjacent to agricultural land. Runoff from farm fields may contain pesticides or fertilizers that could adversely affect the water

quality in Oregon chub habitats. However, many of these sites have protective vegetated buffers between crops and the aquatic habitat. To date, we have not observed declines in Oregon chub populations that can be attributed to agricultural practices, and several Oregon chub habitats located adjacent to farmland have supported abundant populations of Oregon chub for many years.

Several Oregon chub sites are located adjacent to private forestland (as previously discussed above under "*Sedimentation Resulting From Timber Harvest"*). Additionally, several Oregon chub sites are managed by the U.S. Forest Service (USFS) within the Willamette National Forest. Forests managed by the USFS operate under land and resource management plans that include management practices protective of fish (USFS 1990, pp. IV–61–64), and we anticipate these resource management plans will continue to guide forest management into the future. On private forestland, the use of chemicals is regulated by the Oregon Department of Forestry, and operators are required to comply with product labels and additional protective measures to protect waters of the State, including leaving untreated vegetated buffers and limiting aerial applications near areas of standing open water larger than one-quarter acre (ORS 527.765 and OAR 629–620–0000 through 629–620–0800). Although we have no information regarding landowners' compliance with these rules on forestland in the vicinity of Oregon chub habitats, we have not observed harmful effects to Oregon chub populations due to chemical exposure related to forestry operations.

Aggradation

Aggradation is an alluvial process where sediment deposition is more rapid than the capacity of a river to transport sediment downstream. We have observed aggradation at the Geren Island North Channel in the North Santiam River. Natural movement of the river channel changed sediment deposition in the upstream end of this location, which had the potential to block water flow into the site. The City of Salem, which manages the site, excavated a portion of the channel to allow free-flowing water to enter the Oregon chub habitat. To date, we have not observed a decline in the Geren Island population; with the exceptions of this site and habitats in Fall Creek, which we discussed previously, no other Oregon chub habitats are currently being negatively impacted by aggradation.

Succession

Succession resulting from the manipulation of river flows was identified as a potential threat to Oregon chub habitat in the downlisting rule (75 FR 21179, April 23, 2010). Succession is a natural, long-term process that ponds go through as they mature. As vegetation dies back seasonally, it is deposited on the substrate of the pond, causing a reduction in water depth over time. Eventually, plant communities shift from aquatic to amphibious wetland plants, and the open water pond will be replaced by seasonal wetland and marsh habitat. Historically, seasonal high flows and alluvial floodplain processes created off-channel habitat, and rejuvenated existing habitats by flushing out sediment and diversifying the aquatic plant community. These processes no longer function as they did historically because flows are regulated under the USACE's Willamette Project. However, in the Willamette River basin, the USACE recently began implementing environmental flows recommended by The Nature Conservancy's Sustainable Rivers

Project. These recommendations call for a more natural flow regime, which includes high-magnitude flows to create and rejuvenate off-channel habitats. Given the memorandum of understanding between the USACE and The Nature Conservancy regarding the Sustainable Rivers Project, and the minimum flows required under existing biological opinions from the Service and NMFS, we anticipate flow management trending towards natural flow regimes below Willamette Project dams will continue to create and rejuvenate off-channel habitats to the benefit of the Oregon chub into the future.

We are not aware of any particular sites that are vulnerable to succession in the near future; however, the sites that remain hydrologically isolated during high flows are cut off from these natural processes, and succession may continue resulting in a reduction of open water habitat. For instance, succession occurred at Herman Pond, an isolated Oregon chub site in the Coast Fork Willamette basin, which led to a reduction in habitat area and a decline in population abundance. In 2005, the site was excavated to remove successional vegetation. This activity was successful in increasing open water habitat and led to an increase in Oregon chub abundance at this location. Given the wide distribution and number of Oregon chub habitats under different land ownership, we are uncertain whether manual modification of chub habitats to reverse the effects of succession will occur in the future following delisting. However, given that we are not aware of any particular sites vulnerable to succession in the foreseeable future, we consider the potential negative impact to the Oregon chub from succession to be very low.

Irrigation Withdrawals

A few Oregon chub sites may be influenced by irrigation water withdrawals. In recent years, at Elijah Bristow Berry Slough in the Middle Fork Willamette River subbasin, a drop in summer water level and a significant decline in Oregon chub abundance coincided with increased irrigation use by a farm located upstream. However, this was an isolated event that we have not observed at other sites. Many Oregon chub populations occur on publicly owned lands or on areas managed for conservation, where direct water withdrawals do not occur. In addition, water levels at habitats adjacent to mainstem river channels are highly dependent on river flow, and are less likely to be negatively impacted by irrigation withdrawals due to the amount of hyporheic (subsurface) flow into these habitats from the adjacent river.

Summary of Factor A

Many of the factors discussed above were previously identified as threats to the continued existence of the Oregon chub. These factors include activities associated with the operation of the Willamette Project dams, sedimentation from timber harvest, floods or high-water events, water quality issues, and succession. Modifications that resulted in the way the Willamette Project dams are currently operated have provided flows that create and sustain off-channel habitat used by the Oregon chub, and we anticipate these flow targets will continue into the future due to requirements under biological opinions from the Service and NMFS, and the Sustainable Rivers Project collaboration between USACE and The Nature Conservancy. Sedimentation from timber harvest is not currently indicated in the decline of any Oregon chub populations, and riparian buffers

protected from timber harvest under State and Federal regulations are expected to provide habitat protection in future timber harvest operations. Flooding and high-water events are largely unpredictable; however, the Oregon chub evolved within a dynamic environment and the current distribution of the Oregon chub in many abundant populations within subbasins and across multiple subbasins reduces the risk that these events will affect a large proportion of the Oregon chub and its habitat. Water quality issues have the potential to affect individual populations but few observations of negative effects due to water quality issues have materialized over the past 21 years that we have been monitoring Oregon chub populations. Succession has been documented at one Oregon chub site and may occur in the future, particularly at sites that are isolated from the floodplain. However, succession is a slow process that can be addressed through ongoing monitoring and habitat management, and is not currently a cause for concern at any of our known sites.

Other factors that may affect the Oregon chub and its habitat include actions required under the terms and conditions of the Willamette Project biological opinions, aggradation, and irrigation withdrawals. Actions required under the Willamette Project biological opinions began in 2008, but the effects to Oregon chub habitat from these actions are not well understood, as the focus of most of these actions is recovery of listed salmonids. Research into the effects of these actions on off-channel habitats started in 2009 and is continuing for the next few years. This research may lead to an improved understanding of the habitat characteristics that support abundant populations of the Oregon chub in connected habitats and flow management recommendations specific to maintaining Oregon chub habitat. Aggradation from natural causes has been identified at

one Oregon chub site, and aggradation from a complete drawdown of Fall Creek Reservoir resulted in large deposits of sediment in three, previously unknown, Oregon chub habitats. Other than these events, aggradation has not been observed at Oregon chub sites. Irrigation withdrawal has been observed to negatively affect the volume of water available in one Oregon chub habitat in the Middle Fork River subbasin, but is not considered a widespread concern throughout the range of the Oregon chub.

In summary, the factors discussed under Factor A continue to occur across the subbasins occupied by the Oregon chub, but only a few populations have exhibited declines as a result of any of the factors or combination of factors. The threat of habitat loss has been reduced by changes in flow management and by introducing the species into secure, isolated habitats that are not influenced by floodplain processes. We also have a better understanding of the diversity of connected habitats used by the Oregon chub and have discovered many abundant populations in these habitats across multiple subbasins. Therefore, based on the best available information and because we expect that current management practices will continue into the future, we conclude that the present or threatened destruction, modification, or curtailment of its habitat or range does not constitute a substantial threat to the Oregon chub now and is not expected to in the future.

B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

Overutilization for commercial, recreational, scientific, or educational purposes was not a factor in listing, nor is it currently known to be a threat to the Oregon chub.

C. Disease or Predation

Predation by Nonnative Fishes and Amphibians

In the final rule to downlist the Oregon chub (75 FR 21179), we identified predation and competition with nonnative fishes as the primary threat to recovery of the Oregon chub (competition with nonnative fishes is addressed below under Factor E). The Willamette River basin contains 31 native fish species and 29 nonnative species (Hulse *et al.* 2002, p. 44). The large-scale alteration of the Willamette River basin's hydrologic system (i.e., construction of dams and the resultant changes in flood frequency and intensity) has created conditions that favor nonnative, predatory fishes, and reservoirs throughout the basin have become sources of continual nonnative fish invasions in the downstream reaches (Li *et al.* 1987, p. 198). Significant declines in Oregon chub abundance due to the presence of nonnative fishes have been documented. For instance, after floods in 1996, nonnative fish were first collected from several sites containing the Oregon chub in the Santiam River drainage; the two largest populations of Oregon chub (Geren Island North Pond and Santiam Easement) subsequently declined sharply in abundance (Scheerer 2002, p. 1076).

Game fish, which prey upon the Oregon chub, have also been intentionally introduced into Oregon chub habitats. For example, illegal planting of largemouth bass at East Ferrin Pond in the Middle Fork Willamette River drainage coincided with the collapse of an Oregon chub population that had once totaled more than 7,000 fish. Regulatory mechanisms are in place to prevent the translocation of nonnative fish. Within the State of Oregon, with few exceptions, it is unlawful to transport, release or attempt to release any live fish into the waters of this State (Oregon Administrative Rules

(OAR) 635–007–0600). Although similar illegal introductions may still occur in the future, they have historically been infrequent in habitats known to be occupied by the Oregon chub.

Predatory, nonnative centrarchids (bass and sunfish) and *Ameiurus* spp. (bullhead catfish) are common in the off-channel habitats preferred by the Oregon chub (Scheerer 2002, p. 1075), and the Oregon chub is most abundant at sites where nonnative fishes are absent (Scheerer 2007, p. 96). However, ODFW biologists have recently found many abundant Oregon chub populations that coexist with nonnative fish in hydrologically connected habitats (Bangs *et al*. 2011, pp. 21–24). One of the primary objectives of the floodplain study funded under the Willamette Project biological opinion (Service 2008b, see previous discussion under Factor A) is to examine the relationship between the environmental conditions at hydrologically connected sites and the fish community, with a focus on the Oregon chub and nonnative fish. Research conducted under the study will continue to improve our understanding of the effects that nonnative fishes have on the Oregon chub in these connected habitats and will continue to try to explain the habitat conditions that allow the species to coexist. It is apparent from the sampling results to date that the Oregon chub is coexisting with nonnatives more frequently than previously known. The results to date indicate that spatial and seasonal differences in temperature within these off-channel habitats may be providing areas that are suitable for Oregon chub but are not suitable for nonnatives. In other words, the species may be able to coexist because the habitat provides a diverse range of temperatures that appears to result in some habitat partitioning among the species (Bangs *et al.* 2011, pp. 9–10, 16–17).

Currently, 41 percent of all known Oregon chub habitats and 26 percent of the habitats supporting abundant populations (more than 500 Oregon chub) contain nonnative fishes.

In the recovery plan, we also identified predation by bullfrogs as a potential threat to the Oregon chub (Service 1998, p. 13), but we no longer consider this to be true. Bullfrogs are prevalent in most of the habitats occupied by the Oregon chub and their presence has not been correlated to a decline in the abundance of Oregon chub populations (Bangs 2013, pers. comm.). The Oregon chub is not known to be threatened by disease.

Summary of Factor C

Although the habitat conditions that allow the Oregon chub to coexist with nonnative fish are not yet well understood, we have documented several Oregon chub populations, in multiple subbasins, that are abundant despite the presence of nonnative, predatory fish. These Oregon chub populations exist in habitat that is connected to the active floodplain. Ongoing research conducted under the floodplain study funded by the USACE will continue to improve our understanding of the interactions between the Oregon chub and nonnative fishes.

While the presence of nonnative fishes in isolated sites may be associated with higher rates of predation on the Oregon chub, the species has been introduced into 20 isolated habitats that are generally protected from the risk of invasion by nonnative fishes due to the habitat distance from the floodplain or other fish barriers. During major flooding in the Willamette Basin in 1996, these sites remained isolated from neighboring water bodies. The Oregon chub in these secure, isolated sites currently account for more

than 70 percent of all Oregon chub individuals. Therefore, based on the best available information, we conclude that disease and predation do not constitute substantial threats to the Oregon chub now or in the future.

D. The Inadequacy of Existing Regulatory Mechanisms

In evaluating the inadequacy of existing regulatory mechanisms, we first identify threats under one or more of the other four factors that are affecting the species to the extent it meets the definition of a threatened or endangered species under the Act. We then identify and evaluate the adequacy of existing regulatory mechanisms that are designed to prevent or reduce those threats. The Oregon chub, however, is no longer facing threats to its long-term survival under the other four factors, thus the inadequacy of existing regulatory mechanisms is also no longer a threat to the species' continued existence. Therefore, our discussion herein focuses on regulatory mechanisms, not previously discussed, that may provide benefits to the Oregon chub.

The Oregon chub is designated as ''Sensitive-Critical'' by ODFW. Although this designation is a nonregulatory tool, it helps focus wildlife management and research activities, with the goal of preventing species from declining to the point of qualifying as ''threatened'' or ''endangered'' under the Oregon Endangered Species Act (Oregon Revised Statutes (ORS) 496.171, 496.172, 496.176, 496.182 and 496.192). Sensitive-Critical designation encourages, but does not require, the implementation of conservation actions for the species; however, other State agencies, such as the Oregon Department of

State Lands (DSL) and the Water Resources Department, refer to the Sensitive Species List when making regulatory decisions.

Wetlands and waterways in Oregon are protected by both Federal and State laws. Under section 404 of the Clean Water Act (CWA), the USACE regulates the discharge of dredged or fill material into waters of the United States, including navigable waters and wetlands that may contain the Oregon chub. Oregon's Removal-Fill Law (ORS 196.795–990) requires people who plan to remove or fill material in waters of the State to obtain a permit from the DSL. Projects impacting waters often require both a State removal-fill permit, issued by the DSL, and a Federal permit issued by the USACE. A permit is required only if 50 cubic yards or more of fill or removal will occur. The removal-fill law does not regulate the draining of wetlands. Projects permitted under these programs must avoid and minimize impacts to wetlands or waterways, or propose mitigation to replace the functions and values lost as a result of the project (DSL 2013, p. 64). Some actions, however, such as irrigation diversion structure construction and maintenance and other activities associated with ongoing farming operations in existing cropped wetlands, are exempt from CWA requirements. Additionally, projects authorized under a nationwide USACE permit program receive minimal public and agency review unless the action may affect a listed species, in which case, a consultation under section 7 of the Act would be required. Individual permits are subject to a more rigorous review, and may be required for nationwide permit activities with more than minimal impacts.

Under section 303(c) of the CWA, States are required to adopt water quality standards to restore and maintain the chemical, physical and biological integrity of the Nation’s waters. Oregon adopted revised water quality standards for toxic pollutants in

2004. These standards are intended to protect native aquatic species, and are regulated by the Oregon Department of Environmental Quality. The State implements the standards through listing of waters that exceed criteria on the section 303(d) list of the CWA, calculating the Total Maximum Daily Loads (the maximum amount of pollutants that may enter a stream), and issuing or reissuing permits (i.e., National Pollutant Discharge Elimination System). In 2012, we completed consultation under section 7 of the Act on the Environmental Protection Agency's (EPA) proposed approval of the State of Oregon's water quality criteria for toxic pollutants (Service 2012). Although some Oregon chub sites may be affected by point-source discharges (i.e., wastewater treatment facilities and stormwater discharge from a manufacturing plant) and non-point-source discharges (i.e., runoff of agricultural and forestry pesticides and fertilizers) of toxic chemicals, in our consultation with the EPA, we determined that the Oregon chub's exposure to these chemicals at the criteria levels and the resulting effects would not jeopardize the species' continued existence, adversely modify or destroy Oregon chub critical habitat, nor reach levels preventing the Oregon chub from attaining the abundance and distribution criteria for delisting identified in the recovery plan (Service 2012, pp. 351–352).

Summary of Factor D

Although existing regulatory mechanisms offer limited protection to the Oregon chub, we have no indication that other factors, which these mechanisms are designed to address, are likely to occur at such a magnitude as negatively to impact large numbers of the Oregon chub or a substantial area of habitat. Therefore, based on the best available

information, we conclude that the inadequacy of existing regulatory mechanisms does not constitute a substantial threat to the Oregon chub now or in the future.

E. Other Natural or Manmade Factors Affecting Its Continued Existence.

Interspecific Competition with Nonnative Fishes and Amphibians

Along with the adverse impacts of direct predation described in Factor C (above), nonnative fishes compete with the Oregon chub for food resources, such as aquatic invertebrates. Competition with nonnative fishes may contribute to the decline in populations or exclusion of the Oregon chub from suitable habitats. Observed feeding strategies and diet of nonnative fishes, particularly juvenile centrarchids and adult mosquitofish (*Gambusia affinis*) overlap with those described for the Oregon chub (Li *et al.* 1987, pp. 197–198). At South Stayton Pond, a hydrologically isolated site in the Santiam River basin, we observed a population of 6,200 Oregon chub decline to 2,000 after invasion by mosquitofish, a nonnative fish too small to act as a predator on the Oregon chub. The source of this invasion is unknown, but it is likely that the mosquitofish were illegally introduced into the pond. The population has remained around 2,000 for the past 3 years (Bangs 2013, pers. comm.), demonstrating the ability of nonnative fish to competitively suppress Oregon chub populations. It is possible that other populations of the Oregon chub are being suppressed by competition with nonnative fishes. The current abundance of the Oregon chub and distribution throughout floodplain habitats in the Santiam, McKenzie, and Middle Fork Willamette Rivers

indicates that competition by nonnative fish is not affecting Oregon chub populations to the degree that population declines may be observed.

Bullfrogs were identified as a threat to the Oregon chub in the recovery plan (Service 1998, p. 13) because they may compete with the Oregon chub for food resources (e.g., invertebrates). However, bullfrogs are prevalent in most of the habitats occupied by the Oregon chub and their presence has not been correlated with a decline in Oregon chub abundance (Bangs 2013, pers. comm.).

Isolated Populations

Twenty-eight populations of the Oregon chub are currently isolated; 20 of these sites are introduction sites where isolation was intentional in order to provide refugia from the threat of nonnative fishes. Other sites are isolated due to the reduced frequency and magnitude of flood events and the presence of migration barriers such as beaver dams. Managing species in isolation may have genetic consequences. Burkey (1989, p. 78) concluded that, when species are isolated by fragmented habitats, low rates of population growth are typical in local populations, and their probability of extinction is directly related to the degree of isolation and fragmentation. Without sufficient immigration, growth of local populations may be low, and probability of extinction, high (Burkey 1989, p. 78). Although a recent genetic analysis found that the Oregon chub in isolated habitats has levels of genetic diversity equal to or greater than other cyprinids, additional Oregon chub may need to be introduced into these isolated populations in the future to maintain genetic diversity in the event a population shows a significant decline.

In the final rule to reclassify the Oregon chub to threatened, we expressed concern about genetic isolation due to the lack of habitat connectivity between Oregon chub populations. As we stated above in Factor A, we have discovered that many of the habitats occupied by the Oregon chub connect to the adjacent river channel more frequently and for longer duration than previously understood, which may provide opportunities for genetic dispersal. Currently, 51 Oregon chub populations are located in habitat that experiences some level of connectivity to the adjacent river channel; 28 of these populations have been discovered since we downlisted the Oregon chub to threatened status in 2010. Furthermore, ODFW recently documented the Oregon chub in habitat newly created by floodplain processes in the McKenzie River subbasin and documented volitional upstream movement of marked Oregon chub between populations in the Middle Fork Willamette River (Bangs *et al.* 2012, p. 19) and McKenzie River subbasins (Bangs 2013, pers. comm.). These findings demonstrate the ability of the Oregon chub to colonize new habitats and the potential to exchange genetic material between established populations.

Climate Change

Climate change presents substantial uncertainty regarding the future environmental conditions in the Willamette River basin and is expected to place an added stress on the species and its habitats. The Intergovernmental Panel on Climate Change (IPCC) has concluded that recent warming is already strongly affecting aquatic biological systems; this is evident in increased runoff and earlier spring peak discharge in many glacier- and snow-fed rivers (IPCC 2007, p. 8). Projections for climate change in North

America include decreased snowpack, more winter flooding, and reduced summer flows (IPCC 2007, p. 14). Projections for climate change in the Willamette Valley in the next century include higher air temperatures that will lead to lower soil moisture and increased evaporation from streams and lakes (Climate Leadership Initiative (CLI) and the National Center for Conservation Science and Policy 2009, p. 9). While forecasters have high uncertainty regarding the total precipitation projections for the region, effective precipitation (precipitation that contributes to runoff) may be reduced significantly even if total precipitation does not decline (CLI and the National Center for Conservation Science and Policy 2009, p. 9).

Although climate change is almost certain to affect aquatic habitats in the Willamette River basin (CLI 2009, p. 1), researchers have great uncertainty about the specific effects of climate change on the Oregon chub. The Service has developed a strategic plan to address the threat of climate change to vulnerable species and ecosystems; goals of this plan include maintaining ecosystem integrity by protecting and restoring key ecological processes such as nutrient cycling, natural disturbance cycles, and predator–prey relationships (Service 2010; p. 23). The Oregon chub recovery program worked to establish conditions that allow populations of the Oregon chub to be resilient to changing environmental conditions and to persist as viable populations into the future. Our recovery program for the species focused on maintaining large populations distributed across the species' entire historical range in a variety of ecological settings (e.g., across a range of elevations). This approach is consistent with the general principles of conservation biology. In their review of minimum population viability literature, Traill *et al.* (2009, p. 3) found that maintenance of large populations

across a range of ecological settings increases the likelihood of species persistence under the pressures of environmental variation, and facilitates the retention of important adaptive traits through the maintenance of genetic diversity. Maintaining multiple populations across a range of ecological settings, as described in the recovery plan, increases the likelihood that many abundant populations will persist under the stresses of a changing climate.

Summary of Factor E

Interspecific competition with nonnative fishes, isolation from genetic exchange, and climate change may affect Oregon chub populations in the future. However, we have only observed population declines related to competition with nonnative fishes in one Oregon chub population, which occurs in a small habitat area with limited resources. Although this decline was substantial (abundance of 6,000 chub declined to 2,000 chub in one season), the population has since stabilized and persists with about 2,000 chub (Bangs *et al.* 2012, p. 8). We have documented numerous additional abundant Oregon chub populations in habitats that are connected to the floodplain, which facilitates potential genetic exchange between populations. This has reduced the risk of a reduction in genetic diversity. The risks associated with climate change have been reduced by the distribution of many abundant populations in diverse habitats across multiple subbasins. Therefore, based on the best available information, we conclude that other natural or manmade factors do not constitute a substantial threat to the Oregon chub now or in the future.

Cumulative Impacts

Some of the factors discussed in the previous five-factor analysis could work in concert with one another or synergistically to create cumulative impacts to Oregon chub populations. For example, effects from flow and temperature changes downstream of Willamette Project dams may coincide with an increase in nonnative fish species that prey upon and compete with Oregon chub. Although the types, magnitude, or extent of cumulative impacts are difficult to predict, we are not aware of any combination of factors that has not already, or would not be, addressed through ongoing conservation measures that we expect to continue post-delisting and into the future, as described above. The best scientific and commercial data available indicates that the species is genetically diverse, abundant, and well-distributed throughout the recovery subbasins and that the factors are not currently, nor are they anticipated to, cumulatively cause declines in Oregon chub populations or its habitat.

Overall Summary of Factors Affecting Oregon Chub

The primary factors that threatened the Oregon chub were loss of habitat, predation and competition by nonnative fishes, and the inadequacy of existing regulatory mechanisms. The threats that led to the species being listed under the Act have been removed or ameliorated by the actions of multiple conservation partners over the last 20 years. The introduction of the Oregon chub into several secure habitats has provided populations that are isolated from the threats of habitat loss and invasion by nonnative

fishes. The discovery of many natural populations, including a number of populations that are connected to the active floodplain and coexist with nonnative fishes, has increased our understanding of population persistence in spite of the presence of predators in the species' environment. The implementation of minimum water flows from Willamette Project dams that sustain floodplain habitat downstream has reduced the risk of habitat loss due to altered flows. The acquisition of floodplain habitat for long-term conservation and restoration has provided assurance that Oregon chub habitat will continue to be managed for the species into the future.

Many factors still exist that may affect Oregon chub populations; however, most of these factors have been isolated incidents, and the magnitude of their effects have not been observed on a wide scale across the distribution of Oregon chub populations. The abundance and distribution of known Oregon chub populations has increased each year since the downlisting and has exceeded the goals of our recovery criteria for delisting. When the species was listed in 1993, only nine populations of the Oregon chub within a small, restricted range were known to occur. Oregon chub populations are now known to exist in 79 diverse habitats across multiple subbasins. Listing the species under the Act resulted in the implementation of focused recovery actions that have led to protected, abundant, and well-distributed Oregon chub populations across several Willamette River basin tributaries. We expect conservation efforts will continue to support persistent recovered Oregon chub populations post-delisting and in to the future, as described above. Based on this assessment of factors potentially impacting the species, we consider the Oregon chub to have no substantial threats now or in the future.

Finding

An assessment of the need for a species' protection under the Act is based on whether a species is in danger of extinction or likely to become so because of any of five factors: (A) The present or threatened destruction, modification, or curtailment of its habitat or range; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; (D) the inadequacy of existing regulatory mechanisms; or (E) other natural or manmade factors affecting its continued existence. As required by section 4(a)(1) of the Act, we conducted a review of the status of this species and assessed the five factors to evaluate whether the Oregon chub is endangered or threatened throughout all of its range. We examined the best scientific and commercial information available regarding the past, present, and future threats faced by the species. We reviewed the information available in our files and other available published and unpublished information, and we consulted with recognized experts and other Federal, State, and Tribal agencies.

In considering what factors might constitute threats, we must look beyond the mere exposure of the species to the factor to determine whether the exposure causes actual impacts to the species. If there is exposure to a factor, but no response, or only a positive response, that factor is not a threat. If there is exposure and the species responds negatively, the factor may be a threat and we then attempt to determine how significant the threat is. If the threat is significant, it may drive, or contribute to, the risk of extinction of the species such that the species warrants listing as endangered or threatened as those terms are defined by the Act. This determination does not necessarily require empirical proof of a threat. The combination of exposure and some corroborating

evidence of how the species is likely impacted could suffice. The mere identification of factors that could impact a species negatively is not sufficient to compel a finding that listing is appropriate; we require evidence that these factors are operative threats that act on the species to the point that the species meets the definition of an endangered species or threatened species under the Act.

We found that Oregon chub populations are well-distributed among several subbasins and that many large, stable, or increasing populations have existed with no evidence of decline over the last 7 or more years. During our analysis, we did not identify any factors that are likely to reach a magnitude that threatens the continued existence of the species; significant impacts at the time of listing that could have resulted in the extirpation of all or parts of populations have been eliminated or reduced since listing, and we do not expect any of these conditions to substantially change post-delisting and into the future. We conclude that the previously recognized impacts to the Oregon chub from the present or threatened destruction, modification, or curtailment of its habitat or range (specifically, operation of USACE's Willamette Project dams, sedimentation from timber harvest and floods, water quality issues, and succession) (Factor A); predation by nonnative species (Factor C); and interspecific competition with nonnatives, isolation from genetic exchange, and climate change (Factor E), do not rise to a level of significance, such that the species is in danger of extinction now or in the foreseeable future. Thus, our analysis indicates that the Oregon chub is not likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range and does not, therefore, meet the definition of a threatened or endangered species.

Significant Portion of the Range

Having examined the status of Oregon chub throughout all its range, we next examine whether the species is in danger of extinction in a significant portion of its range. The range of a species can theoretically be divided into portions in an infinite number of ways. However, there is no purpose in analyzing portions of the range that have no reasonable potential to be significant or in analyzing portions of the range in which there is no reasonable potential for the species to be endangered or threatened. To identify only those portions that warrant further consideration, we determine whether substantial information indicates that: (1) The portions may be "significant" *and* (2) the species may be in danger of extinction there or likely to become so within the foreseeable future. Depending on the biology of the species, its range, and the threats it faces, it might be more efficient for us to address the significance question first or the status question first. Thus, if we determine that a portion of the range is not "significant," we do not need to determine whether the species is endangered or threatened there; if we determine that the species is not endangered or threatened in a portion of its range, we do not need to determine if that portion is "significant." In practice, a key part of the determination that a species is in danger of extinction in a significant portion of its range is whether the threats are geographically concentrated in some way. If the threats to the species are essentially uniform throughout its range, no portion is likely to warrant further consideration. Moreover, if any concentration of threats to the species occurs only in

portions of the species' range that clearly would not meet the biologically based definition of "significant," such portions will not warrant further consideration.

We considered whether any portions of the Oregon chub range might be both significant and in danger of extinction or likely to become so in the foreseeable future. One way to identify portions would be to identify natural divisions within the range that might be of biological or conservation importance. Based on our review of the best available information concerning the distribution of the species and the potential threats, we have determined that the Oregon chub does not warrant further consideration to determine if there is a significant portion of the range that is threatened or endangered. The geographic range of the Oregon chub can readily be divided into four subbasins (Santiam, Mainstem Willamette, Middle Fork Willamette, and Coast Fork Willamette Rivers). Although some of the factors we evaluated in the **Summary of Factors Affecting the Species** section above occur in specific habitat types (i.e., hydrologically connected sites versus isolated sites) within these subbasins, the factors affecting the Oregon chub generally occur at similarly low levels throughout its range. Because the low level of potential threats to the species is essentially uniform throughout its range, the species is not endangered or threatened in a portion of its range and no portion warrants further consideration to determine if it is significant.

We have carefully assessed the best scientific and commercial data available and determined that the Oregon chub is no longer threatened with becoming endangered throughout all or a significant portion of its range within the foreseeable future. We conclude the Oregon chub no longer requires the protection of the Act, and, therefore, we are proposing to remove it from the Federal List of Endangered and Threatened Wildlife.

Available Conservation Measures

Conservation measures provided to species listed as endangered or threatened under the Act include recognition, recovery actions, requirements for Federal protection, and prohibitions against certain practices. Recognition through listing encourages and results in conservation actions by Federal, State, and private agencies, groups, and individuals. The Act provides for possible land acquisition and cooperation with the States and requires that recovery actions be carried out for all listed species. This proposed rule, if made final, would remove these Federal conservation measures for Oregon chub.

Effects of the Rule

This proposal, if made final, would revise 50 CFR 17.11(h) to remove the Oregon chub from the Federal List of Endangered and Threatened Wildlife. The prohibitions and conservation measures provided by the Act, particularly through sections 7 and 9, would no longer apply to this species. Federal agencies would no longer be required to consult with the Service under section 7 of the Act in the event that activities they authorize, fund, or carry out may affect the Oregon chub. This proposed rule, if made final, would also revise 50 CFR 17.95(e) to remove the currently designated critical habitat for the Oregon chub throughout its range.

Post-Delisting Monitoring

Section 4(g)(1) of the Act requires us, in cooperation with the States, to implement a monitoring program for not less than 5 years for all species that have been recovered and delisted (50 CFR 17.11, 17.12). The purpose of this post-delisting monitoring (PDM) is to verify that a species remains secure from risk of extinction after it has been removed from the protections of the Act, by developing a program that detects the failure of any delisted species to sustain itself. If, at any time during the monitoring period, data indicate that protective status under the Act should be reinstated, we can initiate listing procedures, including, if appropriate, emergency listing under section 4(b)(7) of the Act.

A draft PDM plan has been developed for the Oregon chub, building upon and continuing the research that was conducted during the listing period. The draft PDM plan will be peer reviewed by experts in the scientific community and available for public comment upon the publication of this proposed rule. Public and peer review comments submitted in response to the draft PDM plan will be addressed within the body of the plan and summarized in an appendix to the plan. The draft PDM plan was developed by the Service and ODFW. In addition, the USACE, USFS, Oregon Parks and Recreation Division, McKenzie River Trust, and Willamette Valley National Wildlife Refuge Complex have agreed to cooperate with us in the implementation of the PDM. The draft PDM plan consists of: (1) a summary of the species' status at the time of proposed delisting; (2) an outline of the roles of PDM cooperators; (3) a description of monitoring methods; (4) an outline of the frequency and duration of monitoring; (5) an outline of

data compilation and reporting procedures; and (6) a definition of thresholds or triggers for potential monitoring outcomes and conclusions of the PDM.

The draft PDM plan proposes to monitor Oregon chub populations following the same sampling protocol used by ODFW prior to delisting. Monitoring will consist of three components: Oregon chub distribution and abundance, potential adverse changes to Oregon chub habitat due to environmental or anthropogenic factors, and the distribution of nonnative fishes in Oregon chub habitats. The PDM period consists of three 3-year cycles (9 years total), which will begin after the final delisting rule is published. The Willamette Project biological opinion continues until 2023, and flow and temperature augmentation will be implemented during this period. Monitoring through this time period will allow us to address any possible negative effects to the Oregon chub associated with changes to flow and temperatures. We will collect data on three generations of Oregon chub in each of the three subbasins, which will allow time to observe fluctuations in population abundance that may be attributed to residual stressors. Sites included in the floodplain study will be sampled annually over the next 9 years in order to continue data collection that will be used to recommend flow and temperature regimes that are beneficial to native fishes. However, sites outside the floodplain study will be sampled only once during each 3-year cycle. This sampling schedule will result in annual sampling costs being reduced from current levels.

The draft PDM plan identifies measurable management thresholds and responses for detecting and reacting to significant changes in Oregon chub protected habitat, distribution, and persistence. If declines are detected equaling or exceeding these thresholds, the Service in combination with other PDM participants will investigate

causes of these declines, including considerations of habitat changes, substantial human persecution, stochastic events, or any other significant evidence. The result of the investigation will be to determine if the Oregon chub warrants expanded monitoring, additional research, additional habitat protection, or relisting as a threatened or endangered species under the Act. If relisting the Oregon chub is warranted, emergency procedures to relist the species may be followed, if necessary, in accordance with section 4(b)(7) of the Act.

The final PDM plan and any future revisions will be posted on our Endangered Species Program's national web page (*http://endangered.fws.gov*) and on the Oregon Fish and Wildlife Office's web page (*http://www.fws.gov/oregonfwo/*).

Required Determinations

Clarity of the Rule

We are required by Executive Orders 12866 and 12988 and by the Presidential Memorandum of June 1, 1998, to write all rules in plain language. This means that each rule we publish must:

(a) Be logically organized;

(b) Use the active voice to address readers directly;

(c) Use clear language rather than jargon;

(d) Be divided into short sections and sentences; and

(e) Use lists and tables wherever possible.

If you feel that we have not met these requirements, send us comments by one of the methods listed in **ADDRESSES**. To better help us revise the rule, your comments

should be as specific as possible. For example, you should tell us the names of the sections or paragraphs that are unclearly written, which sections or sentences are too long, the sections where you feel lists or tables would be useful, etc.

Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.)

This rule does not contain any new collections of information that require approval by the Office of Management and Budget (OMB) under the Paperwork Reduction Act. This rule will not impose recordkeeping or reporting requirements on State or local governments, individuals, businesses, or organizations. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number.

National Environmental Policy Act

We have determined that environmental assessments and environmental impact statements, as defined under the authority of the National Environmental Policy Act of 1969 (42 U.S.C. 4321 *et seq*.), need not be prepared in connection with regulations pursuant to section 4(a) of the Act. We published a notice outlining our reasons for this determination in the **Federal Register** on October 25, 1983 (48 FR 49244).

References Cited

A complete list of all references cited in this final rule is available at *http://www.regulations.gov* at Docket No. FWS–R1–ES–2014–0002.
or upon request from the Oregon Fish and Wildlife Office (see **ADDRESSES**).

Authors

The primary authors of this proposed rule are staff members of the Service's Oregon Fish and Wildlife Office (see **ADDRESSES** and **FOR FURTHER INFORMATION CONTACT)**.

List of Subjects in 50 CFR Part 17

Endangered and threatened species, Exports, Imports, Reporting and recordkeeping requirements, Transportation.

Proposed Regulation Promulgation

Accordingly, we hereby propose to amend part 17, subchapter B of chapter I, title 50 of the Code of Federal Regulations, as set forth below:

PART 17—ENDANGERED AND THREATENED WILDLIFE AND PLANTS

1. The authority citation for part 17 continues to read as follows:

AUTHORITY: 16 U.S.C. 1361–1407; 16 U.S.C. 1531–1544; 16 U.S.C. 4201–4245; unless otherwise noted.

2. Amend § 17.11(h) by removing the entry for "Chub, Oregon" under "Fishes" from the List of Endangered and Threatened Wildlife.

3. Amend § 17.95(e) by removing the entry for “Oregon Chub (*Oregonichthys crameri*)”.

Dated: January 27, 2014

Stephen Guertin

Acting Director, U.S. Fish and Wildlife Service

Billing Code 4310–55

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