

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF OREGON

NORTHWEST ENVIRONMENTAL
DEFENSE CENTER, WILDEARTH
GUARDIANS, and NATIVE FISH
SOCIETY,

No. 3:18-cv-00437-HZ

OPINION & ORDER

Plaintiffs,

v.

UNITED STATES ARMY CORPS OF
ENGINEERS and NATIONAL MARINE
FISHERIES SERVICE,

Defendants.

CITY OF SALEM and MARION COUNTY,

Intervenor-Defendants.

HERNÁNDEZ, District Judge:

Before the Court is Plaintiffs Northwest Environmental Defense Center, WildEarth Guardians, and Native Fish Society's motion for injunctive relief. The Court GRANTS in part and DENIES in part Plaintiffs' motion.

BACKGROUND

The history of this case is well known to the parties and was thoroughly discussed in the Court’s Opinion and Order on Defendants’ liability. *See Nw. Env’t Def. Ctr. v. U.S. Army Corps of Eng’rs* (“NEDC”), 479 F. Supp. 3d 1003 (D. Or. 2020). Relevant here, Upper Willamette River (“UWR”) Chinook salmon and UWR steelhead (collectively “salmonids”) were listed as “threatened” under the Endangered Species Act (“ESA”) in 1999. 50 C.F.R. § 223.102. The salmonids’ status remains threatened; however, Defendant National Marine Fisheries Service (“NMFS”), the federal agency responsible for administration of the ESA with respect to the listed salmonids, has recently been considering downgrading their status to “endangered.” USACE 049439. Defendant U.S. Army Corps of Engineers (“Corps”) operates the Willamette Valley Project (“WVP”)—a network of 13 federally owned dams and related facilities located in the Willamette River Basin.

In 2008, NMFS, in consultation with the Corps, issued a Biological Opinion (“BiOp”) analyzing the impacts the WVP has on the listed salmonids. NMFS found that “lack of passage is one of the single most significant adverse effects on both the fish and their habitat,” and “[w]ater quality problems are one of the major limiting factors in [downstream] habitat[.]” BiOp 9-33, 9-52, 9-61.¹ NMFS set forth a suite of Reasonable and Prudent Alternatives (“RPAs”) necessary to avoid jeopardizing the existence and recovery of the listed salmonids and destroying or adversely modifying the salmonids’ critical habitat. Under the relevant RPAs, the Corps is required to:

- (1) Outplant adult salmonids above Green Peter Dam (South Santiam subbasin) if deemed necessary by NMFS.

¹ The 2008 BiOp begins at NMFS 0001. *See* Notice of Lodging of the Admin. Record, ECF 88. For ease of reference, the Court refers to the BiOp’s original page numbers rather than the Bates numbers.

- (2) By May 2011 and until permanent downstream passage facilities are constructed, carry out and study interim operational measures to pass juvenile salmonids as safely and efficiently as possible downstream through WVP reservoirs and dams, including such measures as reservoir drawdowns, pulsing flow releases, use of non-turbine passage routes, and spill operations.
- (3) Beginning in 2008, conduct a deep drawdown at Fall Creek Reservoir (Middle Fork Willamette subbasin) to pass juvenile fish more safely through the regulating outlet.
- (4) Build and begin operating permanent downstream fish passage facilities at:
 - (a) Cougar Dam (McKenzie subbasin) by 2015;
 - (b) Lookout Point Dam and Dexter Dam (Middle Fork Willamette subbasin) by March 2022; and
 - (c) Detroit Dam and Big Cliff Dam (North Santiam subbasin) by March 2024.
- (5) Study and plan a fourth downstream passage facility that can be built and operated shortly after the BiOp's term ends in 2023.
- (6) Carry out and study interim water quality measures (operational and minor physical modifications) to achieve temperature control and reduce exceedances of total dissolved gas ("TDG") limits until permanent water quality control facilities can be constructed.
- (7) By March 2019, build and begin operating a water temperature control tower at Detroit Reservoir (North Santiam subbasin).
- (8) Develop and implement protocols to protect water quality during emergency and unusual events.

BiOp 9-33–36, 9-42, 9-48–58, 9-61–9-67.

The Corps has not begun operating any of the permanent downstream passage structures required by the BiOp's RPAs and will not meet any of the future deadlines for doing so; has essentially abandoned plans to build a facility at Lookout Point Dam; and has not begun studying or planning to construct the fourth fish passage facility discussed in the BiOp. *NEDC*, 479 F. Supp. 3d at 1014. Except for the annual deep drawdown at Fall Creek Reservoir, the Corps has not consistently carried out downstream fish passage measures in the WVP. *Id.* at 1015. The Corps also has not constructed the water temperature control tower at Detroit Dam. *Id.* at 1014. As early as 2017, NMFS determined it was necessary and, as provided in the RPA, requested the Corps begin outplanting adult UWR Chinook salmon above Green Peter Dam. Pl. Ex. 85, ECF 118-23. The Corps has refused to do so. *Id.*

Shortly after Plaintiffs filed this action, the Corps and NMFS reinitiated formal ESA consultation in April 2018. Initially, Defendants estimated that they would complete consultation and issue a new biological opinion in 2022; they now estimate they will finish consultation by the end of 2023. Def. Resp. 5, ECF 130. It took Defendants eight years to complete the 2008 BiOp. The status of the species has continued to decline since the 2008 BiOp was issued, and the Corps' operation of the WVP is a cause of that decline. *NEDC*, 479 F. Supp. 3d at 1017; Fourth Schroeder Decl. ¶¶ 10, 12, 17-23, ECF 119; Fifth Schroeder Decl. ¶¶ 8-11, ECF 144.

On August 17, 2020, the Court concluded that the Corps is violating the ESA because its operation of the WVP is jeopardizing the survival and recovery of the listed salmonids and is "taking" the species in excess of the BiOp's Incidental Take Statement ("ITS"). *NEDC*, 479 F. Supp. 3d at 1018, 1023. The Court also determined that the Corps' and NMFS' multi-year delay in reinitiating ESA consultation after it became clear that the Corps was not carrying out the critical RPA measures was a substantial procedural violation of the ESA, as to the Corps, and the

Administrative Procedure Act, as to NMFS. *Id.* at 1027. Now in the remedial phase of this case, Plaintiffs move for injunctive relief to remedy Defendants’ substantive and procedural ESA violations. The state of Oregon, as *amicus curiae*, largely supports Plaintiffs’ proposed remedial measures.

STANDARDS

Interim injunctions, such as those sought by Plaintiffs here, are not preliminary in the conventional sense because the Court has already decided the merits of this case. The relief sought, however, is also not permanent in the conventional sense because it may be lifted after Defendants issue a new biological opinion. *See Nat’l Wildlife Fed’n v. Nat’l Marine Fisheries Serv.* (“*NWF VII*”), No. 3:01-CV-0640-SI, 2017 WL 1829588, at *2 (D. Or. Apr. 3, 2017), *aff’d in part, appeal dismissed in part*, 886 F.3d 803 (9th Cir. 2018) (“*NWF VIII*”). “Thus, the first prong of the [permanent] injunction test should be modified to match the analogous prong in the preliminary injunction test, such that “[P]laintiffs must show that they are ‘likely to suffer irreparable harm in the absence of preliminary relief.’” *NWF VIII*, 886 F.3d at 817 (quoting *Winter v. Nat. Res. Def. Council, Inc.*, 555 U.S. 7, 20 (2008)).

To obtain such “interim injunctive measures,” Plaintiffs must therefore demonstrate: (1) they are likely to suffer irreparable harm in the absence of the requested relief; (2) remedies available at law, such as monetary damages, are inadequate to compensate Plaintiffs’ injury; (3) the balance of hardships between Plaintiffs and Defendants warrants a remedy in equity; and (4) the public interest would not be disserved by an injunction. *Id.* If the Court determines that injunctive relief is warranted, such relief must be tailored to remedy the specific harm.

Melendres v. Arpaio, 784 F.3d 1254, 1265 (9th Cir. 2015) (“We have long held that injunctive

relief must be tailored to remedy the specific harm alleged.”) (quotation marks omitted)). “[T]he district court has broad discretion in fashioning a remedy.” *Id.*

DISCUSSION

The Court has jurisdiction to enforce the ESA’s mandates, 16 U.S.C. § 1540(g)(1), and “has many remedial tools at its disposal, including declaratory relief or an injunction[.]” *Winter*, 555 U.S. at 33. Plaintiffs seek a suite of interim injunction measures, including deadlines for key analyses; operational measures and structural improvements to address fish passage and water quality issues; and research and monitoring, adaptive management, and other miscellaneous relief.

First, Plaintiffs request a deadline of December 2024 for the Corps and NMFS to complete reinitiated ESA consultation and issue a new biological opinion on the WVP. Plaintiffs also seek a December 2021 deadline for the Corps to complete a study of alternatives to downstream passage options at Cougar Dam under a “no power” scenario (“Cougar 2.0 Study”).

Second, Plaintiffs propose interim operational measures, including deep reservoir drawdowns in late fall to pass juvenile fish through the dams’ regulating outlets instead of the hydropower turbines; spill operations to move juvenile fish more quickly through the reservoirs and avoid passage through the turbines; collecting and planting adult salmonids above Green Peter Dam so the fish can access prime spawning habitat and downstream juvenile fish passage can be studied; using lower regulating outlets to better meet fall water temperature targets; and spreading spill to reduce TDG levels below the dams.

Third, Plaintiffs seek an order requiring the Corps to design and build a structural solution to reduce TDG levels below Big Cliff Dam; construct permanent adult fish release sites in the South Santiam subbasin; repair the failed fish weir or build a new structural downstream

passage solution at Foster Dam; apply a fish friendly coating to the regulating outlets and install a structural solution to reduce vertical plunge at Cougar Dam; and improve the Dexter Dam adult fish facility.

Finally, Plaintiffs request an order directing the Corps to fund studies monitoring downstream passage survival, migration timing, and water quality parameters during the interim operations. Plaintiffs move the Court to assign a Technical Advisory Team comprised of fish biologists that will direct the Corps on how to carry out the interim measures. Plaintiffs also request an injunction requiring the Corps to strictly follow maintenance outage schedules; seek a rule change to Oregon's water quality standards for TDG levels; update the 2012 Operational Measures Evaluation Team ("OMET") Report; provide biannual status reports on the Corps' implementation of the interim measures; and post all completed studies on a publicly accessible website.

I. Irreparable Harm

A plaintiff "must show irreparable injury to justify injunctive relief." *Cottonwood Env't L. Ctr. v. U.S. Forest Serv.*, 789 F.3d 1075, 1091 (9th Cir. 2015). "In light of the stated purposes of the ESA in conserving endangered and threatened species and the ecosystems that support them, establishing irreparable injury should not be an onerous task[.]" *Id.* (citing 16 U.S.C. § 1531).

Plaintiffs argue that, absent their requested relief, they will likely suffer irreparable harm to their recreational and aesthetic interests in the UWR salmonids during the time it takes Defendants to complete reinitiated ESA consultation. Plaintiffs contend the Court's ruling on summary judgment makes clear that, without significant changes to improve juvenile fish passage and water quality, the Corps' operations will continue to kill and injure, i.e., "take," an

unlawful amount of juvenile salmonids and will continue to jeopardize the species' survival and recovery. Therefore, argue Plaintiffs, the Court must order the Corps to carry out Plaintiffs' proposed injunction measures to prevent this irreparable harm.

In a familiar line of reasoning already rejected by the Court and again rejected here, the Corps contends that Plaintiffs cannot demonstrate irreparable harm because the salmonids' status, although declining, has not been downgraded from "threatened" to "endangered"; the species' decline is largely due to other causes that have recently started improving, such as sea lion predation, non-native hatchery fish, and poor ocean conditions;² and the harm to the salmonids is caused by the existence of the dams, not the Corps' operations. *NEDC*, 479 F. Supp. 3d at 1017-18 (finding the Corps' assertion that it was not jeopardizing the species because their ESA-listing has not been elevated from "threatened" to "endangered" revealed a "fundamental misunderstanding of the ESA on the Corps' part"); *see also Alaska v. Lubchenco*, 723 F.3d 1043, 1054 (9th Cir. 2013), *as amended on denial of reh'g and reh'g en banc* (Oct. 16, 2013) ("The goal of the ESA is not just to ensure survival, but to ensure that the species recovers to the point that it can be delisted.").

The Corps also argues that carrying out actions that "take" individual juvenile fish or that are not necessarily in furtherance of the salmonids' recovery do not constitute irreparable harm. Rather, Plaintiffs must show irreparable harm to the species as a whole. The Corps further asserts that Plaintiffs' requested relief should be denied because the Corps has adopted its own package

² Notwithstanding Mr. Piaskowski's assertion to the contrary, a one-year bump in the number of returning fish is not a dependable measure of the status of the species; rather, several years of data are necessary to reliably determine any trend in species abundance. Second Piaskowski Decl. ¶¶ 9, 12, ECF 134; Fourth Schroeder Decl. ¶¶ 10, 12, 17-23; Fifth Schroeder Decl. ¶¶ 8-11 (noting "a couple of errors" in Mr. Piaskowski's count of the 2020 winter steelhead and Chinook salmon return and that "regardless of these errors, comparing a single year's return to previous averages is a meaningless measure for assessing the status of a population, much less a trend").

of interim measures that will avoid irreparably harming the salmonids. *See* ECF 130-1, 178-2. The Court disagrees.

As evinced by the listed species' continuing decline, the Corps' failure to provide adequate fish passage and mitigate water quality issues is causing substantial, irreparable harm to the salmonids. *NEDC*, 479 F. Supp. 3d at 1017 (D. Or. 2020) ("Far short of moving towards recovery, the Corps is pushing the UWR Chinook and steelhead even closer to the brink of extinction."); *see also Nat'l Wildlife Fed'n v. Burlington N. R.R.*, 23 F.3d 1508, 1512 n.8 (9th Cir. 1994) ("We are not saying that a threat of extinction to the species is required before an injunction may issue under the ESA. This would be contrary to the spirit of the statute, whose goal of preserving threatened and endangered species can also be achieved through incremental steps."). Furthermore, Defendants' failure to timely reinstitute ESA-consultation, which the Court found to be a substantial procedural violation, is causing continuing harms and adverse effects to the listed species. *NEDC*, 479 F. Supp. 3d. at 1025. Consistent with the opinions of NMFS, Plaintiffs' experts, and the Oregon Department of Fish and Wildlife, the Court finds that the Corps' interim measures do not adequately address the lack of volitional fish passage and water quality issues in the WVP. *See, e.g.*, Pl. Exs. 63-64, 66, 70-75, ECF 118; Fifth Schroeder Decl.; Fourth Domingue Decl.

The evidence demonstrates that volitional fish passage is biologically necessary, and spill operations and deep drawdown measures represent the most effective means for providing safe fish passage under current dam configurations. Fourth Schroeder Decl. ¶¶ 38-39; Third Domingue Decl. ¶¶ 5, 11. The biological justification for these operational measures is relatively straightforward. Juvenile salmonids must pass through the dams to successfully outmigrate to the marine environment. The salmonids typically navigate downstream by following the flow of the

river;³ however, the large, slow-moving reservoirs behind the dams disrupt these natural outmigration cues, making it difficult for the fish to find their way downstream to the dam and lengthening their exposure to predators and pathogens in the reservoirs. Increasing flow via drawdowns and spill operations reduces the size of the reservoir and accelerates the salmonids' navigation to the dam, thereby decreasing their exposure to pathogens and predators. But once the juvenile salmonids reach the dams, they can only pass downstream through the hydropower turbines, regulating outlets ("ROs"), or spillways. For likely obvious reasons, significantly higher fish mortality occurs when the juvenile salmonids pass through the turbines instead of the ROs or spillways, making non-turbine fish passage the safest available option. And, concerning drawdowns specifically, juvenile salmonids are surface-oriented fish, meaning they cannot sound very deep and are unlikely to find the ROs unless the reservoir surface elevation is drawn down within 20 to 25 feet of the outlet opening. Fourth Schroeder Decl. ¶¶ 38-39; Third Domingue Decl. ¶ 11; Pl. Ex. 19, at 76, ECF 36-19; Pl. Exs. 24, 29, ECF 36.

In formulating its interim measures, the Corps did not consider conducting deep drawdowns at Cougar or Lookout Point reservoirs on the basis that it does not have authority under the Flood Control Act of 1950 ("1950 FCA"), Pub. L. No. 81-516, § 204, 64 Stat. 163 (1950), and House Document 531 ("HD 531") to draw the reservoirs below the "power pool" during the "critical power production period, October through March." H.R. Doc. No. 81-531, App. J at 2054. As discussed *infra*, the Corps has discretion under the 1950 FCA and HD 531 to conduct deep drawdowns and water quality measures that preclude hydropower generation for the benefit of the listed salmonids. In addition, water temperatures below Detroit, Green Peter,

³ "The smolts, apparently, prefer not to swim. They face upstream, open their mouths, and permit the current to carry them downstream." *Idaho ex rel. Evans v. Oregon*, 462 U.S. 1017, 1020 n.1 (1983).

and Lookout Point dams continue to be too cold in the summer and too warm in the fall, and TDG exceedances repeatedly occur below Big Cliff Dam. Pl. Ex. 76 at 23-25, 32, 37-40, 67-70, ECF 118-14; Pl. Ex. 77 at 25-27, 34, 40-42, 69-72, ECF 118-15; Pl. Ex. 78 at 4, ECF 118-16.

Because the Corps' interim measures do not adequately address these adverse impacts to the listed salmonids, the Court finds that "continuation of the status quo could result in irreparable harm to [the] threatened species" absent interim measures that improve fish passage and water quality in the WVP. *NWF VIII*, 886 F.3d at 820-22 (finding irreparable harm where the highly precarious status and low abundance of the species made them vulnerable to extinction and operation of the dams caused substantial harm to the salmonids and accounted for most mortality of juveniles migrating downriver); *see also Marbled Murrelet v. Babbitt*, 83 F.3d 1060, 1066 (9th Cir. 1996), *as amended on denial of reh'g* (June 26, 1996) ("A reasonably certain threat of imminent harm to a protected species is sufficient for issuance of an injunction under section 9 of the ESA."); *S. Yuba River Citizens League v. Nat'l Marine Fisheries Serv.*, 804 F. Supp. 2d 1045, 1054-55 (E.D. Cal. 2011) (where fish species had low abundance, declining productivity, and low spatial distribution, and dam operations harmed the species, injunction was warranted pending a new biological opinion); *Hoopa Valley Tribe v. Nat'l Marine Fisheries Serv.*, 230 F. Supp. 3d 1106, 1134, 1137-39 (N.D. Cal. 2017) (finding injunctive relief appropriate for a substantial procedural violation of the ESA and irreparable harm likely where operations threatened listed salmon's abundance, fitness, and resilience, making future protective measures particularly important, and the defendant was unlikely to provide those measures without a court order). And, because the Corps' operation of the WVP threatens the continued existence and recovery of the listed salmonids, Plaintiffs' members will suffer irreparable harm to their recreational and aesthetic interests in the salmonids. *NWF VIII*, 886 F.3d at 822.

Accordingly, Plaintiffs have established they will likely suffer irreparable harm absent injunctive relief.

II. Remaining Injunction Factors

Because the ESA “afford[s] first priority to the declared national policy of saving endangered species” and establishes that the value of endangered species is “incalculable,” *Tennessee Valley Auth. v. Hill*, 437 U.S. 153, 185, 187-88 (1978), “[t]he ESA removes the latter three factors in the four-factor injunctive relief test from [the court’s] equitable discretion.” *NWF VIII*, 886 F.3d at 817; *see also Marbled Murrelet*, 83 F.3d at 1073 (9th Cir. 1996) (“Congress has determined that under the ESA the balance of hardships always tips sharply in favor of endangered or threatened species.”). The court must “presume that remedies at law are inadequate, that the balance of interests weighs in favor of protecting endangered species, and that the public interest would not be disserved by an injunction.” *NWF VIII*, 886 F.3d at 817 (citation omitted).

Contrary to the Corps’ argument, limited agency resources and impacts to power production, recreation, and local economies do not overcome the presumption that the balance of harms and public interest factors tip in Plaintiffs’ favor. *NWF VII*, 2017 WL 1829588, at *6 (“[T]he Court does not weigh the public interest or balance the equities, for example by weighing any potential implications on the power system or costs to the Federal Defendants.”). Furthermore, Plaintiffs’ requested relief does not, as the Corps asserts, frustrate the purposes of the ESA. The bulk of Plaintiffs’ requested remedies are simply RPA measures that the Corps has failed to carry out, have already undergone environmental consultation, and were deemed necessary by NMFS to avoid jeopardy to the listed salmonids under the ESA. The Court therefore concludes that Plaintiffs have established the latter three factors in the four-factor

injunctive relief test. Accordingly, Plaintiffs have demonstrated that they are entitled to interim injunctive measures that will improve fish passage and water quality in the WVP.

III. The Corps' Authority Under the 1950 FCA

The Corps argues that the Court cannot grant Plaintiffs' request for deep drawdown measures at Cougar and Lookout Point dams because it does not have authority to do so under the 1950 FCA. A court may not issue an injunction enforcing the ESA if doing so would cause an agency to violate other statutory requirements. *San Luis & Delta-Mendota Water Auth. v. Jewell*, 747 F.3d 581, 645 n.49 (9th Cir. 2014); *see also Nat'l Ass'n of Home Builders v. Defs. of Wildlife*, 551 U.S. 644, 669 (2007) (holding ESA "§ 7(a)(2)'s no-jeopardy duty covers only discretionary agency actions and does not attach to actions . . . that an agency is *required* by statute to undertake[.]") (emphasis original).

A. Overview of the 1950 FCA and HD 531

In the 1950 FCA, Congress authorized the Corps to build, operate, and maintain the Willamette Valley Project ("WVP") "substantially in accordance with the plans recommended in the report of the Chief of Engineers . . . contained in House Document 531[.]" § 204, 64 Stat. at 179. As a roadmap, HD 531 contains the Chief of Engineers' Report, which in turn recommends adopting the Board of Engineers for Rivers and Harbors' ("Board") Report, which in turn recommends adopting the Division Engineer's Report, which in turn recommends adopting the Portland District's Report. Contained in Appendix J to HD 531, the Portland District's Report is specific to the WVP and contains the power storage allocations that the Corps asserts preclude it from conducting deep drawdowns at the WVP's hydropower dams.

The Chief of Engineers' Report is a "comprehensive plan for development of the Columbia River and its tributaries for flood control, navigation, power development, irrigation,

and other purposes, including fish and wildlife conservation and recreation.” H.R. Doc. No. 81-531 (“HD 531”) at 1. The Chief of Engineers recommended “[t]hat the comprehensive plan outlined in the report of the division engineer, with modifications as outlined herein and in the report of the Board of Engineers for Rivers and Harbors, be approved as the basis for long-range development of the Columbia River Basin” and that the Willamette Basin plan described in the Board’s Report be authorized “*generally in accordance* with the plans outlined in the report of the division engineer *and with such modification as the Chief of Engineers may find advisable.*” *Id.* at 5 (emphasis added).

The Board’s Report presents “a comprehensive plan coordinating existing and potential developments in the Columbia River Basin to perfect a balanced system of project works for the control of floods and the ultimate development for optimum beneficial use of the water resources of the basin.” *Id.* at 8. The Board found that, “[a]fter full consideration of the division engineer’s report and of the additional information presented by local interests at the public hearings and in correspondence, the Board . . . concurs generally in the view of the division engineer.” *Id.* at 18. The Board recommended “[t]hat the comprehensive plan described in the report of the division engineer, be approved as the *general guide* for the further development of the water resources of the basin and that the work listed in the [Willamette Basin Plan] be authorized at this time . . . *generally in accordance* with the plans of the division engineer *and with such modifications thereof as in the discretion of the Chief of Engineers may deem advisable[.]*” *Id.* at 21 (emphasis added).

The Division Engineer’s Report recommended “the comprehensive plan of water resource development . . . be adopted as a *general guide* for the further development of the water resources of the Columbia River Basin . . . and that future plans for water use development give

due consideration to the comprehensive plan outlined herein.” *Id.* at 342 (emphasis added). The Division Engineer provided that the WVP “will be operated in a coordinated manner in the combined interest of flood control, navigation, irrigation, power, drainage, fish and wildlife, recreation, domestic water supply, and stream-polution [sic] abatement.” *Id.* at 248. The Division Engineer’s Report recommended allocating storage capacity in the WVP’s reservoirs for purposes of flood control, hydropower, and joint use. *Id.* at 244. In discussing the need for hydropower development in the WVP, the Division Engineer noted:

[D]uring the winter months when Columbia River and its tributaries east of Cascade Range experience low-water flows, high flows prevail in Willamette Valley streams. These conditions favor development of generating plants in Willamette River sub-basin which could be operated on a low load-factor to supply a part of the peak-power requirements of that area and to supplement Columbia River Basin power during the low-flow season on Columbia River.

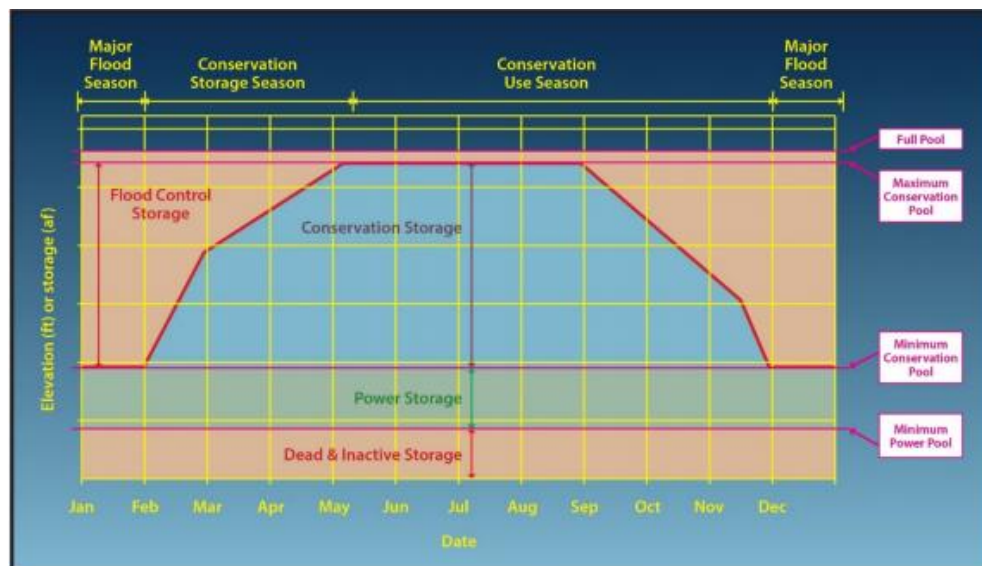
Id. at 239.

The Division Engineer provided that, “[i]n general, *this report does not outline the final plan of operation*, but rather the basic criteria for such a plan and the results which can be obtained from the system.” *Id.* at 324 (emphasis added). The Division Engineer references the Portland District’s Report in Appendix J for a more detailed discussion of the Willamette River subbasin plan. *Id.* at 244.

The Portland District’s Report includes an analysis of data applicable to the Willamette subbasin, proposed projects that were considered, and various special studies regarding precipitation, meteorology, hydrology, hydropower, and the rule curves for reservoir regulation. Appendix J describes a system of reservoirs wherein space at each storage project would be allocated for flood storage, power storage (if the dam provided hydropower), and dead storage. *Id.* at 1787, 1921, 2039, 2040 (Detroit); 1757, 1908, 2039, 2040 (Lookout Point); 1763, 1911, 2039, 2040 (Cougar); 1752-53, 1907, 2039, 2040 (Hills Creek); 1780, 1918, 2039, 2040 (Green

Peter). The projected storage allocations for the hydropower projects discussed in the Portland District's Report are consistent with the allocations outlined in the Division Engineer's Report. *Id.* at 244.

The Portland District's Report provides that during the flood season (November 15 to February 1), reservoir storage space would be evacuated to allow for flood storage. *Id.* at 1816. Power storage is described as "that increment of storage which lies directly above dead storage [and directly below flood control storage], and which is reserved *exclusively* for power generation. This storage would be drawn out for power production only if all flood-control were evacuated and inflow to the reservoir were inadequate to maintain firm power output." *Id.* at 2239 (emphasis added). The following diagram illustrates a typical rule curve and storage allocation for the WVP dams that generate hydropower:



The exclusive power storage is considered necessary only "in the critical power production period, October through March" which is "when the flows in Columbia River are low." *Id.* at 2054, 2057. For the remainder of the year, "power production would be incidental to reservoir releases made in the interest of other conservation uses." *Id.* at 2057. During the power

production period, “releases and storage (within the confining limits of flood control) are determined by the power requirements,” and power storage “would be drawn out for power production only if all flood-control storage were evacuated and inflow to the reservoir were inadequate to maintain firm power output,” which was forecasted to “happen on the average in about 1 year out of 10.” *Id.* at 2058, 2239.

Power storage is intended “to insure that Willamette River plants would contribute, in all years, a maximum amount of continuous power to the Columbia River power system during the 6-month critical power production period on Columbia River.” *Id.* at 2239. The WVP power storage allocations are based on: (1) “the maximum amount of prime power that could have been generated at Willamette River plants during” the “1937 critical period, the worst of record on Columbia River,” and (2) “[t]he amount of storage that would be required to produce this same amount of 6-month prime power under the worst Willamette River flow conditions, which occurred in 1941.” *Id.* In other words, the power storage allocations represent the amount of impounded water that would be needed to produce enough hydropower to meet regional demand under a worst-case scenario in both the Willamette River and Columbia River. *Id.* at 2058 (noting the “rule curves were prepared for each power site to show the maximum amount of storage required on any date to assure production of prime power for the remainder of the power season”); *see also id.* at 1726 (“[G]enerating plants in the Willamette Basin[] could be operated . . . to supply a part of the peak power requirements of that load area and to supplement Columbia Basin power during the low flow season on Columbia River.”).

After the flood season, the storage space reserved for flood control would be filled and used for conservation releases during the “low-water season,” May 1 to November 15, for purposes such as navigation, irrigation, power, fish, municipal and industrial water supply,

pollution abatement, and recreation. *Id.* at 1817, 1831, 2053, 2058. “[T]he general plan of reservoir regulation was to obtain a maximum degree of flood protection and at the same time provide stored water for conservation uses during low-water seasons.” *Id.* at 2053.

The Portland District’s Report notes that the reservoir regulation study discussed in Appendix J was “based upon the best information presently available as to conservation requirements and reservoir regulation policy,” and that “the schedules and rule curves developed *should not be considered final if future development in the basin should alter the concept of any of the conservation requirements, or should research indicate that a change in reservoir regulation policy would be beneficial.*” *Id.* at 2064 (emphasis added). The District’s Report specifically noted that “[a]dditional investigations and studies are required in order satisfactorily to solve the problem of maintaining fish life within Willamette River Basin,” and that “[m]any problems are so complex that additional studies will have to be made to in order to find satisfactory solutions.” *Id.* at 2284.

B. Analysis

Plaintiffs seek an injunction requiring the Corps to conduct deep drawdowns between November 15 and December 15 at Cougar and Lookout Point reservoirs. Due to the amount of time it takes to draft and refill the reservoirs, the drawdowns would eliminate the ability to generate hydropower during the six-month power production period for approximately six weeks at Cougar Dam and approximately ten weeks at Lookout Point Dam. Wells Decl. ¶¶ 60, 83, ECF 69. Plaintiffs argue the 1950 FCA and HD 531 imposes broad goals on the Corps and gives the agency discretion to modify WVP operations based on changed circumstances.

The crux of the Corps’ position is that the 1950 FCA grants it some discretion to dip into the power pool to meet downstream flow requirements for the listed salmonids, but it does not

have the authority to conduct deep drawdowns that would preclude hydropower generation during the power production period. The 2008 BiOp's RPA Measure 4.8 required the Corps to conduct downstream fish passage measures until it completed the permanent passage structures called for by the BiOp. Consistent with RPA 4.8, the Corps conducted a deep drawdown at Cougar Reservoir in 2012 and began planning to conduct a drawdown at Lookout Point Reservoir, but then decided in March 2018 that it did not have the authority to do so under the 1950 FCA. In support of its about-face on the authority issue, the Corps submits a November 2020 opinion drafted by its legal department, and adopted by the Corps, explaining its lack of authority under the 1950 FCA. Corps' Legal Opinion, ECF 131-1.⁴

The Corps' Legal Opinion concludes that deep drawdowns are a type of project modification that the Chief of Engineers must obtain congressional approval of before conducting. In *Env't Def. Fund, Inc. v. Alexander* ("EDF"), the district court held that the Corps had the authority to make several construction modifications to a water development project that significantly deviated from the plan of improvement contained in the authorizing legislation and associated Corps' reports. 467 F. Supp. 885 (N.D. Miss. 1979), *aff'd*, 614 F.2d 474 (5th Cir. 1980). In determining the limits of the Corps' authority to make "such modifications as in the

⁴ The Corps argues its legal opinion is entitled to deference and cites a case where *Chevron* deference was applied to uphold an agency's interpretation of the Fair Labor Standards Act, *Long Island Care at Home, Ltd. v. Coke*, 551 U.S. 158, 165 (2007). However, the Corps' Legal Opinion was not subject to notice-and-comment procedures and is therefore not entitled to *Chevron* deference. *Christensen v. Harris Cty.*, 529 U.S. 576, 587 (2000). At most, the Corps' opinion is entitled to non-binding *Skidmore* deference, *id.*, and more likely deserves no deference at all, *Christopher v. SmithKline Beecham Corp.*, 567 U.S. 142, 155 (2012) (no deference owed where agency's interpretation advanced in a legal brief is a "nothing more than a convenient litigating position" or a "*post hoc* rationalization . . . to defend past agency action against attack.") (internal citations and quotation marks omitted); *see also* Corps' Legal Opinion 1 (noting the opinion was drafted "[a]s a result of [ESA] consultations and associated litigation"). Even assuming *Skidmore* deference applies, the Corps' Legal Opinion is not persuasive for the reasons explained herein.

discretion of the Secretary of War (Army) may be advisable,” the district court looked to the Corps’ “general principles” for determining when a project modification exceeded its discretion and needed congressional authorization. *Id.* at 900-01, 908-09.

Under those principles, the Corps would seek congressional approval where a modification would materially change the scope of the project (i.e., the territorial area to be served), the purpose or function of the project (i.e., navigation, flood control, etc.), or the plan of improvement as originally authorized by Congress. *Id.* at 909. The Corps would not, however, seek approval for construction modifications that were: (1) necessary for engineering reasons to produce the degree or extent of navigation improvement intended by Congress, such as the shifting of a dam to a nearby, better location; or (2) moderate extensions of project scope to account for developments occurring after the project was authorized and avoid the construction of obsolete projects. *Id.*

The Corps contends that deep drawdowns constitute a material change to the purpose and function of the WVP and, therefore, cannot be implemented absent congressional authorization. The *EDF* court, however, deferred to the Corps’ “general principles” for seeking congressional authorization because the act authorizing the project “contained no extraordinary or unusual language which would vary the authority of the Corps officials to make changes in design over and beyond the [Corps’ ‘general principles’] without seeking additional authorization from Congress.” *Id.* Here, the Court need not defer to these “general principles” because HD 531 contains much more than a general grant of discretionary authority and expressly provides that “the schedules and rule curves developed should not be considered final if future development in the basin should alter the concept of any of the conservation requirements, or should research indicate that a change in reservoir regulation policy would be beneficial.” HD 531 at 2064. Not

only is the Corps' authority to adjust WVP operations under the 1950 FCA much broader than it was in *EDF*, but HD 531 also contemplates prioritizing the needs of the salmonids over power production when necessary. *Id.* at 2058 (providing an "exception" to the power storage requirement and detailing that the Corps should use power storage to support fish life "when a shortage of water existed" because "under this condition . . . fish life . . . would have priority over power"). Thus, the Corps' "general principles" are irrelevant here.

In *Britt v. U.S. Army Corps of Eng'rs*, the Second Circuit held that the Corps had lawfully approved a new location for a bridge even though it would be built one-and-one-half miles south from the location approved by Congress. 769 F.2d 84, 90 (2d Cir. 1985). Like here, Congress enacted legislation authorizing the Corps to build a project "in accordance with the plans" outlined in a preliminary report contained in a House Document, which in turn recommended the project be built "with such modifications thereof as in the discretion of the Chief of Engineers may be advisable." *Id.* at 88-89 (emphasis omitted). The court found that language alone indicated that "Congress gave the Chief of Engineers considerable discretion to approve modifications of the project." *Id.* at 89. The Second Circuit explained:

Particularly in a situation such as is presented here, where more than twenty-five years have elapsed between the Congressional authorization and the actual implementation of the project, it would be unreasonable to impute to Congress the intent to preclude the Chief of Engineers from making reasonable modifications in the project to accommodate intervening developments in the economic, social, ecological, or political climate. . . . [M]odifications by the Chief of Engineers in a project such as this are within the scope of his authority unless they are so foreign to the original purpose of the project as to be arbitrary and capricious.

Id. The court concluded that changing the location of the bridge was within the Corps' authority because it "appears generally to serve the purpose of facilitating automobile traffic across the northern end of the Bay" and, therefore, did "not appear to be foreign to the original purpose of the project." *Id.* at 90.

Similarly, in *United States v. 2,606.84 Acres of Land in Tarrant County, Texas*, the Fifth Circuit determined that the Corps acted within its authority when it built a dam that was significantly larger, more expensive, and approximately three miles away from the location authorized by Congress. 432 F.2d 1286, 1293 (5th Cir. 1970), *cert denied*, 402 U.S. 916 (1971). In reversing the lower court, the Fifth Circuit found that “[t]he source of the trial court’s misconception [that the dam exceeded congressional authority] is found in the finality and binding effect which it gave H.D. 403.” *Id.* at 1292. The court determined that Congress could not have intended HD 403 to be the final plan for the project because the “cover letter of the document itself states that it is a ‘preliminary examination and survey’” and the Chief of Engineers recommended the project be carried out “‘generally in accordance’ with the plans contained in the report ‘as modified herein, and with such future modifications thereof as in the discretion of the Secretary of War and the Chief of Engineers may be advisable.’” *Id.* The Fifth Circuit concluded that the Corps was authorized to deviate from the plans in HD 403: “It is undisputed that the Congressional authorization was for a flood control project on the Clear Fork of the Trinity River. This is what the Corps of Engineers built. The area served and the project purposes were not changed.” *Id.* at 1293.

And in a more analogous case involving operational modifications, as opposed to construction modifications, the Eighth Circuit held that, under the 1944 FCA, the Corps had authority to make operational changes during drought years that reduced or eliminated navigation on the river to hold water in reservoirs for the benefit of recreation. *In re Operation of Missouri River Sys. Litig.*, 421 F.3d 618, 629 (8th Cir. 2005). Under the 1944 FCA, navigation and flood control are the “dominant” purposes of the Missouri River project, whereas irrigation, recreation, and fish and wildlife are “secondary” purposes. *Id.* The 1944 FCA did “not set forth

what level of river flow or length of navigation season is required to make navigation ‘dominant’ over a ‘secondary’ interest such as recreation.” *Id.* The Eighth Circuit upheld the Corps’ drought contingency plan because the Corps had considered all of the competing purposes before making its decision. *Id.* The court cautioned, however, that “[i]f, due to extreme conditions, the Corps is faced in the future with the unhappy choice of abandoning flood control or navigation on the one hand or recreation, fish and wildlife on the other, the priorities established by the FCA would forbid the abandonment of flood control or navigation.” *Id.* at n.7. Nonetheless, the Eighth Circuit held that, even though the drought contingency plan required shortening, and even eliminating, the navigation season in some years, the plan did not “abandon” navigation. *Id.*

Here, the Corps argues that Plaintiffs’ proposed drawdowns would “completely eliminate” the purpose of the exclusive power storage during the critical power production period and, thus, are “‘so foreign to the original purpose of the project’ that performing them would violate the 1950 FCA[.]” Def. Resp. 17 (quoting *Britt*, 769 F.2d at 89): *see also* Corps’ Legal Opinion 18-19 (“[T]he deep drawdowns at issue here would completely eliminate the reservoir storage that was specifically and exclusively reserved for the purpose of power production in a critical power production period in the comprehensive plan adopted by Congress.”). Problematically, the Corps’ argument treats the WVP’s power storage as a purpose in and of itself; however, the power storage is simply a means of effectuating a purpose—preventing regional power shortages in the winter when flows are lower in the Columbia River. The Corps has not put forth any argument nor submitted any evidence indicating that the drawdowns would lead to an abandonment of this purpose. Contrary to the Corps’ position, the drawdowns will not eliminate hydropower production during the entire power production period. Nor will the drawdowns at Cougar and Lookout Point reservoirs preclude power generation at

the other hydropower dams in the WVP—Hills Creek, Green Peter, and Detroit (to the extent Detroit’s turbines are operated during the day under the interim drawdown measure).⁵ The drawdowns do not constitute an abandonment of the power storage purpose in the same way that the Corps’ drought contingency plan in *Missouri River* did not amount to an abandonment of that project’s “dominant” navigation purpose.

Although HD 531 specifies that WVP power storage is “reserved exclusively for power generation” and *Missouri River* found the 1944 FCA’s lack of specifics regarding the necessary flows and length of the “dominant” navigation season established that the Corps had discretion to adjust its operations on the Missouri River, the WVP plan Congress approved in the 1950 FCA is

⁵ The Portland District’s Report detailed that, due to the interconnectedness of the Pacific Northwest power transmission system, power production “at individual [WVP] plants in all years would not be essential.” HD 531 at 2240. The reservoir regulation study found that “[d]uring the periods when firm power could not have been produced in Willamette Valley, Columbia River flows were sufficiently high to enable other Columbia River system plants to make up the deficiency, and the system firm power would have been maintained.” *Id.* at 2062. The comprehensive plan noted that “[f]urther development of storage in Columbia River Basin within the United States, as contemplated in present power studies in this report, would increase the minimum dependable flow [during the critical power production months from 75,000 second-feet] to approximately 125,000 second-feet. This increased flow would result from the regulation of storage *primarily in the interest of system power production.*” *Id.* at 2573 (App. L) (emphasis added). HD 531 also noted, but did not include in its plan of development, that future projects on the Canadian portion of the Upper Columbia River would increase the ability to provide even greater minimum dependable flows year-round in the Columbia River. *Id.* at 305. “The 1964 Columbia River Treaty between the United States and Canada provided for building four storage reservoirs: three in Canada (Mica, Kennleyside, and Duncan) and one in the United States (Libby). The reservoirs that were built and operated under the Treaty represent almost half the water storage on the Columbia River System.” *Nw. Env’t Def. Ctr. v. Bonneville Power Admin.*, 117 F.3d 1520, 1525 (9th Cir. 1997). Currently, the WVP contributes less than 4% of the federally generated power in the Pacific Northwest. Connolly Decl. ¶¶ 18-19, ECF 66. Thus, the low winter flows in the Columbia River, and accompanying limits on power generation capability that the WVP’s power storage allocations were designed to guard against, have been alleviated by increased storage capacity in the Columbia River. The Court therefore finds that it is highly unlikely that the amount of WVP power storage specified in HD 531 is still needed to prevent regional power shortages caused by low winter flows on the Columbia River and, as noted, no such argument has been made here.

“not [to] be considered final . . . should research indicate that a change in reservoir regulation policy would be beneficial.” HD 531 at 2064, 2239; *see also id.* at 324 (“In general, this report does not outline the final plan of operation, but rather the basic criteria for such a plan and the results which can be obtained from the system.”). Like HD 403 in *2,606.84 Acres*, the WVP plan is preliminary in nature; the “cover letter of [HD 531] itself states that it is a ‘preliminary examination and survey’” and the Chief of Engineers recommended the project be carried out “generally in accordance with the plans outlined in the report” and “with such modification as the Chief of Engineers may find advisable.” *2,606.84 Acres*, 432 F.2d at 1292; HD 531 at 5. “It has long been the custom of Congress to approve projects of this nature on the basis of such preliminary plans and to authorize the Chief of Engineers to make such modifications as later studies indicate are necessary.” *Britt*, 769 F.2d at 89 (quoting *2,606.84 Acres*, 432 F.2d at 1292). Given the highly imperiled status of the listed salmonids, the deep drawdown measures constitute such necessary modifications.

Indeed, HD 531 itself makes clear that its plans are just a “general guide” for management of the dams in the Columbia and Willamette basins, which could be adjusted later as conditions changed or more information about the dams’ effects became known—expressly including impacts to fish. HD 531 at 16, 21, 253, 324, 334, 342, 2284, 2885, 2924 (noting “the safe downstream passage of migrating fingerlings at dams” required further study and solutions). The Board Report specifically noted that the comprehensive plan was “sufficiently flexible to permit equitable adjustments as the execution of the plan proceeds.” *Id.* at 20. Notwithstanding the Corps’ assertion that its hands are tied, the “report does not outline the final plan of operation, but rather the basic criteria for such a plan and the results which can be obtained from the system.” *Id.* at 324.

Furthermore, many of HD 531’s fish-related assumptions have proven untrue over time. For example, the Portland District’s Report found that during the critical power period, hydropower generation could be prioritized because “[f]ish requirements are always less than power requirements during this period.” *Id.* at 2239.⁶ The Corps even hypothesized that the dams’ regulation of flows “would greatly improve conditions on the main streams below the reservoirs and would aid fish migration materially.” *Id.* at 1866. Subsequent studies and the 2008 BiOp’s findings demonstrate, however, that the Corps’ operation of the WVP is materially impeding fish migration. As the Second and Fifth Circuits have observed, “[i]t imparts both stupidity and impracticality to Congress to conclude that the [authorizing] statute impliedly forbids any change in a project once approved, and thus prevents the agency official from providing for the unforeseen or the unforeseeable.” *Britt*, 769 F.2d at 89 (quoting *Creppel v. U.S. Army Corps of Eng’rs*, 670 F.2d 564, 572 (5th Cir. 1982)) (brackets original).

In sum, the 1950 FCA and HD 531 are intended to serve as a general guide for operating the WVP, provide an “exception” to the power storage requirement when there is insufficient water to support fish life, expressly recognize that further studies were needed to find solutions for the dams’ impacts on salmonids, provide that the rule curves should not be considered final if further research indicated changed operations were needed, and grant broad discretion to the Chief of Engineers to make operational modifications he or she finds advisable. Because the deep drawdowns Plaintiff seek do not appear to be foreign to the original purpose of the project, are “substantially in accordance with the plans recommended in” HD 531, and do not equate to an abandonment of the purpose of the WVP’s power storage, the Court will order this relief.

⁶ The Fish and Wildlife Coordination Act of 1958, 16 U.S.C. §§ 661-664, and the Pacific Northwest Electric Power Planning and Conservation Act of 1980, 16 U.S.C. §§ 839-839h, placed fish and wildlife on equal footing with power production.

IV. Narrowly Tailored

If a court determines that injunctive relief is warranted, such relief must be tailored to remedy the specific harm. *Melendres*, 784 F.3d at 1265. With the exception of the proposed injunction measures discussed below, the Court finds Plaintiffs’ requested remedies are narrowly tailored to remedy the irreparable harm in this case.

A. Technical Advisory Team

Plaintiffs request an injunction delegating oversight authority and adaptive management of the injunction actions to a Technical Advisory Team (“TAT”). Plaintiffs seek an order requiring the Corps to follow the TAT’s direction unless doing so would be infeasible or present a dam or human safety issue. For the TAT to work as Plaintiffs envision, however, the Court would have to delegate its Article III injunction powers to the TAT. The Constitution prohibits this abdication of judicial authority. *Armstrong v. Brown*, 768 F.3d 975, 987-88 (9th Cir. 2014) (a court may not delegate its Article III powers to an expert advisor but may retain an expert to monitor compliance and make recommendations to the court); *Burlington N.R.R. Co. v. Dep’t of Revenue of State of Wash.*, 934 F.2d 1064, 1072 (9th Cir. 1991).

Although the Corps often ignores the recommendations of the expert agencies and improperly prioritizes other project purposes over the needs of the listed salmonids, the Court has no basis to believe that the Corps will not follow the Court’s orders. At this juncture, the Court declines to order expert oversight of the Corps’ implementation of the interim measures because more narrowly tailored options, i.e., implementation plans created by an expert panel and biannual status reports, are available to ensure the Corps complies with the mandates of the ESA and the Court’s injunction during the reconsultation period.

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B. Oregon Water Quality Standards

The Court will not order the Corps to exceed Oregon's standards for TDG levels in violation of the Clean Water Act. Although there is some evidence that brief periods of elevated TDG levels up to 120-125% have a negligible effect on fish, *NWF VII*, 2017 WL 1829588 at *7, a court may not command an agency to violate its other statutory obligations. *San Luis*, 747 F.3d at 645 n.49. Nor will the Court order the Corps to seek a rule change allowing temporary TDG exceedances. The State of Oregon does not believe it necessary to change its water quality standards, and this Court will not order a futile act. Amicus Reply Br. 4, ECF 140.

C. Unrelated Studies and General Research

The Court declines to grant Plaintiffs' request for a December 2021 deadline for the Corps to complete the Cougar 2.0 Study, request for the Corps to fund and implement general research needed for the new biological opinion, and request for the Corps to update the 2012 OMET Report. The Cougar 2.0 Study and Defendants' record development during reinitiated consultation are separate processes that are properly left to the agencies' discretion. The sufficiency of the 2012 OMET Report was never challenged in this action. Accordingly, those requests are not narrowly tailored to remedy the specific harms at issue in this case.

V. Expert Panel

It is abundantly clear that changes to the Corps' operation of the WVP are necessary to avoid irreparable harm. It is also clear that such operational modifications necessitate consideration of biological tradeoffs, involve many complex and sometimes imprecise variables, require adaptive management in their implementation, and must be monitored to measure their efficacy. Less clear is how some of the injunction measures can be implemented in a comprehensive manner that balances the potential tradeoffs, accounts for the multifarious

variables, and provides the most benefit to the listed salmonids. Thus far, the Court has been forced to glean NMFS' expertise from the administrative record, as not one declaration from a NMFS fish biologist has been submitted in this case. The Corps makes much-to-do about developing its interim measures in coordination with NMFS; however, the measures were created under the incorrect assumption that the Corps lacks statutory authority to conduct deep drawdowns or other operational measures that reduce hydropower generation during the power production period. Therefore, the Court finds it appropriate to fashion an Expert Panel, in which the parties' technical experts will confer and flesh out the implementation details of numerous interim mitigation measures.

As detailed in the accompanying Interim Injunction, the Court is ordering Defendants to carry out specific interim measures that the Court finds do not require further clarification, as well as other measures that are biologically necessary but involve technical aspects requiring further input from the parties' experts. The Expert Panel "will be limited to eight members comprised of two of Plaintiffs' fish experts, two NMFS' fish experts, two Corps' dam-operations experts, and two 'ad hoc' federal experts, such as the US Fish & Wildlife Service ('USFWS') or US Geological Survey ('USGS'), where necessary to advise on matters within their respective areas of expertise." Minute Order, ECF 196. The experts' deliberations will not devolve into a forum for further disagreement about the biological benefits of, or the Corps' authority to carry out, the interim measures. The Court has already determined that the Corps has discretionary authority and must provide volitional downstream fish passage and water quality measures to mitigate irreparable harm to the listed salmonids. Those issues are therefore beyond debate and need not be taken into consideration during the expert panels' deliberations. Simply put, the

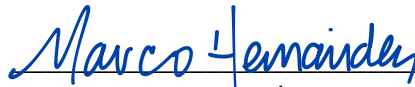
Expert Panel's task is to hammer out the details and propose implementation plans⁷ containing the best means for effectuating the ends the Court has determined equity demands.

CONCLUSION

For the reasons discussed, the Court GRANTS in part and DENIES in part Plaintiffs' Motion for Injunctive Relief [117].

IT IS SO ORDERED.

DATED: September 1, 2021.


MARCO A. HERNÁNDEZ
United States District Judge

⁷ Due to the short timeframe provided for conducting the Cougar deep drawdown and Foster spill operation (Injunction Measures 13 & 14), the Court directed the Expert Panel to submit implementation plans for those measures prior to issuing this Opinion & Order. Plaintiffs' experts agree with the Expert Panel's implementation plan for the 2021 Cougar drawdown but request an order directing the Corps to conduct a more robust PIT-tag study of the operation. Defendants also support a PIT-tag study; however, they note that there is simply not enough time to put such a study in place this year due to fiscal laws and regulations. Instead, Defendants propose operating rotary screw traps below Cougar Dam and, if available by mid-October, using marked juvenile spring Chinook to assess passage efficiency. Defendants also note that they will conduct a PIT-tag study beginning next year. Given the short deadline for carrying out the Cougar drawdown and Defendants' assurances that they will implement more robust RM&E in future years, the Court accepts the Cougar drawdown implementation plan as proposed.

INTERIM INJUNCTION

For the reasons discussed, Plaintiffs have demonstrated they are entitled to injunctive relief. Accordingly, the Court ORDERS as follows:

- (1) Defendants SHALL complete reinitiated ESA-consultation and issue a new biological opinion by December 31, 2024.
- (2) The Expert Panel SHALL confer and, no later than the deadlines set herein, submit implementation plans fleshing out the parameters of the measures discussed in this Interim Injunction. The Expert Panel's proposed measures must be in accordance with the best available science, technically feasible, incorporate principles of adaptive management, and provide meaningful research, monitoring, and evaluation ("RM&E") of the interim measures.
- (3) Until Defendants issue a new biological opinion, the Corps SHALL implement the interim injunction measures to the greatest extent practicable under existing hydrologic conditions and necessary flood control operations. In carrying out the interim measures, the Corps must make every effort to comply with the various water quality standards governing the WVP.¹
- (4) The Corps SHALL fund and/or carry out RM&E to evaluate the effects of the interim measures on UWR Chinook salmon and UWR steelhead. The Expert Panel will propose specific RM&E to accompany the interim measures in the implementation plan submissions.

¹Should Plaintiffs believe the Corps is not operating consistently with the implementation plans, the parties SHALL meet and confer and make reasonable efforts to resolve the dispute. If the parties are unable to resolve their dispute, Plaintiffs may file a motion with the Court to clarify the Corps' obligations under or address the Corps' compliance with the Implementation Plan.

- (5) The Corps SHALL follow its established maintenance outage schedules and emergency protocols.
- (6) Beginning February 28, 2022, Defendants SHALL provide status reports every six months detailing their progress and compliance with the interim measures. The biannual status reports must include the following information: (1) the interim measures that have occurred at each dam; (2) any deviation from outage schedules, emergency protocols, and water quality standards; (3) all RM&E that was conducted during the prior six months and any available results of that research; (4) all RM&E planned for the next six months; and (5) any proposed changes to the interim measures based on changed circumstances or the results of RM&E.
- (7) Defendants SHALL post the results of all RM&E on a publicly accessible website.
- (8) Given the Corps' track record of not following through on past interim measures and repeatedly missing self-imposed deadlines, the Court finds it necessary to incorporate into this Interim Injunction the Corps' Interim Measures that sufficiently mitigate irreparable harm. *See* Interim Measures Implementation Plan, ECF 130-1; Refinements to Interim Measures, 178-2. The Court therefore ADOPTS by reference and ORDERS the Corps to implement Interim Measure Nos. 5, 6, 7, and 20.
- (9) "Deep drawdown" measures must: (1) be performed during peak juvenile migration timing; (2) prioritize volitional fish passage; (3) draw down the reservoir elevation to within 25' or less of the regulating outlets; and (4) prioritize use of the regulating outlets during the drawdown, especially during the hours between sunset and sunrise.

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North Santiam Subbasin

- (10) The Corps SHALL carry out fish passage and water quality operations at Detroit and Big Cliff reservoirs as detailed in the Corps' Interim Measure Nos. 5-7.
- (a) By September 8, 2021, the Expert Panel will make a recommendation to the Court on whether the interim operation should be modified to incorporate use of the lower regulating outlets at Detroit Dam for temperature control purposes.
- (b) By February 10, 2022, the Expert Panel must determine whether operational measures alone are sufficient to maintain acceptable TDG levels below Big Cliff Dam. If the Expert Panel determines a structural solution is needed, Defendants SHALL propose a reasonable timeline for designing and constructing a structural solution for mitigating excess TDG levels during spill operations. Defendants' proposed timeline for designing and constructing a structural solution for elevated TDG levels below Big Cliff Dam is due no later than August 5, 2022.

South Santiam Subbasin

- (11) Within one year of this Interim Injunction, the Corps SHALL begin outplanting adult UWR Chinook salmon above Green Peter Dam.
- (a) By November 5, 2021, the Expert Panel will submit an outplanting plan, including any improvements and/or development of adult release sites necessary to accomplish adult outplanting above Green Peter Dam.
- (12) After adult outplanting above Green Peter Dam begins, the Corps SHALL carry out juvenile downstream passage measures at Green Peter Dam.

- (a) By November 5, 2021, the Expert Panel will submit an implementation plan for a spring fish-passage operation at Green Peter Dam that prioritizes volitional fish passage through non-turbine routes.
 - (b) By March 15, 2022, the Expert Panel will submit an implementation plan for a fall fish-passage operation at Green Peter Dam that prioritizes volitional fish passage through non-turbine routes.
- (13) Beginning fall 2021, the Corps SHALL carry out fall and spring fish-passage operations at Foster Dam.
 - (a) The Corps SHALL carry out the Foster fall spill operation specified in the Expert Panel's implementation plan included as Attachment 1 to this Interim Injunction.
 - (b) By October 15, 2021, the Expert Panel will submit an implementation plan for a spring spill or delayed refill fish-passage operation at Foster Dam that prioritizes volitional fish passage through non-turbine routes.

McKenzie Subbasin

- (14) Beginning fall 2021, the Corps SHALL conduct the Cougar Dam deep drawdown measure specified in the Expert Panel's proposed implementation plan included as Attachment 2 to this Interim Injunction.
- (15) Beginning in 2022, the Corps SHALL conduct spring passage measures at Cougar Dam.
 - (a) By October 15, 2021, the Expert Panel will submit an implementation plan for spring fish-passage operations at Cougar Dam, including delayed refill measures, that prioritize volitional downstream fish passage through non-turbine routes.

- (b) By March 15, 2022, the Expert Panel must determine whether structural improvements/modifications need to be made to Cougar Dam's regulating outlets to ensure safer fish passage and reduce TDG levels.

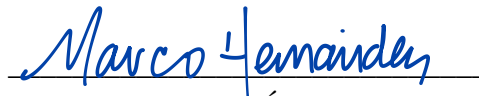
Middle Fork Willamette Subbasin

- (16) In coordination with the Expert Panel, the Corps SHALL conduct an analysis to determine the degree of landslide risk associated with implementing a fall deep drawdown at Lookout Point Reservoir. The deep drawdown(s) studied in the analysis must prioritize volitional fish passage through Lookout Point Dam using non-turbine routes and must include any corresponding operational changes required to provide fish passage at Dexter Dam. The Corps' risk-analysis and recommendation on the deep drawdown operation at Lookout Point Dam is due by January 31, 2022.
- (17) Beginning 2022, the Corps SHALL conduct spring spill operations at Lookout Point Dam and Dexter Dam.
 - (a) By December 8, 2021, the Expert Panel will submit an implementation plan for a Lookout Point/Dexter spring spill operation specifying what elevation at Lookout Point Reservoir the Corps will begin spill operations to provide the most benefit to the salmonids. The implementation plan must prioritize use of the spillway to the maximum extent practicable and turbine use should be limited to only the amount necessary to manage water temperatures and TDG levels. The Expert Panel must also determine whether, in addition to the Corps' plan of splitting water between the spillway and powerhouse detailed in Interim Measure No. 21 (ECF 178-2), Lookout Point Dam's regulating outlets should also be utilized for temperature control in the late summer and early fall.

- (18) As required by RPA 4.6, the Corps SHALL make improvements to and begin operating the Dexter adult fish facility within two years of this Interim Injunction.
- (19) Beginning in 2021, the Corps SHALL conduct the annual Fall Creek Reservoir deep drawdown operation similar to prior years but extend the dates from December 1 through January 15. The Corps must monitor for erosion to the earthen embankment that could occasion the extended drawdown measure and may suspend the measure for dam safety reasons. The Corps must notify the Court within three days of the suspension.
- (20) Beginning in 2022, the Corps SHALL conduct winter and spring downstream passage operations at Fall Creek Dam.
 - (a) By October 15, 2021, the Expert Panel will submit implementation plans for winter and spring fish-passage operations that prioritize volitional passage over trap-and-haul operations if hydrologic conditions allow and downstream water quality requirements can be met.

IT IS SO ORDERED.

DATED: September 1, 2021.


MARCO A. HERNÁNDEZ
United States District Judge

ATTACHMENT

1

Foster Dam Fall Spill Injunction Measure
2021-08-20

Description/Intent

On July 14, 2021, the U.S. District Court for the District of Oregon issued a draft Interim Injunction Order that, once finalized, will direct the Corps to implement specified operations intended to improve conditions for fish passage and water quality in the Willamette Valley Project (WVP) to avoid irreparable harm to Endangered Species Act (ESA) - listed salmonids during the interim period until the completion of the reinitiated ESA consultation. These measures must be carried out “to the greatest extent practicable under existing hydrologic conditions and necessary flood control operations” while making “every effort to comply with the various water temperature, Total Dissolved Gas (TDG) and instream flow requirements governing WVP.”

The Draft Order requires the Corps will conduct/prioritize spillway operations at Foster Dam during the fall for juvenile fish passage, beginning in the fall of 2021.

The Court assigned an Expert Panel comprised of two of Plaintiffs’ experts, two NMFS biologists, two Corps employees, and two “ad hoc” Federal experts to define the details of this and other measures. The Expert Panel Assignment for the Foster spill operation is to “Consider and propose measures specifying the dates, hours, and amount of turbine use for the Foster spill operations that will provide the most benefit to the listed salmonids as a whole.”

The Expert Panel has considered multiple factors in developing this implementation plan.

- First, what is/are the biological objective(s) or goal(s) being sought and how can these objectives best be achieved?
- Second, what are the constraints or factors that need to be considered?
- And third, what additional information should be considered when shaping the operation?

Biological Goal

The goal of this spill operation measure is to provide improved downstream fish passage and survival for juvenile spring Chinook salmon and steelhead through Foster Reservoir and past Foster Dam. Through biological studies (or Research, Monitoring and Evaluation, RM&E) over the last several years, regional biologists have learned that fish tend to:

- exit Foster Reservoir mostly at night;
- pass in higher numbers via the spillway compared to the turbines; and
- survive at greater numbers when passed through the spillway than through the powerhouse and turbines.

Several years of RM&E of downstream fish passage timing and distribution indicate 96-98% Chinook salmon and steelhead pass Foster Dam at night and very few fish pass during daylight hours (Hughes et al 2016, 2017; Liss et al 2020). Additionally, approximately 58% of fish pass the spillway compared to 20% passage through the turbines, and survival rates were higher at the spillway (68%) compared to the turbines (57%) (Hughes et al 2016, 2017; Liss et al 2020).

Research conducted from 2016 through 2017 to evaluate the influence of Foster operations (turbine and spill) on river environment and fish habitat downstream of the dam indicate TDG levels in the river were highest (exceeding 110%) during periods when the spillway was operated by itself (i.e., with no turbine operation) (Arntzen et al 2018). However, TDG levels decreased (less than 110%) during periods of spillway and turbine operations (turbines were operated at 200 cfs for Station Service only) (Arntzen et al 2018). The TDG levels, even when they exceeded 110% saturation for short durations, did not appear to affect adult and juvenile salmon in the river (Arntzen et al 2018).

The proposed timing of the fall spill operations are based on research conducted to evaluate downstream fish passage and downstream TDG levels at Foster Dam.

Fall Spill Operation dates: October 01 through December 15.

Total project outflow is dependent on project storage and water availability. At this time, it is unknown whether there will be adequate stored water to meet spawning flow targets of 1500 cfs, from September 01 – October 15. To date, the 2021 water year has been dry and is considered a deficit year so project storage is unseasonably low for many Willamette Reservoirs, including Green Peter Reservoir, which helps to provide flow to the South Santiam River downstream of Foster Dam. If dry conditions persist this fall, adaptive management will be necessary and adjustments to total project outflows and this spill operation may be necessary. A balance between downstream river conditions and reservoir storage (i.e., the Green Peter power pool) is critical. Current forecasts indicate that an initial spawning flow of 1,100 cfs (from Sept 1 – 07), with a ramp up to 1300 cfs (after Sept 07). 1100 cfs would provide adult Chinook salmon access to most of the spawning gravel downstream of Foster Dam and would lessen the chance of de-watering redds during incubation. If funding and staffing allow, spawning survey(s) will be conducted from Foster to Pleasant Valley if flow is at or below 1,100 cfs.

Starting just after Labor Day weekend, Foster Reservoir will be gradually drawn down to target a forebay elevation of 620-625 ft. by October 01. Beginning on October 01, the following spill priorities will be followed:

- The Foster spillway will be operated from one hour before sunset to one-half hour after sunrise; turbine unit 1 (only) will be operated at station service (~300 cfs) to reduce/balance TDG levels created by the spill operation. Spill gates should be opened to a 1 ft. gate opening; outflow amounts will be dictated by reservoir

elevation (Table 1). Flows will be spread across multiple gates if necessary.¹ The fish ladder will continue to be operated.

- During the day, the Foster turbine units will be operated from one-half hour after sunrise to one hour before sunset, with full generation. The spillway will not be used to discharge water during this time unless required for flood risk management. The fish ladder will continue to be operated.

Table 1. Foster Dam Spillway Rating Table, 1 ft. Gate Opening.

Elevation, in ft. NGVD29	Flow at a 1ft. Gate Opening, in cfs
615	910
620	1020
625	1110
630	1210
635	1290
637	1320

The Corps' TDG model for Foster Dam predicts that spillway flows in excess of 3,000 cfs will generate TDG that exceeds the 110% water quality standard. This, and other water quality conditions will be monitored, and flows will be adjusted accordingly throughout this fish passage operation. The Corps will make every effort to comply with the State water quality standards.

Constraints and Considerations

This plan considers both the constraints that must not be violated, as well as other considerations such as current hydrologic conditions, etc. While implementing the fall spill operation at Foster Dam, the following constraints must be adhered to at all times:

- a. In general, spillway operations are known to produce TDG in exceedance of 110%. However, RM&E indicates operating turbine unit 1 at Station Service will reduce/balance TDG levels in the tailrace and downstream of Foster Dam during this fish passage operation. If higher outflows are required due to high inflow events, spill operations can be increased to as much as 3,000 cfs; higher spillway releases should be avoided to keep TDG levels downstream of Foster Dam below 110%.
- b. The spillway gates should not be operated at less than 1 foot open.

¹ Spreading spill across multiple gates reduces TDG generation. However, spillway passage survival tends to be highest at higher gate openings. These and other issues associated with spill operations were considered in developing this plan.

- c. The Corps' flood control mission is prioritized over all other actions and at no time will human health or safety be jeopardized during the implementation of this measure.

In addition to the constraints, the following considerations were used to develop the Foster Spill operations implementation plan:

- a. The BiOp minimum flow target for salmon and steelhead spawning and incubation downstream of Foster Dam is 1,100 cfs from October 16 to January 31.
- b. Fish passage through Foster Dam occurs at night with few, if any, fish passing during daylight hours.
- c. The Foster Adult Fish Facility is typically operated from February through November. The side entrance of the fishway (ladder) is adjacent to the spillway and spill could attract adult fish to the spillway instead of the ladder entrance. Additional flow to the ladder area may reduce this problem.
- d. Larger spillway gate openings provide safer passage and are more protective for fish.
- e. Use of Green Peter power pool storage to meet downstream flow benefits was coordinated through the Flow Management and Water Quality Team (FMWQT) when drought conditions were recognized early.

Implementation Plan

Taking the biological goal, RM&E conducted to date, constraints, and considerations described above into account, this implementation plan has been developed for the Foster Dam fall spill operations Injunction Measure, with the fall spill operation commencing on October 01, 2021. Note, the spill operation is tied to the hydrologic conditions of each year; that is, the total flow amount and timing (dates) of the start and end of the spill operations each season and year. These conditions could change depending on hydrologic conditions (water availability). What will not change from year to year is the overall goal of the operation and the constraints, which is to operate the spillway in the fall for downstream fish passage.

Potential Impacts and Mitigation

Spillway operations can create high TDG levels downstream of Foster Dam; that is TDG levels that violate the State water quality standard of 110%. Therefore, it is imperative to operate one turbine unit (Unit 1) at Station Service during spill operations to reduce/balance the TDG levels downstream of the dam.

Per Dam Safety requirements: Spill should be split evenly between two spill bays (e.g., bays 3 and 4) as long as a minimum gate opening of 1.0 foot can be obtained for each bay. If a 1-foot opening cannot be maintained using two bays, a single spill bay will be used, alternating daily between bays 2, 3, and 4. Spill bays 2-4 should be used for passing flows above 4,000 cfs through the spillway. All spill bays would be used for passing flows above 12,000 cfs.

Biological Monitoring

The following was developed to address the goal of the Draft Order to “provide meaningful research, monitoring, and evaluation (“RM&E”) of the interim measures”. RM&E for the fall 2021 spill operation was developed on a very short timeline and therefore may not be as robust as in a more developed plan. However, the objective of this RM&E is to learn as much as possible from the fall 2021 operations to inform not only this year’s operation, but outyear operations as well. In addition, because of the short timeframe to submit this plan, a more detailed RM&E plan will be prepared by the Expert Panel later this fall or early 2022 that would address the fall spill operations in 2022 and beyond. The plan may include RM&E for site-specific passage and survival and a plan for developing and implementing detection infrastructure for conducting studies using large release groups (e.g., detection at Foster and Lebanon dams). The plan may also include studies involving juvenile salmonids collected upstream of Foster Dam.

The metrics of interest include juvenile Chinook salmon and steelhead passage timing, forebay behavior and distribution, route distribution, passage rates and passage survival. The following outline the metrics that could possibly be evaluated during this fall spill operation. Active tag (radio telemetry) technology is recommended to evaluate these metrics because active tags will provide precise information on route distribution, passage rates, and survival. Additionally, active tag studies were conducted at Foster during 2015 through 2019 to evaluate spillway and turbine passage and survival rates and the results from those studies can be used to compare to the results of studies conducted to evaluate the fall spill injunction operation. However, long-term survival and studies such as paired-releases would require use of PIT tags because of large sample sizes required to obtain robust estimates. In addition, PIT tags can be used on small fish, either naturally produced juveniles (such as fish entering the reservoir) or surrogate fish that approximate the size of naturally produced fish. Appropriate methodology will be identified when a long-term RM&E strategy is developed as noted below.

Of note, it is not feasible to use screw traps in the tailrace of Foster Dam because the river environment is shallow. There is only one potential location for a screw trap in the tailrace, which is directly downstream of the powerhouse (turbine unit 1), close to the shore. Oregon Department of Fish and Wildlife operated a screw trap downstream of the turbine, close to shore, during 2015 and 2016 and determined the trap efficiency was very poor and removed the screw trap from operation (Romer et al 2016).

Due to the short timeline to implement the Foster fall spill measure and the lack of tag detection infrastructure, RM&E will be constrained in 2021, composed primarily of developing a fish-passage data collection system plan, and monitoring water quality and flow. The RM&E activities to evaluate the fall 2021 spill operation are as follows:

- A. If funding and staffing allow, spawning survey(s) will be conducted from Foster to Pleasant Valley if flow is at or below 1,100 cfs. These surveys will be conducted to

verify location of redds and depth of water over shallow redds. ODFW does not have funding or staff in place to conduct surveys in South Santiam.

- B. The Corps will initiate discussions by September 1 with the City of Albany (the owner of Lebanon Dam) regarding installing a new PIT-tag detection system at Lebanon Dam, to be installed as soon as possible.
- C. Surrogate fish (hatchery fish raised to mimic the size of fish likely to pass Foster Dam) will be needed to conduct studies requiring releases of large numbers of fish (e.g., outmigration and survival), not just for Foster studies but also for Green Peter passage studies. The Corps, or its designee, will collect eggs from returning Chinook adults during fall 2021, and have them raised to the sizes needed to conduct passage survival studies using surrogate fish in 2022.²

Hydropower Impacts

BPA expects hydropower impacts to be similar to past Foster Fall Spill operations.

Transmission Impacts

Assuming that operational changes for this operation only occur at Foster, then there should be minimal impacts to the transmission system.

At this time, it is unknown whether there will be adequate stored water to meet spawning flow targets of 1500 cfs, from September 01 – October 15. To date, the 2021 water year has been dry and is considered a deficit year, so project storage is unseasonably low for many Willamette Reservoirs, including Green Peter Reservoir, which helps to provide flow to the South Santiam River downstream of Foster Dam. If dry conditions persist this fall, adaptive management will be necessary and adjustments to total project outflows and this spill operation may be necessary. A balance between downstream river conditions and reservoir storage (i.e., the Green Peter power pool) is critical.

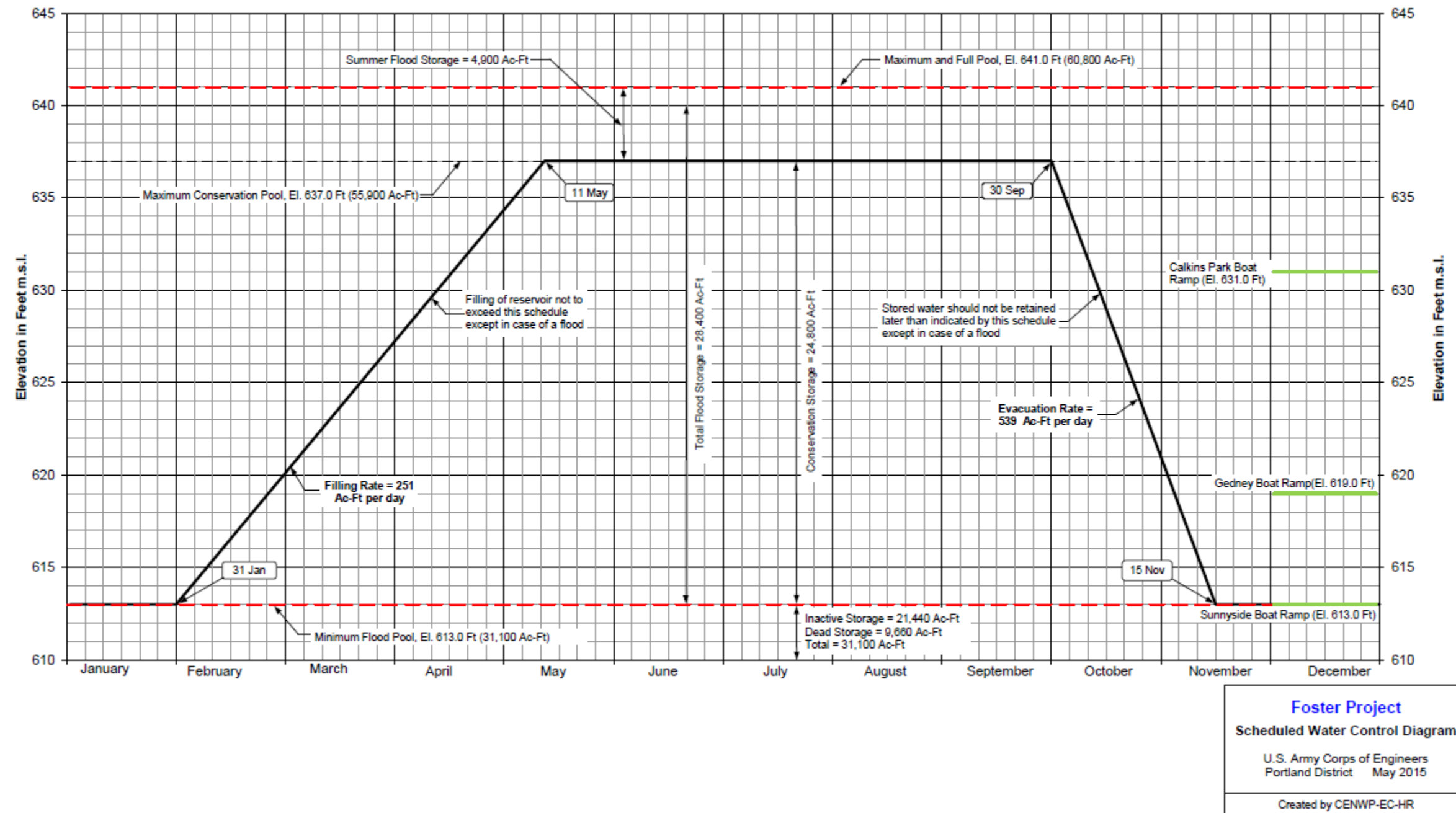
In the event that Green Peter Reservoir is drawn down below the minimum power pool elevation to meet flow targets in this dry year, and there is no generation at Green Peter, then there would likely be some impacts to the transmission system. BPA will need to be well informed of the timing and duration of any dip beneath the power pool at Green Peter to analyze the transmission impact.

Irrigation Impacts

Any action that substantially reduces summer storage or releases could affect irrigation water service contractors and water rights.

² Surrogate two-year old winter steelhead will not be available in 2023; eggs were not collected in 2021 due to low populations of returning adults.

Figure 1. Foster Reservoir Water Control Diagram



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ATTACHMENT

2

Cougar Dam Deep Drawdown Injunction Measure 2021-08-19

Description/Intent

On July 14, 2021, the U.S. District Court for the District of Oregon issued a draft Interim Injunction Order that, once finalized, will direct the Corps to implement specified operations intended to improve conditions for fish passage and water quality in the Willamette Valley Project (WVP) to avoid irreparable harm to Endangered Species Act (ESA) - listed salmonids during the interim period until the completion of the reinitiated ESA consultation. These measures must be carried out “to the greatest extent practicable under existing hydrologic conditions and necessary flood control operations” while making “every effort to comply with the various water temperature, TDG and instream flow requirements governing WVP.”

The Draft Order requires the Corps to conduct a deep drawdown of Cougar Dam beginning in the fall of 2021. The Court did not define the specific details of this operation but instead assigned an Expert Panel comprised of two of Plaintiffs’ experts, two NMFS biologists, two Corps employees, and two “ad hoc” Federal experts to define the details of this and other measures. The deep drawdown measure, as specified by the Court, must: (1) be performed during peak juvenile migration timing; (2) prioritize volitional fish passage; (3) draw down the reservoir elevation to within 25 ft. or less of the regulating outlets (ROs); (4) prioritize use of the ROs during the drawdown, especially during the hours between sunset and sunrise; and (5) where applicable, not preclude the ability to produce hydropower for the entire duration of the October through March critical power production period.

When developing and planning for the implementation of any operational change, multiple factors must be considered.

- First, what is/are the biological objective(s) or goal(s) being sought and how can these objectives best be achieved?
- Second, what are the constraints or factors that need to be considered?
- And third, what additional information should be considered when shaping the operation?

Biological Goal

The goal of this drawdown measure is to provide improved downstream fish passage and survival for juvenile spring Chinook salmon through Cougar Reservoir and past Cougar Dam. Through past biological study (or Research, Monitoring and Evaluation, RM&E), regional biologists have learned that fish tend to:

- exit Cougar Reservoir at night;
- pass in higher numbers when the reservoir is lower in elevation (and fish can more easily find an outlet through the dam);
- and survive at greater numbers when passed through non-turbine outlets.

The timing and target elevation of the Cougar Reservoir drawdown operation proposed below is designed to draw Cougar Reservoir down to elevation 1505 ft. by November 15, and as early as November 1, if possible without exceeding 800 cfs; and hold at this targeted elevation until December 15. On December 16, the Corps will use the RO during nighttime hours until el 1532 is reached. The Expert Panel will develop a spring passage implementation plan by October 15, 2021, which will provide direction for management of reservoir levels in winter 2022 and may address management in late December.

During drawdown from minimum conservation pool elevation (1532 ft.) to the targeted drawdown elevation of 1505 ft., the ROs will be prioritized to discharge water from the reservoir. The diversion tunnel will not be used during this special operation.

Constraints and Considerations

To meet the targeted elevation by November 1, the Corps needs an operations plan in place now. This plan should consider both the constraints that must not be violated, as well as other considerations such as current hydrologic conditions, etc. While implementing the drawdown of Cougar Dam the following constraints must be adhered to at all times:

- a. Regulating outlet (RO) outflows of greater than 800 cfs are known to produce total dissolved gas (TDG) in exceedance of 110%. This should be avoided unless actively fighting a flood.
- b. Normal drawdown and refill rates must be followed to protect embankments and the dam. This includes no greater than a 3ft/day drawdown or a 5ft/day refill rate.
- c. The RO gates should not be opened less than their minimum gate opening restriction, which is 1.25 ft.
- d. The Corps' flood control mission supersedes all other actions and at no time will human health or safety be jeopardized during the implementation of this measure.
- e. There is a natural "saddle dam" located in Cougar Dam. When the reservoir is drawn down below this feature, at elevation 1485 ft. NGVD29 the main reservoir is cut off from the cul-de-sac where the Cougar outlet structures exist. As such, Cougar Reservoir should not be drawn down below that elevation. This will impact the success of this operation and the ability to volitionally pass fish downstream.

In addition to the constraints, the following considerations were used to develop the Cougar Drawdown implementation plan:

- a. Total project discharge in excess of 700 cfs through October 15 should be avoided.
- b. Operating the ROs at elevations below 1495 ft. has some potential flow control issues (pressurizing and depressurizing the upstream portions). This type of flow condition is known to cause damage and should be avoided.
- c. The Water Temperature Control Tower (WTC) can be operated to a minimum elevation of 1571 ft. Once the reservoir drops below this elevation, water temperature management is no longer possible.

- d. The Cougar Adult Fish Facility is typically operated from mid-March through mid-October. The facility is dependent on turbine flows, so the timing of when flows are transitioned from the turbines to the ROs should be considered.
- e. Larger RO gate openings provide safer passage and are more protective for fish. This should be taken into consideration.
- f. There is some post-wildfire slope repair work above and around the regulating outlet outfall structure that is being planned for the fall. The schedule is to be determined. While this repair work isn't expected to conflict with the drawdown operation, this work should be coordinated accordingly.

Implementation Plan

Taking the constraints and considerations described above into account, the following implementation plan has been developed for the 2021 Cougar Drawdown Injunction Measure. Note that this drawdown plan is tied to the hydrologic conditions of 2021; next year's plan is likely to look different. In addition, because of the short timeframe to submit this plan, a more developed RM&E plan will be developed by the Expert Panel later this fall or early 2022 that would address the deep drawdown in fall 2022 and beyond. That RM&E plan would also include adaptive management guidelines. What will not change from year to year is the overall goal of the operation and the constraints. For this fall, Cougar project outflows will be managed from August through September to ensure healthy riverine conditions for downstream spawners.¹ Outflow will be increased incrementally in late August to a maximum of 700 cfs by early September in order to reach the target drawdown level as early as possible, and to prevent a large increase in flow (e.g., >800 cfs) that may increase TDG.

Once elevation 1571 ft. is reached², the ROs will be prioritized while balancing adult fish collection and downstream water quality. This outlet prioritization is based on past RM&E that indicates that fish begin exiting the reservoir in greater numbers once Cougar Reservoir is at or below elevation 1571 ft. (Table 1.). And, since it is generally accepted that survival is greater when fish are passed through the ROs (as compared to the turbines) at Cougar Dam, these outlets will be prioritized once elevation 1571 ft. is achieved. During daytime periods, turbines may be used to provide attraction flow for the adult fish facility.

¹ Proposed flows during drawdown are higher than the maximum spawning season flow set in the BiOp, but a large section of the South Fork McKenzie downstream of the dam has been restored to multiple channels, therefore the ecological conditions for spawning have been improved since the issuance of the BiOp. However, at higher flows redds could be made in areas of the river that may be susceptible to dewatering if flows need to be decreased for purposes of flood control. As discussed in the Biological Monitoring section below, the Corps, or its designee will conduct spawning surveys, in the South Fork McKenzie River downstream from the dam and will collect data on location of redds and depth of water over a subset of redds to provide a baseline for monitoring potential effects of flow decreases during incubation.

² Based on current forecasts, Cougar Reservoir is expected to drop below ele. 1571, concluding temperature control, sometime in the third week of September.

Table 1. Dam passage efficiency estimates, standard errors and lower and upper 95% confidence intervals by reservoir elevation from the study of acoustic-tagged juvenile Chinook salmon at Cougar Dam, Oregon in 2012.

[Sample size is the number of tagged fish in the denominator of the estimate, SE is standard error, LCI is lower 95% confidence interval, UCI is upper 95% confidence interval]

Study Period	Fish Origin	Elevation (ft)	Sample size	Est	SE	LCI	UCI
Spring	Hatchery	1690 to 1571	422	0.111	0.015	0.085	0.145
Fall	Hatchery	1690 to 1571	284	0.169	0.022	0.130	0.217
		<1571 to 1532	282	0.653	0.028	0.595	0.706
		<1532 to 1516	77	0.260	0.050	0.175	0.367
		<1516 to 1500	34	0.147	0.061	0.065	0.301
	Wild	1690 to 1571	8	0.000	0.000	0.000	0.000
		<1571 to 1532	43	0.651	0.073	0.502	0.776
		<1532 to 1516	7	0.286	0.171	0.082	0.641
		<1516 to 1500	4	0.000	0.000	0.000	0.000

Project outflows will begin to increase in late August and held throughout September and then increased to 800 cfs in mid-October so that the targeted elevation of 1505 ft. can be achieved by November 15, or earlier if possible without exceeding 800 cfs and TDG cap. Based on current forecasts, outflows will increase to 800 cfs starting on October 15; prioritization will be given to the ROs. Adjustments to this plan will be made in real time based on, among other things, current weather, hydrologic conditions, meeting target level early, keeping flow below 800 cfs to avoid excessive TDG, accommodating research downstream of the dam, and accommodating collection of adult salmon in the trap.

Once the reservoir is at, or below, minimum conservation pool (ele. 1532 ft.), and while the reservoir is held at 1505 ft., the ROs will be used exclusively to discharge water and provide fish passage. In the event of floods, poor water quality or emergency power needs³, the turbines may need to be utilized. Such conditions will be scheduled and managed in real-time and operational adaptations will be made as necessary to meet fish passage criteria and minimize electric imbalance where possible.

Varying inflows will cause reservoir elevations to fluctuate; and, while these fluctuations will be managed, it will not be possible to hold Cougar Reservoir at a flat elevation of 1505 ft. at all times. Some reservoir elevation fluctuations should be expected. Additionally, outflows from the dam will also fluctuate and should be expected. Efforts will be made to maintain el 1505 +/- 5 ft to minimize rapid changes in discharge, or discharges in excess of 800 cfs during the drawdown period, to the extent practical.

³ Cougar Dam has the ability to support the city of Blue River in the event of an emergency power need even if the reservoir is drawn down below minimum power pool (ele. 1516 ft.). Corps engineers have confirmed there are no structural concerns with generating below the minimum power pool.

On December 16, Cougar Reservoir will be allowed to refill, following the refill rates identified in the constraints section. After the reservoir reaches ele. 1516 ft., the Corps will use the ROs during nighttime hours until ele. 1532 is reached. The timing of the reservoir refilling above minimum power pool will be dependent on precipitation and is therefore highly variable but is generally expected sometime in January. The Expert Panel will develop a spring passage implementation plan by October 15, 2021, which will provide direction for management of reservoir levels in winter 2022 and may address management in late December.

Drawdown Plan Summary

In summary, the following operational plan is proposed:

1. Hold Cougar project outflows at or below 700 cfs through October 15.
2. Once ele. 1571 ft. is reached, prioritize releases through the ROs while balancing adult fish collection and downstream water quality needs. During daytime periods, some turbines flow may be needed to provide attraction to the adult fish facility.
3. Beginning on October 15, increase project outflows to 800 cfs and hold until the target elevation of 1505 ft. is achieved by November 15, or earlier if possible; prioritize the ROs. Note: additional outflow may be required depending on rain events and inflow conditions. Adaptive management will be applied as necessary.
4. Once the reservoir is at or below minimum conservation pool (ele. 1532 ft.) use the ROs exclusively to discharge water unless an emergency situation arises.
5. Hold Cougar Reservoir at elevation 1505 ft. from November 15 (or earlier if possible) to December 15, as best as possible. Use the ROs exclusively during this time unless an emergency situation arises.
6. Begin refilling Cougar Reservoir on December 16 (RO operations only). After the reservoir reaches ele. 1516 ft., the Corps will use the ROs during nighttime hours until ele. 1532 is reached.
7. Avoid dewatering established redds until fry emergence to the extent possible.⁴

Potential Impacts and Mitigation

RO spill can create high TDG levels downstream of Cougar Dam and should remain below 800 cfs unless necessary for flood control, since RO outflows greater than 800 cfs are known to generate TDG that violates the state water quality standard of 110%.

Risks to cultural resources from illegal looting during the deep drawdown will require both increased law enforcement/patrol efforts, increased signage, and education and outreach. Archaeological surveys/monitoring may also be needed to quantify negative impacts from

⁴ The end date of redd protection will be based on estimated emergence using accumulated degree-days since the median date of active spawning. The minimum flows should be protective of redds based on the United States' current understanding of the system.

erosion and sedimentation (may also require aerial imagery or LiDAR acquisition). Gates, rocks, or other barriers should be erected to restrict off road vehicle use in the exposed lakebed.

Adult bull trout will likely be present in the reservoir during this operation, and some may pass through the ROs while they are in operation. While not certain of the level of impact, USFWS biologist suspect there will be some individual level impacts that otherwise may not have been incurred had those adult fish remained in the reservoir.

Biological Monitoring ⁵

The following was developed to address the goal of the Draft Order to “provide meaningful research, monitoring, and evaluation (“RM&E”) of the interim measures.” RM&E for the fall 2021 drawdown was developed on a very short timeline and therefore may not be as robust as in a more developed plan. However, the objective of this RM&E is to learn as much as possible from the fall 2021 downstream fish passage operation to inform not only this year’s operation, but outyear operations as well. In addition, because of the short timeframe to submit this plan, a more detailed RM&E plan will be prepared by the Expert Panel later this fall or early 2022 that would address the deep drawdown in fall 2022 and beyond. That RM&E plan would also include adaptive management guidelines.

The metrics of interest include spring Chinook juvenile passage timing, size at passage, passage rates and passage survival.

The RM&E activities to evaluate the fall 2021 deep drawdown are as follows (additional detail and background information is provided below this section). The Corps will attempt to conduct the RM&E as outlined in this proposal in fall 2021, but there is uncertainty regarding the availability of fish, equipment, personnel and funding⁶ necessary to carry out such activities given the short time remaining before the RM&E would need to be implemented.

- A. The Corps, or its designee, will conduct spawning surveys, in the South Fork McKenzie River downstream from the dam and will collect data on location of redds and depth of water over a subset of redds to provide a baseline for monitoring potential effects of flow decreases during incubation.
- B. Operate rotary screw traps below the dam in the RO and turbine channels to capture, measure, and sample fish.
 1. Enumerate juvenile salmon caught in the trap.
 2. Conduct periodic trap efficiency tests for expanding the trap catch to estimate the number of salmon leaving the reservoir. Because trap catch may be low and because fish caught in the trap may be kept for holding mortality studies, juvenile hatchery

⁵ We dissent. Richard Domingue and Kirk Schroeder, the Plaintiffs’ representatives on the Expert Panel support implementation of all aspects of this plan, including the biological monitoring measures. However, we believe the biological monitoring measures are insufficient and submit our dissent at the end of this plan.

⁶ RM&E activities that were not already planned to occur in fall 2021 are subject to the Corps being able to reprogram or reallocate sufficient funding to carry out those activities in accordance with applicable fiscal laws and authorities prior to when the RM&E would need to be implemented this fall.

salmon may be used for the tests. Tests should be conducted at different flows. A minimum of two tests should be conducted for each major flow change (e.g. during the shift from 700 cfs to 800 cfs, then when flows return to minimum).

3. Measure (fork length) randomized sample of fish throughout outmigration period to provide length frequency of outmigrants. The purpose of this metric is to provide information about the life history of the juvenile salmon passing the dam.
- C. Collect information on condition and mortality of fish caught in rotary screw traps.
 1. Record condition of captured fish outmigrating from the reservoir including degree of de-scaling, injuries, degree of copepod infestation, etc.
 2. When fish are available, hold juvenile salmon caught in the trap every week to directly assess delayed mortality (aim for 30–50 fish per week); note that this direct measure of delayed mortality supplements assessments through tagging and downstream sampling. Fish for the test could be held at the Cougar adult collection facility and would be monitored and recorded for 24–48 hours.
- D. If available by mid-October, release marked juvenile spring Chinook fish into the reservoir to help assess fish passage efficiency. In future years, PIT tag or active-tag studies will be carried out and developed in coordination with the Expert Panel.
- E. Because survival and outmigration studies will likely require the use of surrogate fish to ensure adequate release numbers for statistical analysis, hatcheries should be directed to collect extra eggs in September 2021 to provide surrogate fish beginning in 2022. The Expert Panel will be developing additional implementation plans for other subbasins that may identify studies requiring surrogate fish. If eggs are not collected this fall, then studies requiring surrogate fish would have to be postponed until 2023 at the earliest.

Background and additional information

Conducting trap efficiency tests of the rotary screw trap operated downstream of the dam is important to be able to expand the number of salmon migrating past the trap site. Raw numbers of fish caught in the trap are of limited value without information about how effective the trap is during different flows. McKenzie Hatchery salmon can be used to conduct efficiency tests. At least two tests should be conducted during each major flow change during the drawdown period and during the full drawdown period. Fish should be uniquely marked to identify their recapture in the trap.

The Corps should attempt to collect 30–50 fish in various condition from the trap each week and hold them to determine immediate and short-term delayed mortality. It is important to include fish that appear to be not injured and in good condition as part of the sample because internal injuries may not be apparent, yet may result in mortality. Fish would be held at the adult collection facility at Cougar Dam and would be monitored for 24–48 hours. If facilities are available, salmon that appear to be not injured should be held separately to compare their mortality to those fish with various external injuries.

Water quality monitoring data will be used to provide guidelines for adaptive management through the deep drawdown and into the spring drawdown. Potential impacts to areas

downstream of Cougar Dam include increased water temperature that could alter incubation time of eggs in redds and TDG.

Surrogate fish (hatchery fish that are reared to approximate the size of naturally-reared fish) are an important tool for conducting studies that require large release numbers and controlled releases. In anticipation that surrogate fish will be needed for RM&E of court-ordered measures, eggs will need to be collected in September 2021 to ensure fish would be available in 2022 for studies. Therefore, NMFS and the Corps will coordinate with hatcheries to collect eggs and the Corps will provide funds needed to rear surrogate fish.

Table 2. Estimates of relative reach-specific survival probabilities of radio-tagged juvenile Chinook salmon passing through the regulating outlet at Cougar Dam, Oregon; November and December 2012.

[Results are based on the estimated survival of fish released at the temperature control tower (treatment group) divided by the estimated survival of fish released in the tailrace (control group) after adjustment for detection of euthanized fish with live transmitters]

Reach	Estimate	Standard error	95-percent confidence interval	
			lower	upper
----- November Study -----				
Temperature control tower to Leaburg Dam	0.4885	0.0497	0.3910	0.5860
Temperature control tower to Marshall Island ¹	0.4594	0.0543	0.3530	0.5659
Marshall Island to Hops Farm	0.7675	0.0821	0.6066	0.9284
----- December Study -----				
Temperature control tower to McKenzie River	0.6669	0.0496	0.5626	0.6807
McKenzie River to Leaburg Dam	0.9543	0.0934	0.7713	1.1373
Leaburg Dam to Marshall Island	1.1612	0.1898	0.7891	1.5333
Marshall Island to Hops Farm	1.0396	0.2766	0.4975	1.5817
Temperature control tower to Leaburg Dam	0.6364	0.0682	0.5026	0.7701
Temperature control tower to Marshall Island ¹	0.7389	0.1160	0.5115	0.9664

¹ Minimum reach for expression of treatment effects.

Dam Safety Considerations

During previous deep drawdowns (to elevations deeper than the proposed minimum elevation of 1505 ft. for this operation), a temporary increased rate of settlement occurred. The mechanism for this increased settlement rate is being evaluated currently but deep drawdowns could potentially increase the likelihood of potential failure modes for the dam. Although drawdown to elevation 1505 ft. is not expected to increase dam safety related risk, a monitoring plan will be developed prior to the implementation of this operation. The plan will include details for performing a dam crest survey and collecting and reviewing data from existing instrumentation.

Corps engineers recommend maintaining pressurized flow in the regulating conduit during this operation. With the 12.5 foot full gate opening on the Cougar ROs and an invert elevation of 1478.5 ft, MSL, the ROs should not be operated if the water surface elevation drops below

1499.5 ft, MSL. While there is no intention to operate below 1500 ft, maximum gate openings that should be maintained below 1500 ft are listed in Table 3 below.

Table 3. Recommended Maximum Gate Openings for Specified Low Reservoir Elevations, in feet

Reservoir Elevation (ft)	Maximum Gate Opening (ft)
1495	9.8
1494	9.2
1493	8.6
1492	8.0
1491	7.4
1490	6.8
1489	6.2
1488	5.6
1487	5.0
1486	4.4
1485	3.8
1484	3.2
1483	2.6
1482	2.0
1481	1.4

Power Impacts

The goal of this operation is to hold Cougar Reservoir at 1505 ft elevation during winter months while prioritizing the use of the ROs. Since the reservoir will be held below minimum power pool, the turbines will not be used. Therefore, station power will have to be supplied from the grid. In the event that the grid is unavailable, power will be provided by backup generators. Cougar Reservoir will be refilled starting on December 16 and is expected to reach minimum power pool (elevation 1516 ft.) sometime in January when hydropower generation can resume. This action will result in up to a 60-95% reduction in power generation, and an associated loss of power revenue, during the critical winter power production period. Starting the “no power period” earlier, or ending it later, will increase the proportion of generation reduced.

Transmission Considerations

Lane Electric Co-Op’s load at Blue River may be out for an extended period if the section of the Cougar – Holden Creek 115kV line between the Blue River Tap and EWEB’s Holden Creek Substation goes down due to icing, a windstorm, fire, or any other reason. When this has

happened in the past – such as during the wildfires of September 2020 -- the Blue River load has been served by generation at Cougar. If Cougar generation is unavailable, then it may be possible to serve the Blue River load from EWEB's Trailbridge or Carmen Smith plants; however, EWEB's transmission staff say that there are regulatory requirements associated with allowable river fluctuations that may make it difficult for them to do so. If EWEB's generation is unavailable, then the only way to provide power to meet the load at Blue River would be through portable diesel generators. Due to the short period prior to implementation, the opportunities to reinforce the system in this area are limited. Further discussions with EWEB are needed to determine whether an emergency provision to re-prioritize Cougar generation to avoid the human health and safety risks of load shedding at Lane Electric Co-Op during the balance of the operation may be necessary if EWEB cannot provide the needed generation.

With all the transmission facilities in service, there may still be some voltage support issues around Blue River and Holden Creek, especially high voltage issues during light load periods. Typically, Cougar generation helps to provide this voltage support. EWEB's generation may be able to provide some help with this needed voltage control, but EWEB's ability to do so may be limited by regulatory requirements.

In addition, reduction, or elimination of generation at Cougar will result in a corresponding increase in the flow of power on the portions of transmission system that carry electricity from east of the Cascade mountains to major load centers on the west side of the Cascades which would marginally increase the stress on these pathways during high load conditions.

Plaintiff experts dissent

We proposed the following RM&E that were rejected by Federal experts apparently for funding or contractual reasons. We fully support the operational aspects of the implementation plan to achieve the fall drawdown. We also feel more information could be collected to inform future fall drawdowns as well as development of a more comprehensive RM&E plan. We realize that results from the 2021 RM&E activities will not be as robust as would be obtained through studies implemented under a more comprehensive plan. However, we believe that tag-based studies we have proposed and the Corps has rejected as unachievable in the time available, would provide much more useful information than the limited activities proposed in the plan above alone. We support conducting all of the studies in the above plan, but we believe they aren't enough. Our proposed studies are technically feasible. That is, hatchery fish would be available to tag and release, tag detection is available downstream at the Walterville Canal diversion outlet (operated by ODFW in cooperation with Eugene Water and Electric Board), and other methods are possible for sampling juvenile fish downstream such as seines or trap nets. Implementation would require a supply of tags, personnel to tag and release fish, and personnel for downstream sampling.

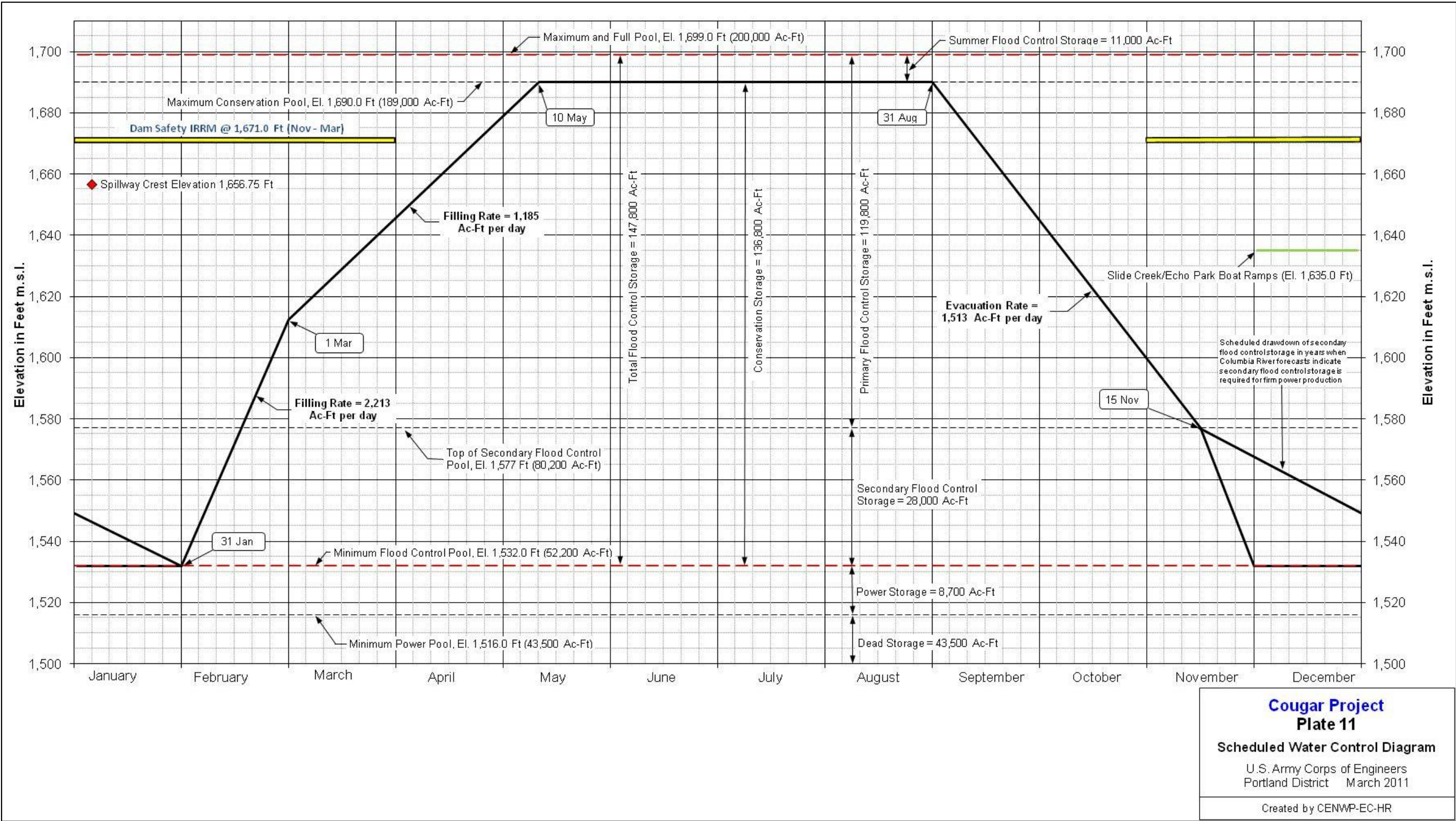
Although we recognize that the Corps may be under some constraints in regards to funding or contracts, we also feel it is important that such constraints be fully explained and that potential solutions be explored before rejecting important RM&E activities.

Briefly our RM&E activities were:

1. Release tagged juvenile fish above the reservoir or in the head of the reservoir in late September. Note that ODFW has expressed a willingness to use their tags to expedite this study if they could be reimbursed or get replacement tags. The U.S. experts responded that: "Federal procurement and fiscal laws and regulations prohibit the Corps from reimbursing ODFW for tags or replacing tags. The Corps would need to either perform this work in house or issue a contract in advance of the work occurring, and there is no time to accomplish either in 2021. However, the Federal Government is open to discussing this type of study for potential implementation in future years."
2. Release tagged juvenile fish in the reservoir near the dam with a control group released below the dam in mid to late October prior to reaching full drawdown.
3. Release a second group of tagged fish at the dam and downstream during full drawdown.
4. Monitor passage at all available monitoring sites downstream from the dam to the Walterville canal.

More detail on these activities was included in the draft implementation plan and can be provided to the Court upon request.

Figure 1. Cougar Reservoir Water Control Diagram



References

Beeman, J.W., Hansel, H.C., Hansen, A.C., Evans, S.D., Haner, P.V., Hatton, T.W., Kofoot, E.E., Sprando, J.M., and Smith, C.D., 2013, Behavior and Dam Passage of Juvenile Chinook Salmon at Cougar Reservoir and Dam, Oregon, March 2012–February 2013: U.S. Geological Survey Open-File Report 2013-xxx, xx p..