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Protecting ESA-Listed Bull Trout in the Face of Climate Change: Can the Endangered Species Act and the Clean Water Act Do Their Part?

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**PROTECTING ESA-LISTED BULL TROUT IN THE FACE OF
CLIMATE CHANGE:
CAN THE ENDANGERED SPECIES ACT AND THE CLEAN
WATER ACT DO THEIR PART?**

Dr. Jonathan S. Drake, J.D., Ph.D.*

Both the U.S. Endangered Species Act (ESA) and the Clean Water Act (CWA) potentially will provide species protection for bull trout and its coldwater habitat. The author outlines both Acts, focusing on their application to bull trout survival in the face of climate change. Specific reference is made to “best available science,” ESA listing and consultation, and CWA total maximum daily load (TMDL) for water temperature. The experiences of the States of Idaho and Montana are compared.

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I. ENDANGERED SPECIES ACT

The Endangered Species Act (“ESA”)¹ provides a program for the conservation of threatened and endangered plants and animals and the habitats in which they are found, and upon which they depend for their existence. There are two federal agencies that share responsibility for implementing ESA—the U.S. Fish and Wildlife Service (“USFWS”) and the U.S. National Oceanic and Atmospheric Administration (“NOAA”) (hereinafter together “the Services”).² According to these agencies, over 1,500 species of plants and animals receive some type of protection under the ESA.³ The protected species include birds, insects, fish, reptiles, mammals, crustaceans, flowers, grasses, and trees. ESA Section 2(b) states that the purpose of the ESA is to protect and recover imperiled species and the ecosystems upon which they depend.⁴ The USFWS has primary responsibility for terrestrial and freshwater organisms, such as bull trout, discussed *infra*, while the responsibilities of NOAA are mainly marine wildlife, such as whales, and anadromous fish, such as salmon, which are not the focus of this article.

1. 16 U.S.C. §§ 1531–1544 (2018).

2. *Summary of the Endangered Species Act*, U.S. ENVTL. PROT. AGENCY (July 5, 2019), <https://www.epa.gov/laws-regulations/summary-endangered-species-act>.

3. *Environmental Conservation Online System, Listed Animals*, U.S. FISH & WILDLIFE SERV., <https://go.usa.gov/xVXNs> (last visited Sept. 9, 2019); *Species Directory*, NOAA FISHERIES, <https://www.fisheries.noaa.gov/species-directory/threatened-endangered> (last visited Oct. 5, 2019).

4. 16 U.S.C. §§ 1531–1544 (2018).

A. Listing Under the ESA Section 4

Under Section 4 of the ESA, which describes the listing process, species may be listed as either endangered or threatened.⁵ Those definitions appear in Section 3 of the Act.⁶ "Endangered" means a species is in danger of extinction throughout all or a significant portion of its range. "Threatened" means that a species, such as bull trout, is likely to become endangered within the foreseeable future. All species of plants and animals, except pest insects, are eligible for listing as endangered or threatened. For the purposes of the ESA, Congress defined species to include subspecies, varieties, and, for vertebrates, distinct population segments ("DPS").⁷ For example, bull trout are currently listed as a single DPS in the co-terminus United States.⁸

USFWS and NOAA have considered climate change impacts during the ESA listing of several high-profile species. For example, the polar bear⁹ was listed by the USFWS as a threatened species.¹⁰ NOAA listed elkhorn and staghorn corals as threatened, having declined by up to 90 percent in portions of their range.¹¹

B. ESA Section 7 Protections

Once a species becomes listed, Section 7 of the ESA requires federal agencies, in consultation with the USFWS and/or the NOAA Fisheries Service, to ensure that actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of designated critical habitat of

5. *Id.*

6. *Id.*

7. *Id.*

8. Endangered and Threatened Wildlife and Plants; Determination of Threatened Status for Bull Trout in The Conterminous United States, 64 Fed. Reg. 58,910 (Nov. 1, 1999).

9. Endangered and Threatened Wildlife and Plants; 12-Month Petition Finding and Proposed Rule to List the Polar Bear (*Ursus maritimus*), 72 Fed. Reg. 1063–65 (Jan. 9, 2007). Higher temperatures in the Arctic are melting the sea ice putting polar bears at risk.

10. Endangered and Threatened Wildlife and Plants; Determination of Threatened Status for the Polar Bear (*Ursus maritimus*) Throughout Its Range, 73 Fed. Reg. 28,211 (May 15, 2008).

11. Elevated sea temperatures and rising sea levels cause coral bleaching events. Endangered and Threatened Species: Final Listing Determinations for Elkhorn Coral and Staghorn Coral, 71 Fed. Reg. 26,852, 26,857 (May 9, 2006).

such species.¹² The law also prohibits any action that causes a "taking" of any listed species of endangered fish or wildlife, as defined in Section 9 of the ESA.¹³ Likewise, import, export, interstate, and foreign commerce of listed species are all generally prohibited.

C. *Citizen Suits Under the ESA*

Citizen suit provisions in the ESA are found in Section 11(g).¹⁴ This unique style of provision is found in a number of U.S. federal environmental laws and allows citizens, citizen organizations, and economic interest groups to file law suits against the federal government, state or local government, or other private parties when there has been a violation of an obligation of the ESA, or to challenge permits issued under the ESA.¹⁵ While a party still must prove standing to sue, the typical barriers to the federal jurisdiction, such as minimum amount in controversy and diversity, do not appear in the ESA. Also, under certain circumstances, a prevailing plaintiff may be able to recover attorney fees and expert witness costs. This citizen suit provision represents one of the most important powers given to private parties, i.e., the ability to force the government, primarily the Secretary of Interior, to perform its required duties under the law, when it might not be politically expedient.¹⁶ Bull trout provide an example of a species that the federal government was not eager to list because of the economic consequences. But a series of petitions and citizen suits forced the USFWS to complete the bull trout listing, despite the political and potential economic consequences.¹⁷

12. *Summary of the Endangered Species Act*, U.S. ENVTL. PROT. AGENCY (July 5, 2019), <https://www.epa.gov/laws-regulations/summary-endangered-species-act>.

13. *Id.*

14. *Id.*

15. Kirsten Nathanson, Thomas R. Lundquist & Sarah Bordelon, *Developments in ESA Citizen Suits and Citizen Enforcement of Wildlife Laws*, 29 NAT. RESOURCES & ENVIRONMENT, no. 3, Winter 2015.

16. Ivan J. Lieben, *Political Influences on USFWS Listing Decisions under the ESA: Time to Rethink Priorities*, 27 ENVTL. L., no. 4, Winter 1997, at 1323, 1371.

17. Tim Bechtold, *Listing the Bull Trout under the Endangered Species Act: The Passive-Aggressive Strategy of the United States Fish and Wildlife Service to Prevent Protecting Warranted Species*, 20 PUB. LAND & RESOURCES L. REV. 99, 113–22 (1999).

II. BULL TROUT ESA LISTING AND THEIR LIFE HISTORY

In November 1999, the USFWS listed all populations of bull trout within the coterminous United States as a threatened species pursuant to the Endangered Species Act of 1973, as amended.¹⁸ This followed several years of listing petitions and litigation in order to produce a listing decision. Bull trout currently remain listed as “threatened.”¹⁹

Bull trout (*Salvelinus confluentus*) are members of the char subgroup of the family Salmonidae. They are native to waters of western North America. In the United States, bull trout range widely through the Columbia River and Snake River basins, extending east to headwater streams in Idaho and Montana (including the Saint Mary headwaters east of the continental divide), into Canada and southeast Alaska, and to the Puget Sound and Olympic Peninsula watersheds of western Washington and the Klamath River basin of south-central Oregon. Historically, bull trout also lived in the Sacramento River basin in California. In general, the current distribution of bull trout is fragmented and localized within the boundaries of its historical range.²⁰

Of native salmonids in the Pacific Northwest of the United States, bull trout have the most specific habitat requirements,²¹ which are often referred to as “the four Cs”: Cold, Clean, Complex, and Connected habitat. These requirements include cold water temperatures compared to other salmonids (often less than 12°C [54°F]).²² For example, initiation of spawning by bull trout in Montana’s Flathead River system appeared to be related largely to water temperature, with spawning initiated when water temperatures dropped below 10°C (50°F).²³ Others have reported a

18. Endangered and Threatened Wildlife and Plants; Determination of Threatened Status for Bull Trout in The Conterminous United States, 64 Fed. Reg. 58,910 (Nov. 1, 1999).

19. *Environmental Conservation Online System: Bull Trout (Salvelinus confluentus)*, U.S. FISH & WILDLIFE SERV. (Dec. 2019), <https://ecos.fws.gov/ecp0/profile/speciesProfile?spcode=E065>.

20. *Id.*

21. Bruce E. Rieman & John D. McIntyre, *Demographic and Habitat Requirements for Conservation of Bull Trout*, General Technical Report INT-302, U.S. FOREST SERV. (Sept. 1993), https://www.fs.fed.us/rm/pubs_int/int_gtr302.pdf.

22. *Recovery Plan for the Coterminous United States Population of Bull Trout (Salvelinus confluentus)*, U.S. FISH & WILDLIFE SERV. (Sept. 29, 2015), https://www.fws.gov/pacific/bulltrout/pdf/Final_Bull_Trout_Recovery_Plan_092915.pdf.

23. John J. Fraley & Bradley B. Shepard, *Life History, Ecology, and Population Status of Migratory Bull Trout in the Flathead Lake River System, Montana*, 63 NORTHWEST SCI., no. 4, 1989, at 133–43.

temperature range from 4 to 10°C (39 to 50°F).²⁴ Such areas often are associated with cold-water springs or groundwater upwelling.²⁵ This bull trout requirement for cold water temperature has gained widespread acceptance today. However, at the time of its 1999 ESA listing decision, the USFWS did not discuss climate change as a factor for bull trout decline.

A. Bull Trout Status Review

Likewise, a 2008 bull trout status review conducted by the USFWS determined that historical habitat loss and fragmentation, interaction with nonnative species, and fish passage issues comprised the most significant primary threat factors affecting bull trout.²⁶ This status review did not address climate change as a risk factor, although it did refer to scientific studies on climate change²⁷ and water temperature requirements for bull trout.²⁸ The connection between climate change and water temperature in bull trout streams was not made explicit.

B. Bull Trout Recovery Plan

Finally, a 2015 recovery plan attempted to address climate change as a factor affecting bull trout recovery planning, but the attempt fell short of specific findings or concrete recovery actions. The 2015 Recovery Plan only goes so far as to state:

Because the effectiveness of many of the recovery actions described in this recovery plan, as well as future climate

24. FRED GOETZ, BIOLOGY OF THE BULL TROUT *SALVELINUS CONFLUENTUS*: A LITERATURE REVIEW (1989).

25. Bruce E. Rieman, Danny C. Lee & Russell F. Thurow, *Distribution, Status, and Likely Future Trends of Bull Trout within the Columbia River and Klamath Basins*, 17 N. AM. J. OF FISHERIES MGMT. 1111–25 (1997); Colden V. Baxter, Christopher A. Frissell, and F. Richard Hauer, *Geomorphology, Logging Roads and the Distribution of Bull Trout Spawning in a Forested River Basin: Implications for Management and Conservation*, 128 TRANSACTIONS OF THE AM. FISHERIES SOC'Y 854–67. (1999)

26. *Bull Trout (Salvelinus confluentus) 5-year Review: Summary and Evaluation*, U.S. FISH & WILDLIFE SERV. (Apr. 25, 2008), <https://www.fws.gov/pacific/bulltrout/pdf/Bull%20Trout%205YR%20final%20signed%20042508.pdf>.

27. SNOVER, A.K., P. W. MOTE, L. WHITELY BINDER, A.F. HAMLET & N. J. MANTUA. UNCERTAIN FUTURE: CLIMATE CHANGE AND ITS EFFECTS ON PUGET SOUND 35 (2005).

28. Bruce E. Rieman, et al., *Anticipated Climate Warming Effects on Bull Trout Habitats and Populations Across the Interior Columbia River Basin*, 136 TRANSACTIONS OF THE AM. FISHERIES SOC'Y 1552–65 (2007).

effects, are not yet completely understood or fully predictable, we will apply adaptive management principles to future monitoring, implementation, and other recovery actions for bull trout.²⁹

It appears that, with respect to bull trout recovery planning and climate change, the recovery plan relies upon the broad, and often criticized, concept of “adaptive management” applied to the ESA.³⁰ Critiques of adaptive management and the ESA in the face of climate change are numerous,³¹ as well as proposed solutions to the problem of climate uncertainty,³² such that this article need not discuss adaptive management further.

C. “Best Available Science” as Applied to Bull Trout

It remains inexplicable why climate change does not form a core component of bull trout recovery planning. After all, the ESA itself requires the use of the “best available science” in decision-making.³³ Although the ESA does not contain any separate provision to use best available science, it contains various provisions that incorporate that standard. For, with respect to listing and delisting, Section 4(b)(1)(A) states that the federal wildlife agencies do so “on the basis of the *best scientific and commercial data available*.”³⁴

Likewise, with respect to critical habitat designation, Section 4(b)(2) requires that federal wildlife agencies “shall designate critical habitat, and make revisions thereto, under subsection (a)(3) on the basis of the *best scientific data available* and after taking into consideration the

29. *Recovery Plan for the Coterminous United States Population of Bull Trout (Salvelinus confluentus)*, U.S. FISH & WILDLIFE SERV. vi (Sept. 29, 2015), https://www.fws.gov/pacific/bulltrout/pdf/Final_Bull_Trout_Recovery_Plan_092915.pdf

30. Holly Doremus, *Adaptive Management, the Endangered Species Act, and the Institutional Challenges of New Age Environmental Protection*, 41 WASHBURN L.J. 50 (2001–2002).

31. J.B. Ruhl & James Salzman, *Climate Change, Dead Zones, and Massive Problems in the Administrative State: A Guide for Whittling Away*, 98 CALIF. L. REV. 59 (2010).

32. Alejandro E. Camacho, *Adapting Governance to Climate Change: Managing Uncertainty through a Learning Infrastructure*, 59 EMORY L.J. 1 (2009).

33. 16 U.S.C. §§ 1531–1544 (2018); DENNIS D. MURPHY & PAUL S. WEILAND, *GUIDANCE ON THE USE OF BEST AVAILABLE SCIENCE UNDER THE U.S. ENDANGERED SPECIES ACT*, 58 ENVTL. MGMT. 1 (2016).

34. 16 U.S.C. §§ 1531–1544 (2018) (emphasis added).

economic impact, the impact on national security, and any other relevant impact, of specifying any particular area as critical habitat.”³⁵ Finally, the interagency consultation provisions of the ESA in Section 7(a)(2) state that: “[i]n fulfilling the requirements of this paragraph, each agency shall use the *best scientific and commercial data available*.”³⁶

At present, scientists have discovered a wealth of “best available science” concerning bull trout, their habitat requirements, and the effects of warmer water temperatures on their well-being and survival. For example, we know that bull trout already seem to inhabit the coldest available streams and, in several watersheds, bull trout do not have the potential to shift upstream with warming stream temperatures at lower elevations.³⁷ This becomes important when we realize that stream isotherms are projected to shift upstream at a rate of about 0.3 to 3.0 kilometers per decade, depending on stream slope.³⁸ This increases the probability of habitat abandonment at low elevation for bull trout while providing evidence validating the predictions made by bioclimatic models that bull trout populations will retreat to higher, cooler thermal refuges as water temperatures increase.³⁹ For example, in the Flathead Basin of Montana, projected losses of thermally suitable spawning and rearing habitat for bull trout during the month of August ranged from 13 to 82 percent across three plausible climate change scenarios; losses of foraging, migration, and overwintering habitat ranged from 38 to 91 percent.⁴⁰

It is clear that bull trout are vulnerable to the effects of warming climates, changing precipitation, and altered hydrologic regimes. As such, both the USFWS⁴¹ and environmental groups⁴² maintain that bull trout have become an indicator species of the effects that climate change will

35. *Id.* (emphasis added).

36. *Id.*

37. Seth J. Wenger et al., *Flow Regime, Temperature, and Biotic Interactions Drive Differential Declines of Trout Species Under Climate Change*, 108 PROCEEDINGS OF THE NAT. ACAD. OF SCIS. OF THE U.S. 14175–80 (2011).

38. Daniel J. Isaak & Bruce E. Rieman, *Stream Isotherm Shifts from Climate Change and Implications for Distributions of Ectothermic Organisms*, 19 GLOBAL CHANGE BIOLOGY 742, 751 (2013).

39. LISA A. EBAY ET AL., EVIDENCE OF CLIMATE-INDUCED RANGE CONTRACTIONS IN BULL TROUT *Salvelinus confluentus* IN A ROCKY MOUNTAIN WATERSHED, U.S.A., 9 PLOS ONE e98812 (2014).

40. Leslie A. Jones et al., *Estimating Thermal Regimes of Bull Trout and Assessing the Potential Effects of Climate Warming on Critical Habitats*, 30 RIVER RESEARCH APPLICATIONS 20, 216 (2014).

41. *About Bull Trout*, U.S. FISH & WILDLIFE SERV. (Sept. 3, 2014), <https://www.fws.gov/pacific/bulltrout/About.html>.

42. *Bull Trout*, ENDANGERED SPECIES COAL., <https://www.endangered.org/animal/bull-trout/> (last visited Apr. 12, 2020).

have on mountainous stream ecosystems. Even the U.S. Forest Service (“USFS”) eventually selected bull trout as its Management Indicator Species,⁴³ in order to comply with an important court ruling,⁴⁴ which held that the USFWS practice of assessing changes in habitat would no longer be accepted as a substitute for direct monitoring of populations. USFS selected bull trout because the species is sensitive to habitat changes and dependent upon habitat conditions that are important to many aquatic organisms.

D. “Best Available Science” and Climate Change

Next, “best available science” has made it increasingly clear that climate change is occurring in the Pacific Northwest.⁴⁵ These changes include: 1) rising air temperature; 2) changes in the timing of stream flow related to changing snowmelt;⁴⁶ 3) increases in extreme precipitation events; and 4) lower summer stream flows and other changes.⁴⁷ Pertinent to bull trout, late summer stream flow in coastal ranges⁴⁸ and the central Rockies⁴⁹ has significantly declined since the midtwentieth century, with an average decline of 20 percent.⁵⁰ This corresponds with a warmer and drier climate, smaller snowpack, and earlier melt timing.⁵¹

The court held in *Colorado River Cutthroat Trout v. Salazar* that there exists “no statutory requirement” requiring the Services “to discuss

43. John Chatel & Scott Vuono, *2012 Sawtooth Bull Trout Management Indicator Species Monitoring Report*, U.S. Forest Serv. (2012), https://www.fs.fed.us/rm/boise/AWAE/projects/ClimateShield/downloads/Bibliography/07_Chatel12_SNF_BullTroutMIS_final_report.pdf.

44. *Sierra Club v. Martin*, 168 F.3d 1 (11th Cir. 1999).

45. Nathan Mantua et al., *Climate Change Impacts on Streamflow Extremes and Summertime Stream Temperature and Their Possible Consequences for Freshwater Salmon Habitat in Washington State*, 102 CLIMATIC CHANGE 187 (2010).

46. Holger Fritze, Iris T. Stewart & Edzer Pebesma, *Shifts in Western North American Snowmelt Runoff Regimes for the Recent Warm Decades*, 12 J. OF HYDROMETEOROLOGY 989 (2011).

47. Philip Mote et al., *Climate Change Impacts in the United States: The Third National Climate Assessment*, (2014), <https://nca2014.globalchange.gov/report/regions/northwest>.

48. Spencer R. Sawaske & David L. Freyberg, *An Analysis of Trends in Base Flow Recession and Low-flows in Rain-dominated Coastal Streams of the Pacific Coast*, 519 J. OF HYDROLOGY 599 (2014).

49. Jason C. Leppi et al., *Impacts of Climate Change on August Stream Discharge in the Central-Rocky Mountains*, 112 CLIMATIC CHANGE 997 (2012).

50. Philip W. Mote, *Climate-Driven Variability and Trends in Mountain Snowpack in Western North America*, 19 J. OF CLIMATE 6209 (2006).

51. Leppi, *supra* note 49.

climate change in [their] listing decisions.”⁵² Other cases have affirmed that the ESA does not expressly require the Services to consider the effect of climate change in their ESA decisions.⁵³

The burden may shift to other stakeholders to provide the “best available science” on the impacts of climate change, although this is not always upheld.⁵⁴ This may take place through petitions⁵⁵ and legal challenges to compel the Services to list species whose survival has been or may be threatened by climate change effects.⁵⁶ Other stakeholders have challenged the listing of species or petitioned the Services to delist a species, questioning whether model-based climate predictions constitute the “best scientific and commercial data available” on which to base ESA listing decisions. These challenges are mainly based on problems with “foreseeability” in climate change models. Various lawsuits⁵⁷ have challenged the Services’ interpretation of complex scientific data or models that predict short- and long-term effects from a changing global climate on specific species and their habitats. USFWS has attempted to address this foreseeability problem through internal memoranda.⁵⁸

However, it remains established law that the ESA and its implementing regulations (1) direct the Services to consider “natural or manmade factors affecting [a species’] continued existence” when

52. Colo. River Cutthroat Trout v. Salazar, 898 F. Supp. 2d 191, 206–07 (D.D.C. 2012).

53. *But see* Wild Rockies v. Lyder, 728 F. Supp. 2d 1126, 1140 (D. Mont. 2010).

54. Am. Stewards of Liberty v. Dep’t of the Interior, 370 F. Supp. 3d 711, 728–730 (W.D. Tex. 2019).

55. 16 U.S.C. § 1533(b)(2) (2018).

56. Petition from Animal Welfare Institute & Defenders of Wildlife to the United States Secretary of Commerce, Administrator of the National Oceanic and Atmospheric Administration, & the National Marine Fisheries Service, *Petition to List the Northwest Atlantic Distinct Population Segment of the Thorny Skate (Amblyraja radiata) as Endangered or Threatened or, Alternatively, to List the United States DPS of the Thorny Skate as Endangered or Threatened under the U.S. Endangered Species Act* (May 28, 2015), <https://awionline.org/sites/default/files/uploads/documents/AWI-ML-ThornySkate-ESA-Petition-submitted.pdf>; Petition from Shay Wolf, Center for Biological Diversity, to Dirk Kempthorne, Secretary of Interior, *Petition to List the Pacific Walrus (Odobenus rosmarus devergens) as a Threatened or Endangered Species under the Endangered Species Act* (Feb. 7, 2008), https://www.biologicaldiversity.org/species/mammals/Pacific_walrus/pdfs/CBD-Pacific-walrus-petition.pdf.

57. Ctr. for Biological Diversity v. Lubchenco, 758 F. Supp. 2d 945, 967 (N.D. Cal. 2010).

58. Memorandum (M-37021) from David L. Bernhardt, Solicitor, Dep’t of the Interior, to Acting Director, USFWS, *The meaning of “Foreseeable Future” in Section 3(20) of the Endangered Species Act* (Jan. 16, 2009), <https://www.fws.gov/endangered/esa-library/pdf/M-37021%20Foreseeable%20future.pdf>.

determining whether a species should be protected under the ESA; and (2) require the Services to analyze cumulative effects on a species' survival when analyzing whether federal actions jeopardize a species protected under the Act.⁵⁹ The courts and the Services have interpreted these provisions as requiring the Services to consider climate change effects in the ESA decision-making process. Courts have generally found that the USFWS met the requirement to consider cumulative threats from climate change when it provided "even a brief discussion" of such threats.⁶⁰

E. Bull Trout, ESA Critical Habitat, and Section 7 Consultation

Having achieved ESA-listed status, bull trout potentially receive their greatest protection from climate change via the application of Section 7 of the ESA to proposed activities occurring within its designated critical habitat.⁶¹ On September 30, 2010, the USFWS designated critical habitat for bull trout throughout their U.S. range.⁶² Approximately 18,795 miles of streams and 488,252 acres of lakes and reservoirs in Idaho, Oregon, Washington, Montana, and Nevada were designated as critical habitat for bull trout. The USFWS accomplished the designation despite being unable to predict the site-specific effects of climate change on bull trout habitat throughout the range of the species with certainty.⁶³

Generally, the Services and the courts have agreed that climate change should be considered during ESA Section 7 consultation. Section 7 requires federal agencies to "insure that any action authorized, funded, or carried out by such agency . . . is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of [the critical] habitat of such species."⁶⁴ A federal agency planning any action must consult with the National Marine Fisheries Service or the USFWS if the federal agency determines that its action "may" jeopardize a listed species or adversely affect

59. 16 U.S.C. § 1533(a)(1) (2018); 50 C.F.R. § 402.14(g) (2019); *Pac. Coast Fed'n of Fishermen's Ass'ns v. Gutierrez*, 606 F. Supp. 2d 1122, 1184 (E.D. Cal. 2008); *Nat. Res. Def. Council v. Kempthorne*, 506 F. Supp. 2d 322, 374–76 (E.D. Cal. 2007).

60. *Desert Survivors v. Dep't of the Interior*, 321 F. Supp. 3d 1011, 1049 (N.D. Cal. 2018).

61. Extension of the "take" prohibition to threatened species occurs under ESA Section 4(d) but is not discussed in this article.

62. *Endangered and Threatened Wildlife and Plants; Revised Designation of Critical Habitat for Bull Trout in the Coterminous United States; Final Rule*, 75 Fed. Reg. 63,898 (Oct. 18, 2010).

63. *Id.*

64. 16 U.S.C. § 1536(a)(2) (2018).

its habitat.⁶⁵ Section 7 specifies which type of consultation (e.g., informal versus formal consultation) is required, and the procedures for consultation.

Following a Section 7 consultation, the USFWS issues a biological opinion based on "the best scientific and commercial data available" that determines whether the proposed action is likely to jeopardize the ESA-listed species or adversely modify critical habitat.⁶⁶ If the USFWS determines that the action would likely jeopardize the listed species or its critical habitat, the proposed action is terminated, or a USFWS-proposed alternative action is implemented, or an exemption is sought.⁶⁷ If the action is not likely to jeopardize the continued existence of the species but could still result in some "incidental take" of the species, the biological opinion must set forth an incidental take statement, defining the permissible "amount or extent" of this effect on the species.⁶⁸

Despite its potential for protecting species that are vulnerable to climate change, courts have not been unanimous concerning the relevance of climate change to Section 7 consultations. A few court decisions have upbraided the USFWS for refusing to discuss climate change effects when assessing whether an action creates jeopardy to a listed species or adversely modifies its critical habitat.⁶⁹ Moreover, despite court rulings overturning biological opinions, commentators have noted that neither the courts nor the USFWS have determined that a proposed federal action, which itself causes climate change effects, would cause jeopardy to a species or adversely modify its habitat.⁷⁰

In fact, the U.S. Department of the Interior issued a Solicitor's Opinion explaining that Section 7 consultation is not required if no causal connection exists among the proposed federal action, a reasonably certain climate change effect, and the listed species.⁷¹ Federal agencies, such as the EPA and the USFWS, have relied on this policy to meet Section 7

65. *Id.*; 50 C.F.R. § 402.14(a) (2019).

66. 50 C.F.R. § 402.14(g)(8), (h)(2)–(3).

67. *Id.* §§ 402.15(a)–(c).

68. *Id.* § 402.14(i).

69. *Pac. Coast Fed'n of Fishermen's Ass'ns*, 606 F. Supp. 2d at 1184; *Nat. Res. Def. Council*, 506 F. Supp. 2d at 374–76; *Turtle Island Restoration Network v. Dep't of Commerce*, 878 F.3d 725 (9th Cir. 2017)

70. DAVID OWEN, *Chapter 6: Endangered Species Act*, GLOBAL CLIMATE CHANGE AND U.S. LAW 194 (Michael B. Gerrard & Jody Freeman eds., 2d ed. 2014), <https://ssrn.com/abstract=2354018>.

71. Memorandum from David Longly Bernhardt, Solicitor of the Dep't of the Interior, to Dirk Kempthorne, Secretary of the Interior, *Guidance on the Applicability of the Endangered Species Act's Consultation Requirements to Proposed Actions Involving the Emission of Greenhouse Gases* (Oct. 3, 2008).

consultation obligations.⁷² Unfortunately for bull trout, there rarely exists direct evidence of a causal connection between proposed actions and climate change effects. For that reason alone, Section 7 consultation will not be triggered by climate change, foreclosing any opportunity for the USFWS to consider mitigating the climate change effects on bull trout.

In a different federal realm, the USFS, as part of its Forest Plan process per the consultation requirements of Section 7(a)(1) of the ESA, developed its “Conservation Strategy for Bull Trout on USFS Lands in Western Montana.”⁷³ The strategy covers the Lolo, Bitterroot, Flathead, Beaverhead-Deerlodge, Kootenai, and Helena National Forests, all of which contain bull trout core populations. By outlining a systematic approach to measuring and monitoring water temperatures, it builds upon a coherent analytic framework,⁷⁴ specifically when classifying the functional status of sixth-field hydrologic unit codes that contain bull trout populations.⁷⁵

While this approach may be useful in prioritizing habitat actions, in the end it lacks any enforceable provisions, or any triggers which would reinitiate consultation, when temperature guidelines are exceeded. Instead, a citizen lawsuit would likely be required reinitiate consultation.⁷⁶ In addition, the administrative record of the USFS is replete with informal

72. Greenhouse Gas Emissions and Fuel Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles—Phase 2, Final Rule, 81 Fed. Reg. 73,478, 73,969 (Oct. 25, 2016).

73. USFS, *Conservation Strategy for Bull Trout on USFS Lands in Western Montana*, U.S. DEP’T OF AGRIC. (May 2013), https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5427869.pdf.

74. A Framework to Assist in Making Endangered Species Act Determinations of Effect for Individual or Grouped Actions at the Bull Trout Subpopulation Watershed Scale, U.S. FISH & WILDLIFE SERV. (Feb. 1998), https://www.fws.gov/montanafieldoffice/Endangered_Species/Bull_Trout_consultation/matrix.pdf.

75. See *Hydrologic Unit Maps*, U.S. GEOLOGICAL SURVEY (Jan. 16, 2020), <https://water.usgs.gov/GIS/huc.html> (“The United States is divided and subdivided into successively smaller hydrologic units which are classified into four levels: regions, sub-regions, accounting units, and cataloging units. The hydrologic units are arranged or nested within each other, from the largest geographic area (regions) to the smallest geographic area (cataloging units). Each hydrologic unit is identified by a unique hydrologic unit code (HUC) consisting of two to eight digits based on the four levels of classification in the hydrologic unit system.”).

76. See e.g., *Lawsuit Filed to Protect Critical Bull Trout Habitat on Payette National Forest*, W. ENVTL. LAW CTR. (Sept. 21, 2016), <https://westernlaw.org/lawsuit-filed-protect-critical-bull-trout-habitat-payette-national-forest-news-release-92116/>; *Bull Trout Roil Waters in Federal Court*, COURTHOUSE NEWS SERV. (Oct. 4, 2016), <https://www.courthousenews.com/bull-trout-roil-waters-in-federal-court/>.

Section 7 consultations for smaller individual projects, where bull trout and habitat were considered, but the project was ultimately approved.⁷⁷ Any such determination of “not likely to adversely affect” does little for bull trout, however warranted it appears.

F. ESA Summary

To summarize, the outlook appears somewhat mixed with respect to the ESA and its ability to protect bull trout from the effects of climate change.⁷⁸ When enacting the Endangered Species Act in 1973, Congress did not need to consider climate change as a significant factor in conserving endangered species.⁷⁹ The USFWS and the courts would agree that actions taken under the ESA must at least consider climate change effects on bull trout and its critical habitat. However, it remains unclear whether the ESA can adequately protect and conserve bull trout to the extent it remains threatened by climate change.

What has become clear, however, is that litigation could influence how the USFWS factors climate change effects into ESA decisions affecting bull trout. By analogy, for other listed species, lawsuit challenges have ensured that the USFWS considers climate change effects on species in their ESA decisions, to the extent those effects are foreseeable. When challenged, the courts have deferred to the USFWS, and avoided using the ESA as a tool to protect listed species from climate change by regulating federal activities.

Unfortunately, at present, the USFWS may not possess the best available scientific and commercial data to decide whether a proposed activity could cause detrimental effects to bull trout or their habitat under the ESA. As in USFS Forest Plans, the best available data on stream temperature and bull trout occurrence, particularly baseline data, may come from the applicant, itself. However, in the future, as climate modeling advances, and stream temperatures undergo intensive monitoring throughout the range of bull trout, the USFWS may improve its precision in predicting

77. See e.g., USFS, *Bull Trout Biological Assessment May 2017*, U.S. DEP'T OF AGRIC., https://www.fs.usda.gov/nfs/11558/www/nepa/103603_FSPLT3_4052931.pdf (typing such projects).

78. Compared with citizens suits on effects of dams on bull trout habitat. E.g. *All. for Wild Rockies, Inc. v. U.S. Army Corps. of Eng'rs.*, 237 F. Supp. 3d 1079 (D. Or. 2017).

79. For further discussion, see Barry Kellman, *Climate Change in the Endangered Species Act: A Jurisprudential Enigma*, 46 ENVTL. L. REP. 10845, 10854 (2016).

the causes and effects of climate change on bull trout. One hopes that more information and analysis may produce better ESA protections for bull trout.

III. CLEAN WATER ACT

A. *Climate Change*

Climate change increases air temperatures, which are already raising water temperatures in streams, lakes, and rivers where ESA-listed bull trout reside⁸⁰. However, the Clean Water Act (“CWA”) does not seek, and lacks the means, to reverse climate change. The CWA cannot regulate emissions of pollutants into the air, e.g., CO₂ and other greenhouse gasses (“GHGs”).⁸¹ Climate change has already begun to affect water temperature by the time pollutants have changed the atmosphere. Thus, the CWA does not work for climate change mitigation, per se, but instead addresses impacts to bull trout and their adaptation.

B. *Water Pollution*

Congress enacted the CWA in 1972 to “restore and maintain the chemical, physical, and biological integrity of the Nation’s waters.”⁸² The CWA states, “the discharge of any pollutant by any person shall be unlawful.”⁸³ A “discharge of a pollutant” is “(A) any addition of any pollutant to navigable waters from any point source, [and] (B) any addition of any pollutant to the waters of the contiguous zone or the ocean from any point source other than a vessel or other floating craft.”⁸⁴ To reduce the discharge of pollutants into navigable waters, the CWA, through the states, begins by directly regulating point-source pollution through its permitting requirements and process.⁸⁵ A “point source” is “any discernible, confined, and discrete conveyance,” e.g., pipe.⁸⁶ Other sources of water pollution, e.g., runoff, that do not qualify as point sources become “nonpoint sources,” which the states regulate through other permits, i.e., a Section 402 NPDES permit.⁸⁷

80. Rieman, *supra* note 28.

81. *See* Clean Air Act of 1963, 42 U.S.C. §§ 7401–7671(q) (2018).

82. 33 U.S.C. § 1251(a).

83. *Id.* § 1311(a).

84. *Id.* § 1362(12).

85. *Id.* §§ 1311(a), 1362(12).

86. *Id.* § 1362(14).

87. *Id.* §§ 1329, 1342.

When point-source regulation does not adequately improve polluted waters, the CWA uses a broader, water-quality based approach, which does not rely on identifying point sources.⁸⁸ CWA Section 1313 requires states to identify “water quality limited segments” (“impaired waters”) and rank their impaired waters in order of priority. States may designate that a water body is impaired, not only because of a high level of a specific pollutant, e.g., nitrogen, but as a result of a condition such as temperature or turbidity. The states’ rankings are then referred to as “§ 303(d) lists.”

C. Total Maximum Daily Load

Once a state has submitted its Section 303(d) list, it must then submit to the EPA for approval the “total maximum daily load” (“TMDL”) for each pollutant in each impaired water segment. This TMDL sets the maximum amount of a pollutant that each segment can receive without exceeding the applicable water quality standard.⁸⁹

States had to send the EPA their initial priority ranking of impaired waters and completed TMDLs within 180 days of the agency’s identification of covered pollutants⁹⁰ which the EPA published in 1978, making the original priority rankings and TMDLs due by 1979. The CWA also requires states to update their priority rankings and submit remaining TMDLs “from time to time.”⁹¹ The EPA, within thirty days of its submission, “shall either approve or disapprove” a TMDL.⁹² Once approved, the TMDL goes into effect, but if the EPA disapproves, the agency “shall” produce and issue its own TMDL within thirty days.⁹³

To assist this process, the EPA establishes reference water-quality criteria,⁹⁴ based on “the latest scientific knowledge” regarding the effects and action of the pollutant in water.⁹⁵ In addition, the EPA must “develop and publish” information regarding restoration and maintenance of water quality; how to protect fish, and wildlife in various kinds of waters; how to measure water quality; and how to set TMDLs.⁹⁶ Because these

88. *Id.* § 1313.

89. *Id.* §§ 1313(d)(1)(A), (C).

90. *Id.* § 1313(d)(2).

91. *Id.*

92. *Id.*

93. *Id.*

94. *Id.* § 1314.

95. *Id.* § 1314(a)(1).

96. *Id.* § 1314(a)(2).

provisions CWA are not discretionary, citizen suits are authorized in federal court against the EPA for failure to fulfill its CWA duties.⁹⁷

D. CWA and Bull Trout

For bull trout, water temperature TMDLs may provide the best protection from dangerous water temperatures caused by climate change. This may be accomplished through the process of state water quality standards (“WQS”). The CWA requires states to set WQS for all the navigable waters within their boundaries.⁹⁸ WQS have two components: “designated uses,” i.e., the uses that the state waters support, which includes all existing uses, and “water-quality criteria,” which consist of the measurable and descriptive standards for various water pollutants, e.g., temperature, sediments, pH, toxins, bacteria, and nutrients. The uses and standards intersect because state waters must meet their “water quality criteria” to support the “designated uses.”⁹⁹

Fortunately for bull trout, heat has long been listed as a pollutant under the CWA.¹⁰⁰ Furthermore, increasing water temperatures can also render a state’s existing “designated uses” unsupportable, e.g., recreational trout fisheries in cold water streams in which trout begin to die as water temperatures climb to lethal levels. Add to this the EPA’s anti-degradation policy, under which states must protect and maintain “[e]xisting in stream water uses and the level of water quality necessary to protect the existing uses.”¹⁰¹ However, on the other hand, some commentators have pointed out that states cannot amend their WQS to reflect climate change impacts on water quality even if those impacts mean that maintaining previously existing uses, such as recreational trout fisheries, has become impossible.¹⁰² This probably represents an unintended consequence of conflicting statutory purposes, leaving the states stuck with their existing CWA violations.¹⁰³

Because existing concentrations of GHGs in the atmosphere produce climate warming, potentially, a state WQS could already be in violation of the CWA, i.e., water temperature, without any means for

97. *Id.* § 1365(a).

98. *Id.* § 1313(a), (c).

99. 40 C.F.R. §§ 131.3(b), (f) (2019).

100. 33 U.S.C. § 1362(6) (2018).

101. 40 C.F.R. § 131.12(a)(1).

102. Robin K. Craig, *The Clean Water Act on the Cutting Edge: Climate Change and Water-Quality Regulation*, 24 NAT. RESOURCES & ENV’T, no. 2, 2009, at 14–18.

103. *Id.*

correction. Because temperature problems may not arise from ordinary point sources of water pollution, there is no point source to regulate. A state could attempt to regulate the impacts of increasing concentrations of GHGs in the atmosphere as a TMDL, or nonpoint-source pollution, analogous to regulating mercury deposition from air pollution.¹⁰⁴

This approach should not work. First, the Clean Air Act (“CAA”), not the CWA, regulates air pollution, which should never result in an unwelcome overlap between two very distinct environmental laws. Second, the CWA operates to address local, and occasional regional, water quality problems. The CWA contains no global provisions, the scale at which climate change physically occurs. Third, the EPA lacks explicit statutory authority to combine CWA and CAA regulation as part of any global regulatory approach to address climate change impacts comprehensively.

Nonetheless, states have developed TMDLs for water temperature to protect bull trout. These have grown into effective regulatory frameworks, allowing each state to follow its unique legislative and social trajectory when faced with climate change. Two states in particular, Montana and Idaho, deserve closer examination.¹⁰⁵

E. State TMDLs for Temperature—Montana

The State of Montana Department of Environmental Quality (“Montana DEQ”) submitted its 2018 Final Water Quality Integrated Report to the EPA for the given reporting cycle.¹⁰⁶ This includes both the Section 303(d) list and Section 305(b) Report as required under the federal Clean Water Act. Elevated water temperature is included as a non-point source pollutant for various categories, including agriculture, forestry, hydraulic modification, and riparian/wetland alteration.¹⁰⁷

Importantly, Montana’s 2018 Integrated Report concludes that climate changes can have far reaching harmful effects on its aquatic environment. Specific to water quality, Montana acknowledges:

104. *Northeast Regional Mercury Total Maximum Daily Load*, NEW ENGLAND INTERSTATE WATER POLLUTION CONTROL COMM’N 31–32 (Oct. 24, 2007), <http://click.neiwppcc.org/mercury/mercury-docs/FINAL%20Northeast%20Regional%20Mercury%20TMDL.pdf>.

105. For brevity, this article will not cover each state’s CWA anti-degradation policy, although each has one.

106. *Final 2018 Water Quality Integrated Report*, MONT. DEP’T OF ENVTL. QUALITY 1–71 (Jan. 31, 2019), http://deq.mt.gov/Portals/112/Water/WQP/CWAIC/Reports/IRs/2018/2018_IR_Final.pdf).

107. *Id.* at 32–34.

[W]arming temperatures contributing to higher stream temperatures and more intense watershed disturbances (e.g., rain events, flooding, high stream flows, landslides, large forest fires), which would likely lead to negative effects on aquatic life, *including native fish populations*. Warmer temperatures will change precipitation patterns, such as winter rain events that could speed melting of the snowpack. Periodic droughts could also amount available for release to maintain flows needed for optimal stream temperatures and aquatic habitat.¹⁰⁸

Then, Montana takes the important next step of specifically listing climate change as a category of non-point source pollution, caused by human activity and “other.”¹⁰⁹

Montana DEQ develops TMDLs for its impaired and threatened water bodies through integrated efforts within a defined geographic area, i.e., watershed. Whenever a single water body is impaired or threatened from multiple pollutants, the Montana DEQ provides multiple TMDLs.¹¹⁰ Montana has created numerous temperature TMDLs through the state’s many watersheds, providing full coverage for bull trout waters, among others.¹¹¹ As one example, the Bitterroot Headwaters TMDL was approved by the EPA in 2011.¹¹² Montana DEQ’s final Bitterroot TMDLs were decided in 2014.¹¹³ TMDL remediation was prescribed for sediment and thermal concerns in West Fork Bitterroot River and Hughes Creek, as well as for thermal issues in other creeks. The Bitterroot River includes several important bull trout core area waters.^{114, 115}

108. *Id.* at 37 (emphasis added).

109. *Id.*

110. *Id.* at 28.

111. See e.g., *Appendix D Fisheries and Aquatic Life*, MONT. DEP’T OF ENVTL. QUALITY (Mar. 2005), https://deq.mt.gov/Portals/112/Water/WQPb/TMDL/PDF/Grave/K01-TMDL-02a_App_D.pdf.

112. Water Quality Planning Bureau, *Bitterroot Temperature and Tributary Sediment Total Maximum Daily Loads and Framework Water Quality Improvement Plan*, MONT. DEP’T OF ENVTL. QUALITY (Aug. 17, 2011), <https://deq.mt.gov/Portals/112/water/wqpb/CWAIC/TMDL/C05-TMDL-03a.pdf>.

113. Water Quality Planning Bureau, *Final – Bitterroot Watershed Total Maximum Daily Loads and Water Quality Improvement Plan*, MONT. DEP’T OF ENVTL. QUALITY (Dec. 3, 2014) <http://deq.mt.gov/Portals/112/water/wqpb/CWAIC/TMDL/C05-TMDL-04a.pdf>.

114. *Id.* at 7-1.

115. A comprehensive Bitterroot watershed TMDL portal can be found at: <http://montanatmdlflathead.pbworks.com/w/page/55313043/Completed%20TMDLs%20in%20the%20Bitterroot%20River%20Watershed>.

Thus, one can conclude that Montana has successfully applied the CWA, by the Montana DEQ's application of its TMDL and nonpoint source programs. TMDLs exist for water temperature, while water temperature also makes its appearance on the non-point source pollution list. While the details may still need to be worked out regarding effectiveness monitoring¹¹⁶ and measurement, bull trout clearly receive the benefits and protections of the CWA in Montana.

F. State TMDLs for Temperature—Idaho

Idaho differs from Montana in its approach to temperature TMDLs. It is true that Idaho, like Montana, recognizes that federal regulations implementing the CWA requires Idaho to adopt water quality standards that restore and maintain the chemical, physical, and biological integrity of its waters. Likewise, Idaho accepts the need for standards to include criteria limiting water temperature to protect aquatic species that may be sensitive to warmer water temperature, including bull trout.

However, unlike Montana, the Idaho Department of Environmental Quality ("Idaho DEQ") has not added temperature to its list of nonpoint source pollutants.¹¹⁷ Furthermore, unlike Montana, Idaho and the EPA do not agree on acceptable criteria for temperature for Idaho water bodies. According the Idaho DEQ, the disagreement with EPA arises because:

[A]t issue is the balance between temperature that is protective of coldwater-dependent species yet attainable in most water bodies. Numerous studies and investigations have been conducted by DEQ and others to determine the impact of temperature on aquatic life in various water bodies. In April 2003, EPA Region 10 issued guidance to states and tribes in the Pacific Northwest on temperature criteria to protect endangered salmonids. Idaho participated in developing this guidance but in the end dissented on most of the recommended criteria due to reservations

116. Bull Trout Recovery and Monitoring Technical Group (RMEG), *Bull Trout Recovery: Monitoring and Evaluation Guidance*, U.S. FISH & WILDLIFE SERV. 74 (Feb. 2008), https://www.fws.gov/columbiariver/publications/080310_M&E_guidance_FINAL_2.pdf.

117. *Nonpoint Source Pollution*, IDAHO DEP'T OF ENVTL. QUALITY, <https://www.deq.idaho.gov/water-quality/surface-water/nonpoint-source-pollution.aspx> (last visited Apr. 12, 2020).

as to their attainability. These reservations persist to this day.¹¹⁸

Idaho first adopted bull trout temperature criteria in 1998. These criteria were revised in 2001 and submitted to EPA for approval in 2003. Under "the Alaska rule,"¹¹⁹ water quality standards revised after May 30, 2000 cannot be used for CWA purposes.¹²⁰ However, for this temperature standard alone, federally promulgated bull trout criteria were already in effect in Idaho.¹²¹

As a result, because the EPA has not taken action, Idaho takes the position that the bull trout temperature criterion effective for CWA purposes is the 1997 federally promulgated temperature criterion of 10 °C for seven-day average maximum daily temperatures from June through September for waters specified in the federal rule.¹²² As of the date of this writing, the status of EPA review remains "pending." Some waters identified in Idaho's 1996 *Bull Trout Conservation Plan* are not listed in 40 CFR 131.33. For these waters, the 1998 water quality criteria published by Idaho in its administrative code¹²³ continue to apply. These have been carried forward and applied in Idaho's 2016 Integrated Report.¹²⁴

Notwithstanding the lack of agreement with the EPA, Idaho DEQ has maintained its state water temperature criteria for TMDLs.¹²⁵ Idaho DEQ's current stream temperature standards protect aquatic life uses that have temperature requirement, specifically bull trout, comprising a subcategory of the cold-water aquatic life use. For all uses but bull trout, DEQ uses a pair of criteria that limits the daily maximum and daily average temperatures. However, for bull trout, the criterion is for a seven-day rolling average of daily maximums. This rolling average regulates high temperatures while allowing a few days to be slightly warmer.

118. *Temperature*, IDAHO DEP'T OF ENVTL. QUALITY, <https://www.deq.idaho.gov/water-quality/surface-water/temperature/> (last visited Apr. 12, 2020).

119. 40 C.F.R. 131.21 (2019).

120. *EPA Actions on Proposed Standards*, IDAHO DEP'T OF ENVTL. QUALITY, <http://www.deq.idaho.gov/epa-actions-on-proposed-standards> (last visited Apr. 12, 2020).

121. 40 C.F.R. 131.33.

122. *Id.*

123. Idaho Admin. Code r. 58.01.02 (2019).

124. *Idaho's 2016 Integrated Report*, IDAHO DEP'T OF ENVTL. QUALITY (Nov. 2018), <https://www.deq.idaho.gov/media/60182296/idaho-integrated-report-2016.pdf>.

125. Idaho Admin. Code r. 58.01.02.250–53.

The rule states:

Bull Trout Temperature Criteria. Water temperatures for the waters identified under [s]ubsection 250.02.g.i. shall not exceed thirteen degrees Celsius (13C) maximum weekly maximum temperature (MWMT) during June, July and August for juvenile bull trout rearing, and nine degrees Celsius (9C) daily average during September and October for bull trout spawning. For the purposes of measuring these criteria, the values shall be generated from a recording device with a minimum of six (6) evenly spaced measurements in a twenty-four (24) hour period. The MWMT is the mean of daily maximum water temperatures measured over the annual warmest consecutive seven (7) day period occurring during a given year.¹²⁶

There are several Idaho watersheds that rely on these DEQ standards to protect bull trout. One example is the Lemhi River subbasin,¹²⁷ where the Idaho DEQ has adopted temperature TMDLs.¹²⁸ As part of the original Lemhi River subbasin assessment, the Idaho DEQ detailed the tributary watersheds, providing descriptions of individual streams which included comprehensive biological and instream water quality data.¹²⁹ The subbasin assessment directly led to the Lemhi River Watershed TMDL.¹³⁰ While it did set forth TMDLs for sediment and bacteria, originally it did not address water temperature as a TMDL. Subsequently, in

126. Idaho Admin. Code r. 58.01.02.250(g).

127. *Idaho Hydrologic Unit Code (HUC)17060204*, IDAHO DEP'T OF ENVTL. QUALITY, <http://www2.deq.idaho.gov/water/BurpViewer/Burpsite/Location?BurpID=2004SIDFA070> (last visited Apr. 12, 2020).

128. The Lemhi River is located in east-central Idaho, southeast of the town of Salmon and lies entirely within Lemhi County. It flows northwest between the Lemhi Range and the Beaverhead Mountains until its confluence with the Salmon River near the town of Salmon, Idaho.

129. Idaho Div. of Env'tl. Quality, *Lemhi River Subbasin Assessment Summary: A Summary of the Assessment of Resource Conditions and Issues Within the Watersheds of the Lemhi River Valley*, Prepared for the Principal Working Group of the Lemhi County Riparian Conservation Agreement, Idaho Div. of Env'tl. Quality 130 (1998).

130. Idaho Div. of Env'tl. Quality, *Lemhi River Watershed TMDL: An Allocation of Nonpoint Source Pollutants in the Water Quality Limited Watershed of the Lemhi River Valley*, IDAHO DEP'T OF ENVTL. QUALITY 205 (Dec. 1999), https://www.deq.idaho.gov/media/454821-_water_data_reports_surface_water_tmdls_lemhi_river_lemhi_river_entire.pdf.

2014, the Idaho DEQ addressed temperature TMDL for the first time when it published its TMDL addendum.¹³¹ This summarized pertinent subbasin characteristics and any additional data that affect water quality and beneficial uses in the Lemhi River subbasin.

In sum, while different than Montana's approach, the Idaho DEQ framework provides bull trout a measure of protection from excessive water temperature. While it is unclear why Idaho does not list temperature as a nonpoint source pollutant, one could debate whether a NPDES permit system for temperature could ever be effective. Instead, the temperature TMDLs which Idaho DEQ has adopted and applied, as evidenced within the 2016 Integrated Report, should provide reasonable protection for bull trout in Idaho waters.

IV. CONCLUSION

The issue remains how to best use the ESA and CWA to protect bull trout from the effects of climate change. The problem does not persist from any lack of standards or low-quality standards within the federal statutes themselves. The ESA has led to the listing of hundreds of species, including some high-profile species, e.g. polar bear and corals, where climate change appeared as the principal factor for decline. "Best available science" continues to be the standard for ESA listing and consultation. As a result, agencies require increasing amounts of climate information and stream temperature analysis for their decisions. Likewise, the CWA contains a clear framework for categorizing waters according to water quality standards. These have resulted in TMDLs for most pollutants, including water temperature, which has become the most important TMDL for bull trout.

Montana and Idaho together contain the majority of the basins in the United States with bull trout core areas and ESA designated critical habitat. The USFWS has provided ESA Section 7 consultation for USFS forest planning for the vast national forest lands contained there. For CWA purposes, each state has taken a similar, although somewhat unique, approach to stream categorization, monitoring, and setting TMDLs for water temperature. Upon review, one can conclude that Montana and Idaho have taken very seriously the protection of bull trout from excessive water temperatures.

As this article was being finalized, the United States Court of Appeals for the Ninth Circuit ruled in a significant CWA case, centering on

131. *Idaho's 2012 Integrated Report*, IDAHO DEP'T OF ENVTL. QUALITY (Jan. 2014), <http://www.deq.idaho.gov/media/1117323/integrated-report-2012-final-entire.pdf>.

temperature TMDLs.¹³² The factual background appears somewhat complex, but essentially the plaintiff groups sued over inaction by the States of Washington and Oregon to achieve a water temperature TMDL for a portion of the Columbia River. Plaintiffs successfully argued that state inaction amounted to a constructive submission of no temperature TMDL. Such inaction, they reasoned, should trigger the EPA's nondiscretionary duty to approve or disapprove the TMDL. The court held that a constructive submission will be found where a state has failed over a long period of time to submit a water temperature TMDL, and clearly and unambiguously decided not to submit any TMDL. The court further held that where a state has failed to develop and issue a particular TMDL for a prolonged period of time and has failed to develop a schedule and credible plan for producing that TMDL, the state has no longer simply failed to prioritize this obligation. Instead, there has been a constructive submission of no TMDL, which triggers the EPA's mandatory duty to act.¹³³

Federal environmental laws, and specifically the ESA and CWA, will continue to provide protection for aquatic species in the face of global warming. Coldwater species, in particular, will always benefit from state and federal agency attention to the threats posed by increased water temperatures. Extinction is not an option.

132. *Columbia Riverkeeper v. Wheeler*, 944 F.3d 1204 (9th Cir. 2019).

133. As of this writing, it is unknown whether defendants will appeal the ruling.