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UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF CALIFORNIA

INSTITUTE FOR FISHERIES RESOURCES; and PACIFIC COAST FEDERATION OF FISHERMEN'S ASSOCIATIONS,

Plaintiffs,

v.

BRIDGESTONE AMERICAS, Inc.; CONTINENTAL TIRE THE AMERICAS, LLC; GITI TIRE (USA), Ltd.; THE GOODYEAR TIRE & RUBBER Co.; COOPER TIRE & RUBBER Co.; HANKOOK TIRE AMERICA Corp.; KUMHO TIRE U.S.A., Inc.; MICHELIN NORTH AMERICA, Inc.; NOKIAN TYRES; PIRELLI TIRE NORTH AMERICA; SUMITOMO RUBBER NORTH AMERICA, Inc.; TOYO TIRE HOLDINGS OF AMERICAS, Inc.; and YOKOHAMA TIRE Corp.

Defendants.

Case No. 3:23-cv-5748

COMPLAINT FOR DECLARATORY AND INJUNCTIVE RELIEF

INTRODUCTION

1. In this citizen suit brought under Section 9 of the Endangered Species Act ("ESA"), commercial fishing families and their coastal communities challenge the unlawful "take" of ESA-protected species of coho salmon (*Oncorhynchus kisutch*), steelhead trout (*Oncorhynchus mykiss*), and Chinook salmon (*Oncorhynchus tshawytscha*) caused by Defendant tire manufacturers' inclusion of N-(1,3-dimethylbutyl)-N'-phenyl-p-phenylenediamine ("6PPD") in the tires they manufacture and/or distribute. 16 U.S.C. §§ 1540(g); 1538(a)(1)(B), (G).

2. By design, the 6PPD that Defendants include in their tires transforms, at the surface of the tire or when released into the environment, into various other chemicals, including 6PPD-quinone or "6PPD-q."

3. 6PPD-q is one of the most toxic substances to aquatic species ever assessed, second only to the chemical war agent parathion. The presence of 6PPD-q in aquatic environments is profoundly harmful to a range of marine species, including coho salmon, steelhead trout, and Chinook salmon protected under the ESA. Coho salmon, steelhead trout, and Chinook salmon, and exposed to toxic concentrations of 6PPD-q often die within hours of exposure and/or are harmed by 6PPD-q's sublethal effects.

4. As a result of Defendants' products, 6PPD-q is now found in toxic concentrations in watersheds across the West Coast. Scientists have confirmed toxic concentrations of 6PPD-q in watersheds in San Francisco, Seattle, and Los Angeles.

5. The foreseeable discharge of 6PPD-q from tires into waterways harms, harasses, wounds, and kills ESA-protected populations of coho salmon, steelhead trout, and Chinook salmon, thereby "taking" these species in violation of Section 9 of the ESA.

6. Defendants' inclusion of 6PPD in their tires directly harms Plaintiffs, because the proliferation of 6PPD-q—and resulting die-offs of coho salmon, Chinook salmon, and other salmonids—has decimated the commercial salmon fishing industry in which many of their fishing family members make their livelihoods. In recent years, so few juvenile salmon have survived in California's rivers (many now polluted by 6PPD-q) that the State has been forced to

restrict access even to the most abundant fisheries and entirely suspend commercial salmon fishing for 2023.

7. Although Defendants have known about the devastating impacts of 6PPD-q for years, each of them has continued to include 6PPD in the tires that they manufacture and/or distribute. Plaintiffs therefore request that this Court declare that Defendants are in violation of the "take" prohibition of Section 9 of the ESA and order Defendants to cease that unlawful take.

JURISDICTION AND VENUE

8. This Court has jurisdiction over this action by virtue of 28 U.S.C. § 1331 (federal question jurisdiction), 28 U.S.C. § 2201 (declaratory judgment), 28 U.S.C. § 2202 (injunctive relief), 16 U.S.C. § 1540(c) (actions arising under the ESA), and 16 U.S.C. § 1540(g) (citizen suit provision of the ESA).

9. As required by 16 U.S.C. § 1540(g)(2)(A)(i), on August 15, 2023, Plaintiffs sent 60-days' notice of intent to sue on the ESA Section 9 (16 U.S.C. § 1538) violations alleged in this complaint to the Secretary of Commerce and to alleged violators listed herein. More than 60 days have elapsed since Defendants and the Secretary of Commerce received this notice. A copy of Plaintiffs' notice letter is attached hereto as Exhibit A.

10. Venue is proper under 28 U.S.C. § 1391(b)(2), (3) and 16 U.S.C. § 1540(g)(3), as Plaintiffs have members that reside and fish in California, including in this district, and substantial effects of Defendants' alleged take of protected fish species giving rise to Plaintiffs' claims have occurred and will continue to occur in this district.

DIVISIONAL ASSIGNMENT

11. Assignment to the San Francisco Division of this Court is proper, because a substantial part of the events and omissions giving rise to the claims herein occurred in counties assigned to the San Francisco Division.

PARTIES

PLAINTIFFS

12. Plaintiff Institute for Fisheries Resources ("IFR") is a 501(c)(3) nonprofit research and conservation organization headquartered in San Francisco, California. IFR's mission is to protect and preserve the fisheries along the West Coast, including the Pacific Northwest region. IFR has a regional office located in Eugene, Oregon.

13. IFR advocates for healthy fisheries by working directly with resource stakeholders, government agencies, and fishermen's associations. IFR conducts fishery research and analyzes coastal conservation, organizes the commercial fishing community around shared industry objectives, and educates the general public about the pressing need for protecting rivers, wetlands, estuaries, and coastal ecosystems which commercially fished species require for their survival.

14. IFR also leads restoration efforts in major salmon watersheds in northern California, southern Oregon, the Klamath River Basin, the San Francisco Bay's greater watershed, and the Columbia River/Snake River Basin, among other West Coast locations.

15. Plaintiff Pacific Coast Federation of Fishermen's Associations ("PCFFA") is by far the largest trade organization of commercial fishing families on the West Coast. It is a California non-profit 501(c)(5) trade association organized as a federation of 17 local and regional commercial fishing port associations, marketing associations, and type-of-vessel owner groups representing approximately 750 family commercial fishing businesses West Coast-wide, including primarily in California. PCFFA's individual members generally are small and mid-sized commercial fishing boat owners and operators, most of whom derive all or part of their income from the harvesting of Pacific salmon.

16. PCFFA has its headquarters in San Francisco, CA and has active member associations along most of the U.S. West Coast, including California ports from San Diego to Crescent City. Additionally, several of PCFFA's member groups are themselves coastwide associations with their own individual membership operating in many California and West Coast

ports. PCFFA also shares a Pacific Northwest regional office located in Eugene, Oregon, with IFR.

17. PCFFA uses lobbying, public education, and litigation to advocate on behalf of both commercial fish harvesters and the fishery resource itself in order to ensure the long-term survival of commercial fishing as a way of life. Much of this work involves efforts to protect and restore the ecological health of commercially fished species wherever they are threatened, and to ensure that our West Coast commercial fisheries (particularly salmon fisheries) are abundant, remain sustainable, and that the habitat which commercially fished species need for their survival is protected and, where previously damaged, restored.

18. PCFFA is a sister organization to IFR and serves as a "bridge" between trade-association represented fish harvesters and IFR's research and conservation efforts.

19. Both organizations' missions are frustrated by Defendants' use of 6PPD in tires because it causes prespawn mortality and harmful sublethal effects in salmonids. IFR and PCFFA both rely on the presence and abundance of salmonids to carry out their organizational missions and will continue to be harmed if Defendants continue unlawfully taking salmonids due to their use of 6PPD in tires.

20. The severe threat from Defendants' 6PPD-containing tires to Pacific salmonids requires IFR and PCFFA to divert their resources to engage directly with fish-dependent communities to help mitigate the harm from the absence of salmonids. This diversion of resources represents a further harm to IFR and PCFFA from Defendants' challenged actions.

21. Because 6PPD kills the salmonids upon which fish harvesters and their fish-dependent businesses and rural coastal communities rely, Defendants' unauthorized take has harmed, and will continue to cause harm to, individual members of PCFFA and IFR.

22. The financial and cultural interests of IFR, PCFFA, and their members (and the fishing-dependent communities those members live in) are severely impaired by the inclusion of 6PPD in tires. Members of PCFFA and IFR have a concrete economic as well as cultural interest in the survival and recovery of endangered and threatened salmonids, as they and their

communities depend on sustainably fishing for those salmonids for their livelihoods and wellbeing. They further have concrete cultural interests in the survival and recovery of endangered and threatened salmonids, as fishing cannot survive as a way of life in the absence of fish. Defendants' inclusion of 6PPD in tires is the direct, traceable cause of the harm that members of IFR and PCFFA are suffering and will suffer, because the inclusion of 6PPD in tires is causing or contributing to mass die-offs of dozens of stocks of the endangered and threatened salmonids on which the commercial fish harvesters IFR and PCFFA serve must rely.

23. The injuries IFR, PCFFA, and their members are suffering and will suffer are redressable by this Court, because this Court has the authority to enjoin Defendants' continued unlawful take of endangered and threatened salmonids.

DEFENDANTS

24. Defendants are thirteen of the largest tire manufacturers in the United States: Bridgestone Americas, Inc.; Continental Tire the Americas LLC; Giti Tire (USA) Ltd.; The Goodyear Tire & Rubber Company; Cooper Tire & Rubber Company; Hankook Tire America Corp.; Nokian Tyres; Kumho Tire U.S.A., Inc.; Michelin North America, Inc.; Pirelli Tire North America; Sumitomo Rubber North America, Inc.; Toyo Tire Holdings of Americas Inc.; and Yokohama Tire Corporation. Together, their tires make up approximately 80% of the domestic United States tire market.

25. Defendant Bridgestone Americas, Inc., is headquartered in Nashville, Tennessee, and is the North American subsidiary of Bridgestone Corporation, the world's largest tire and rubber company. Bridgestone Corporation acquired Firestone Tire and Rubber Company in 1988 as a subsidiary. Bridgestone Americas, Inc., and its subsidiaries develop, manufacture and market a wide range of Bridgestone, Firestone, and associate brand tires for passenger, light truck, commercial truck and bus, agricultural, motorcycle, kart, and off-the-road vehicles. Bridgestone Americas, Inc., is registered to do business in California. Bridgestone Americas, Inc., has a registered agent in California. Bridgestone Americas, Inc., was formerly known as,

did or does business as, and/or is the successor in liability to Bridgestone Firestone North American Holdings Ltd. and Bridgestone Americas Tire Operations, LLC.

26. Bridgestone Americas, Inc., manufactures tires containing 6PPD. Bridgestone Americas, Inc., distributes tires containing 6PPD across the United States. Bridgestone Americas, Inc., distributes tires containing 6PPD in California. All of the tires that Bridgestone Americas, Inc., manufactures contain 6PPD. All of the tires that Bridgestone Americas, Inc., distributes contain 6PPD. All of the tires that the subsidiaries of Bridgestone Americas, Inc., manufacture contain 6PPD. All of the tires that the subsidiaries of Bridgestone Americas, Inc., distribute contain 6PPD.

27. Continental Tire the Americas, LLC, is the North American subsidiary of Continental AG, a German multinational manufacturing corporation that produces various parts for the automotive and transportation industries, including tires. Continental Tire the Americas, LLC, was founded in 1983 and is headquartered in Fort Mill, South Carolina. Continental Tire the Americas, LLC, is registered to do business in California. Continental Tire the Americas, LLC, has a registered business agent in California. Continental Tire the Americas, LLC, is one part of various subsidiaries owned by Continental AG and may formerly be, or is known as doing or did business as, General Tire.

28. Continental Tire the Americas, LLC, manufactures tires containing 6PPD. Continental Tire the Americas, LLC, distributes tires containing 6PPD across the United States. Continental Tire the Americas, LLC, distributes tires containing 6PPD in California. All of the tires that Continental Tire the Americas, LLC, manufactures contain 6PPD. All of the tires that Continental Tire the Americas, LLC, distributes contain 6PPD. All of the tires that General Tire manufactures contain 6PPD. All of the tires that General Tire distributes contain 6PPD.

29. Giti Tire (USA) Ltd. is the United States subsidiary of the Singapore-based, global tire manufacturing company Giti Tire Pte. Ltd. Giti Tire (USA) Ltd. manufactures and distributes passenger and commercial vehicle tires. Giti Tire (USA) Ltd. is headquartered in

Rancho Cucamonga, California. Giti Tire (USA) Ltd. is registered to do business in California. Giti Tire USA has a registered agent in California.

30. Giti Tire (USA) Ltd. manufactures tires containing 6PPD. Giti Tire (USA) Ltd. distributes tires containing 6PPD across the United States. Giti Tire (USA) Ltd. distributes tires containing 6PPD in California. All of the tires that Giti Tire (USA) Ltd. manufactures contain 6PPD. All of the tires that Giti Tire (USA) Ltd. distributes contain 6PPD. All of the tires that the subsidiaries of Giti Tire (USA) Ltd. manufacture contain 6PPD. All of the tires that the subsidiaries of Giti Tire (USA) Ltd. distribute contain 6PPD.

31. The Goodyear Tire & Rubber Company is an American global tire company headquartered in Akron, Ohio. The Goodyear Tire & Rubber Company manufactures several kinds of tires, including passenger, commercial, off-the-road, racing, and aircraft tires. The Goodyear Tire & Rubber Company is registered to do business in California. The Goodyear Tire & Rubber Company has a registered agent in California. The Goodyear Tire & Rubber Company may formerly be, or is, known as, doing or did business as Dunlop Tyres, The Kelly Springfield Tire Company, Cooper Tire & Rubber Co., and Douglas Tires.

32. The Goodyear Tire & Rubber Company manufactures tires containing 6PPD. The Goodyear Tire & Rubber Company distributes tires containing 6PPD across the United States. The Goodyear Tire & Rubber Company distributes tires containing 6PPD in California. All of the tires that The Goodyear Tire & Rubber Company manufactures contain 6PPD. All of the tires that The Goodyear Tire & Rubber Company distributes contain 6PPD. All of the tires that the subsidiaries of The Goodyear Tire & Rubber Company manufacture contain 6PPD. All of the tires that the subsidiaries of The Goodyear Tire & Rubber Company distribute contain 6PPD.

33. Cooper Tire & Rubber Company is a subsidiary of The Goodyear Tire & Rubber Company, acquired in June 2021. Cooper Tire & Rubber Company is headquartered in Findlay, Ohio, and manufactures both new and replacement tires for passenger cars, light trucks, and sport utility cars. Cooper Tire & Rubber Company itself has many subsidiaries, both nationally and internationally. Cooper Tire & Rubber Company may formerly be, or is, known as, doing or

did business as Avon Tyres, Mastercraft Tires, Mickey Thompson Tires & Wheels, Roadmaster Tires, Dean Tires, and StarFire Tires.

34. Cooper Tire & Rubber Company manufactures tires containing 6PPD. Cooper Tire & Rubber Company distributes tires containing 6PPD across the United States. Cooper Tire & Rubber Company distributes tires containing 6PPD in California. All of the tires that Cooper Tire & Rubber Company manufactures contain 6PPD. All of the tires that Cooper Tire & Rubber Company distributes contain 6PPD. All of the tires that the subsidiaries of Cooper Tire & Rubber Company manufacture contain 6PPD. All of the tires that the subsidiaries of Cooper Tire & Rubber Company distribute contain 6PPD.

35. Hankook Tire America Corp. is the American subsidiary of the South Korean tire manufacturing company Hankook Tire & Technology Co., Ltd. Hankook Tire America Corp. is headquartered in Nashville, Tennessee. Hankook Tire America Corp. manufactures and distributes passenger, light truck, SUV, medium truck, and bus tires. Hankook Tire America Corp. is registered to do business in California. Hankook Tire America Corp. has a registered agent in California.

36. Hankook Tire America Corp. manufactures tires containing 6PPD. Hankook Tire America Corp. distributes tires containing 6PPD across the United States. Hankook Tire America Corp. distributes tires containing 6PPD in California. All of the tires that Hankook Tire America Corp. manufactures contain 6PPD. All of the tires that Hankook Tire America Corp. distributes contain 6PPD.

37. Nokian Tyres is the North American subsidiary of Finnish tire manufacturer Nokian Tyres. Nokian Tyres is headquartered in Nashville, Tennessee. Nokian Tyres opened a production plant in 2020 in Dayton, Tennessee. That plant manufactures passenger, SUV, and light truck tires. The plant produces approximately 4 million tires a year. Nokian Tyres may formerly be, or is, known as, doing or did business as Nokian Tyres US Operations.

38. Nokian Tyres manufactures tires containing 6PPD. Nokian Tyres distributes tires containing 6PPD across the United States. Nokian Tyres distributes tires containing 6PPD in

California. All of the tires that Nokian Tyres manufactures contain 6PPD. All of the tires that Nokian Tyres distributes contain 6PPD.

39. Kumho Tire U.S.A., Inc., is the United States sales, marketing, product development, and distribution subsidiary of South Korean tire manufacturing company Kumho Tire Co., Inc. Kumho Tire U.S.A., Inc., is headquartered in Atlanta, Georgia. Kumho Tire U.S.A., Inc., manufactures passenger, commercial, and light truck tires including new and replacement tires. Kumho Tire U.S.A., Inc., is registered to do business in California. Kumho Tire U.S.A., Inc., has a registered agent in California.

40. Kumho Tire U.S.A., Inc., manufactures tires containing 6PPD. Kumho Tire U.S.A., Inc., distributes tires containing 6PPD across the United States. Kumho Tire U.S.A., Inc., distributes tires containing 6PPD in California. All of the tires that Kumho Tire U.S.A., Inc., manufactures contain 6PPD. All of the tires that Kumho Tire U.S.A., Inc., distributes contain 6PPD.

41. Michelin North America, Inc., is the United States subsidiary of French multinational tire manufacturer Michelin. Michelin North America, Inc., is headquartered in Greenville, South Carolina. Michelin North America, Inc., manufactures almost every kind of tire. Michelin North America, Inc., operates 20 major manufacturing plants. Michelin North America, Inc., is registered to do business in California. Michelin North America, Inc., has a registered agent in California. Michelin North America, Inc., may formerly be, or is, known as, doing or did business as BF Goodrich and/or Uniroyal Tire Company.

42. Michelin North America, Inc., manufactures tires containing 6PPD. Michelin North America, Inc., distributes tires containing 6PPD across the United States. Michelin North America, Inc., distributes tires containing 6PPD in California. All of the tires that Michelin North America, Inc., manufactures contain 6PPD. All of the tires that Michelin North America, Inc., distributes contain 6PPD. All of the tires that the subsidiaries of Michelin North America, Inc., manufacture contain 6PPD. All of the tires that the subsidiaries of Michelin North America, Inc., distribute contain 6PPD.

43. Pirelli Tire North America is the North American subsidiary of Italian tire manufacturer Pirelli & C. S.P.A. Pirelli Tire North America's headquarters are in Rome, Georgia. Pirelli Tire North America manufactures new and replacement tires for passenger vehicles, SUVs, and light trucks. Pirelli Tire LLC is registered to do business in California. Pirelli Tire LLC has a registered agent in California. Pirelli Tire North America may formerly be, or is, known as, doing or did business as Pirelli Tire LLC.

44. Pirelli Tire North America manufactures tires containing 6PPD. Pirelli Tire North America distributes tires containing 6PPD across the United States. Pirelli Tire North America distributes tires containing 6PPD in California. All of the tires that Pirelli Tire North America manufactures contain 6PPD. All of the tires that Pirelli Tire North America distributes contain 6PPD.

45. Sumitomo Rubber North America, Inc., is a subsidiary of Sumitomo Rubber Industries USA, Inc., the North American subsidiary of the Japanese company Sumitomo Rubber Industries. Sumitomo Rubber North America, Inc., is headquartered in Rancho Cucamonga, California. Sumitomo Rubber North America, Inc., is the sales, marketing, and logistics arm of Sumitomo Rubber Industries USA, Inc. Sumitomo Rubber North America, Inc., is registered to do business in California. Sumitomo Rubber North America, Inc. is formally known as Falken Tire Corporation. Sumitomo Rubber North America, Inc., has a registered agent in California. Sumitomo Rubber USA, LLC, is also a subsidiary of Sumitomo Rubber Industries USA, Inc. Sumitomo Rubber USA, LLC, is the manufacturing and research and development arm of Sumitomo Rubber Industries USA Inc. Sumitomo Rubber USA, LLC, is headquartered in Tonawanda, New York. Sumitomo Rubber USA, LLC, is registered to do business in California. Sumitomo Rubber USA, LLC, has a registered agent in California. Sumitomo Rubber Industries USA Inc., produces over 4 million tires per year for the United States. Sumitomo Rubber Industries USA, Inc., manufactures tires for passenger vehicles, trucks, buses, and motorcycles. Sumitomo Rubber Industries USA, Inc., may formerly be, or is, known as, doing or did business

as Sumitomo Rubber North America, Inc., Sumitomo Rubber USA, LLC, Falken Tires, Goodyear Dunlop Tires North America, Ltd., and/or Dunlop Motorcycle Tires.

46. Sumitomo Rubber Industries USA, Inc., manufactures tires containing 6PPD. Sumitomo Rubber North America, Inc., distributes tires containing 6PPD across the United States. Sumitomo Rubber Industries USA, Inc., distributes tires containing 6PPD in California. All of the tires that Sumitomo Rubber Industries USA, Inc., manufactures contain 6PPD. All of the tires that Sumitomo Rubber North America, Inc., distributes contain 6PPD. All of the tires that the subsidiaries of Sumitomo Rubber Industries USA, Inc., manufacture contain 6PPD. All of the tires that the subsidiaries of Sumitomo Rubber North America, Inc., distribute contain 6PPD.

47. Toyo Tire Holdings of Americas, Inc., is the wholly owned American subsidiary of Japanese tire manufacturing company Toyo Tire Corporation of Osaka, Japan. Toyo Tire Holding of Americas, Inc., is headquartered in California. Toyo Tire Holding of Americas, Inc., manufactures passenger, all-season, off-road, light truck, and heavy-duty truck tires. Toyo Tire Holdings of America, Inc., is registered to do business in California. Toyo Tire Holdings of America, Inc., has a registered agent in California. Toyo Tire Holdings of America, Inc., may formerly be, or is, known as, doing or did business as Toyo Tire U.S.A. Corp., Nitto Tire U.S.A. Inc., Toyo Tire North America Manufacturing Inc., Toyo Tire North America OE Sales LLC, Toyo Automotive Parts (USA), Inc., and/or TMM (USA), Inc.

48. Toyo Tire Holdings of Americas, Inc., manufactures tires containing 6PPD. Toyo Tire Holdings of Americas, Inc., distributes tires containing 6PPD across the United States. Toyo Tire Holdings of Americas, Inc., distributes tires containing 6PPD in California. All of the tires that Toyo Tire Holdings of Americas, Inc., manufactures contain 6PPD. All of the tires that Toyo Tire Holdings of Americas, Inc., distributes contain 6PPD. All of the tires that the subsidiaries of Toyo Tire Holdings of Americas, Inc., manufacture contain 6PPD. All of the tires that the subsidiaries of Toyo Tire Holdings of Americas, Inc., distribute contain 6PPD.

49. Yokohama Tire Corporation is the North American manufacturing and marketing arm of Japanese rubber company The Yokohama Rubber Co., Ltd. Yokohama Tire Corporation manufactures various kinds of tires such as high-performance tires, passenger tires, off-road, bus, and truck tires. Yokohama Tire Corporation is headquartered in California. Yokohama Tire Corporation is registered to do business in California. Yokohama Tire Corporation has a registered agent in California. Yokohama Tire Corporation may formerly be, or is, known as, doing or did business as Yokohama Tire Manufacturing Virginia, LLC, Yokohama Tire Manufacturing Mississippi, LLC, Yokohama TWS North America, Inc. Spartanburg Plant, Yokohama TWS North America, Inc. Charles City Plant, Yokohama Corporation of North America, and/or Yokohama Off-Highway Tires America, Inc.

50. Yokohama Tire Corporation manufactures tires containing 6PPD. Yokohama Tire Corporation distributes tires containing 6PPD across the United States. Yokohama Tire Corporation distributes tires containing 6PPD in California. All of the tires that Yokohama Tire Corporation manufactures contain 6PPD. All of the tires that Yokohama Tire Corporation distributes contain 6PPD. All of the tires that the subsidiaries of Yokohama Tire Corporation manufacture contain 6PPD. All of the tires that the subsidiaries of Yokohama Tire Corporation distribute contain 6PPD.

LEGAL BACKGROUND

51. The ESA is "the most comprehensive legislation for the preservation of endangered species ever enacted by any nation." *Tenn. Valley Auth. v. Hill*, 437 U.S. 153, 180 (1978). The ESA was enacted to forestall the extinction of species, "whatever the cost," *id.* at 184, and to allow species to recover to the point where the protections afforded by the ESA are no longer necessary.

52. To accomplish these goals, the ESA includes a variety of substantive and procedural protections for species listed as endangered or threatened pursuant to the Act's terms.

53. A species is considered and listed as "endangered" when it "is in danger of extinction throughout all or a significant portion of its range," 16 U.S.C. § 1532(6), while a

species is "threatened" when it is "likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range." *Id.* § 1532(20); *see also id.* § 1533(c).

54. Section 9 of the ESA prohibits "take" of endangered species. 16 U.S.C. § 1538(a)(1)(B).

55. The take prohibition makes it unlawful for any person to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect" an individual of a protected species. 16 U.S.C. § 1532(19).

56. The ESA defines a "person" as "an individual, corporation, partnership, trust, association, or any other private entity[.]" 16 U.S.C. § 1532(13).

57. Under Section 4(d) of the ESA, the National Marine Fisheries Service ("NMFS") can extend the take prohibition to "threatened" species under the agency's jurisdiction by regulation, 16 U.S.C. § 1533(d), and it has done so here for threatened populations of coho, Chinook, and steelhead.

58. As part of its 4(d) rules for threatened salmon and steelhead, NMFS specifically considers that "discharges or dumping of toxic chemicals or other pollutants (e.g., sewage, oil, gasoline) into waters or riparian areas supporting listed [entities]" may violate the Section 9 take prohibition. 70 Fed. Reg. 37,160 (June 28, 2005); *see also* 73 Fed. Reg. 55,451 (Sept. 25, 2008); 65 Fed. Reg. 42,422 (July 10, 2000).

59. A person who conducts an otherwise lawful activity that may result in take may seek exemption from liability under the ESA by applying for an incidental take permit under Section 10(a)(1) of the ESA. 16 U.S.C. § 1539(a)(1)(B).

60. To obtain an incidental take permit to take listed coho, Chinook, or steelhead, an applicant must submit a "conservation plan" to NMFS. 16 U.S.C. § 1539(a)(2). Such conservation plan must, among other things, specify the impact that will likely result from any taking and the steps the applicant will take to minimize and mitigate such take and to ensure adequate funding for the plan. *Id.* After receiving an application and conservation plan, and after public review and comment, NMFS may issue an incidental take permit so long as "(i) the taking

will be incidental; (ii) the applicant will, to the maximum extent practicable, minimize and mitigate the impacts of such taking; (iii) the applicant will ensure that adequate funding for the plan will be provided; (iv) the taking will not appreciably reduce the likelihood of the survival and recovery of the species in the wild; and (v) the measures, if any, required . . . will be met." *Id.* § 1539(a)(2)(B).

FACTUAL BACKGROUND

I. COHO SALMON, CHINOOK, AND STEELHEAD TROUT

61. Coho salmon, Chinook salmon, and steelhead trout have immense ecological, economic, and cultural significance on the West Coast.

62. Coho salmon range throughout the northern Pacific Ocean, from central California to Alaska, and have a patched presence in east Asian waters around Japan. Coho spawn in freshwater streams and up rivers throughout their habitat.

63. Chinook salmon are both the largest and the least abundant of Pacific salmon and range from the San Joaquin River, California, to Alaska on the North American coast. Chinook salmon usually grow to 30 pounds and can travel as far as 1,000 miles upriver to spawn in freshwater.

64. Steelhead trout are the ocean-going variant of rainbow trout. Historically, steelhead trout ranged from the Bristol Bay area in Alaska to Baja California, but their range is shrinking and currently extends from Cold Bay on the Alaska Peninsula to central California. In natural conditions, steelhead trout can spawn in freshwater more than once. Steelhead, while not typically part of ocean commercial salmonid harvests, are important for supporting inland recreational fisheries, but also use most of the same river habitats as coho and Chinook, and therefore whatever benefits (or harms) steelhead likewise benefits (or harms) coho and Chinook.

65. Coho salmon, Chinook salmon, and steelhead trout return to their natal streams to spawn. The salmonids' homing instinct acts, in part, through their sense of smell and other magnetic functions.

66. Once coho salmon and Chinook salmon spawn, they die. Their single-spawn nature requires healthy waters for successful nests, known as "redds." If that single spawn is unsuccessful or hampered, it can negatively affect an entire generation.

67. Steelhead trout, by contrast, can sometimes spawn more than once, resulting in repeated exposures to pollutants in their spawning habitat. The survival rate of steelhead to re-spawn is generally less than 10%.

II. ESA-PROTECTED SALMONIDS

68. Salmon and steelhead populations were once abundant on the West Coast of the United States but have since markedly declined, with only approximately 2% of historic populations of wild salmon and steelhead remaining.

69. As a result of this decline, many populations of coho salmon, Chinook salmon, and steelhead are now listed as threatened or endangered under the ESA. For ESA-listing purposes, NMFS has administratively grouped steelhead and salmon populations into distinct population segments ("DPSs") (steelhead) or "evolutionary significant units ("ESUs") (coho salmon and Chinook salmon). Each "evolutionarily significant unit" or "distinct population segment" of these species is itself considered a "species" under the ESA. *See* 16 U.S.C. § 1532(16) (defining "species" under the ESA as including "any distinct population segment of any species of vertebrate fish . . . which interbreeds when mature"). Today, twenty-four populations of coho salmon, Chinook salmon, and steelhead are now listed as threatened or endangered species under the ESA.

70. These ESA-protected populations include:

(a) The Central California Coast Coho ESU (endangered), which includes all naturally spawned populations of coho salmon from Punta Gorda in northern California south to and including the San Lorenzo River in central California, as well as populations in tributaries to San Francisco Bay, excluding the Sacramento-San Joaquin River system;

(b) The Lower Columbia River Coho ESU (threatened), which includes all naturally spawned populations of coho salmon in the Columbia River and its tributaries from the mouth of the Columbia up to and including the Big White Salmon and Hood Rivers, and includes the Willamette River to Willamette Falls, Oregon;

(c) The Oregon Coast Coho ESU (threatened), which includes naturally spawned coho salmon originating from coastal rivers south of the Columbia River and north of Cape Blanco as well as coho salmon from the Cow Creek Hatchery Program;

(d) The Southern Oregon/Northern California Coho ESU (threatened), which includes all naturally spawned populations of coho salmon in coastal streams between Cape Blanco, Oregon and Punta Gorda, California, as well as coho salmon produced by three artificial propagation programs: Cole Rivers Hatchery, Trinity River Hatchery, and Iron Gate Hatchery;

(e) The Central Valley Spring-run Chinook ESU (threatened), which includes all naturally spawned populations of Central Valley spring-run Chinook salmon in the Sacramento River and its tributaries, including the Feather River;

(f) The California Coast Chinook ESU (threatened), which includes all naturally spawned populations of Chinook salmon from rivers and streams south of the Klamath River (Humboldt County, CA) to the Russian River (Sonoma County, CA);

(g) The Lower Columbia River Chinook ESU (threatened), which includes Chinook from 17 artificial propagation programs as well as all naturally spawned populations of Chinook salmon from the Columbia River and its tributaries from the river's mouth at the Pacific Ocean upstream to and including the Hood River in Oregon and the White Salmon River in Washington, including the Willamette River to Willamette Falls, Oregon, but excluding spring-run Chinook salmon in the Clackamas River;

(h) The Snake River Spring/Summer-Run Chinook ESU (threatened), which includes all naturally spawned spring/summer Chinook salmon originating from the mainstem Snake River and the Tucannon River, Grande Ronde River, Imnaha River, and Salmon River subbasins;

(i) The Snake River Fall-Run Chinook ESU (threatened), which contains Chinook salmon from four artificial propagation programs as well as all natural-origin fall Chinook salmon originating from the lower Snake River below Hells Canyon Dam and from the Tucannon River, Grande Ronde River, Imnaha River, Salmon River, and Clearwater River subbasins;

(j) The Sacramento River Winter-Run Chinook ESU (endangered), which includes winter-run Chinook salmon spawning naturally in the Sacramento River and its tributaries, as well as winter-run Chinook salmon that are part of the conservation hatchery program at the Livingston Stone National Fish Hatchery;

(k) The Puget Sound Chinook ESU (threatened), which includes both naturally spawning and hatchery Chinook salmon in a boundary extending from the Nooksack River in the North to southern Puget Sound, includes Hood Canal, and extends westerly out of the Strait of Juan de Fuca to the Elwha River;

(l) The Upper Willamette River Chinook ESU (threatened), which includes all naturally spawned populations of spring Chinook salmon in the Clackamas River and in the Willamette Basin upstream of Willamette Falls, as well as six artificial propagation programs;

(m) The Upper Columbia River Spring-Run Chinook ESU (endangered), which includes both naturally spawned and artificially propagated salmon in the Columbia River and its tributaries between Rock Island Dam and Chief Joseph Dam;

(n) The Southern California Steelhead DPS (endangered), which includes all naturally spawned populations of steelhead in streams from the Santa Maria River, San Luis Obispo County, California (inclusive) to the U.S.-Mexico Border;

(o) The South-Central California Coast Steelhead DPS (threatened), which includes all naturally spawned populations of steelhead in streams from the Pajaro River (inclusive) to, but not including the Santa Maria River, California;

(p) The California Central Valley Steelhead DPS (threatened), which includes all naturally spawned populations of steelhead in the Sacramento and San Joaquin Rivers and their tributaries, excluding steelhead from San Francisco and San Pablo Bays and their tributaries;

(q) The Central California Coast Steelhead DPS (threatened), which includes all naturally spawned populations of steelhead in coastal streams from the Russian River (inclusive) to Aptos Creek (inclusive), and the drainages of San Francisco, San Pablo, and Suisun Bays eastward to Chipps Island at the confluence of the Sacramento and San Joaquin Rivers; and tributary streams to Suisun Marsh including Suisun Creek, Green Valley Creek, and an unnamed tributary to Cordelia Slough, exclusive of the Sacramento-San Joaquin River Basin of the California Central Valley;

(r) The Northern California Steelhead DPS (threatened), which includes all naturally spawned populations of steelhead in California coastal river basins from Redwood Creek southward to, but not including, the Russian River;

(s) The Lower Columbia Steelhead DPS (threatened), which includes all naturally spawned populations of steelhead in streams and tributaries to the Columbia River between the Cowlitz and Wind Rivers, Washington (inclusive), and the Willamette and Hood Rivers, Oregon (inclusive), and excludes steelhead in the upper Willamette River Basin above Willamette Falls and steelhead from the Little and Big White Salmon Rivers in Washington;

(t) The Middle Columbia River Steelhead DPS (threatened), which includes all naturally spawned populations of steelhead in streams from above the Wind River, Washington, and the Hood River, Oregon (exclusive), upstream to, and including, the Yakima River, Washington, excluding steelhead from the Snake River Basin;

(u) The Puget Sound Steelhead DPS (threatened), which includes all naturally spawned steelhead originating below natural and manmade impassable barriers in rivers flowing into Puget Sound from the Elwha River (inclusive) eastward, including rivers in Hood Canal, South Sound, North Sound, and the Strait of Georgia;

(v) The Snake River Basin Steelhead DPS (threatened), which includes all naturally spawned populations of steelhead in streams in the Snake River Basin of southeast Washington, northeast Oregon, and Idaho;

(w) The Upper Columbia River Steelhead DPS (threatened), which includes all naturally spawned populations of steelhead in streams in the Columbia River Basin upstream from the Yakima River, Washington, to the U.S.-Canada border;

(x) The Upper Willamette River Steelhead DPS (threatened), which includes all naturally spawned populations of winter-run steelhead in the Willamette River, Oregon, and its tributaries upstream from Willamette Falls to the Calapooia River (inclusive).

71. NMFS has identified stormwater runoff as a significant factor contributing to the decline of each of these 24 populations. This stormwater runoff contains 6PPD-q.

III. 6PPD-Q IN AQUATIC ENVIRONMENTS

72. Tire manufacturers began using 6PPD in the 1950s and 1960s to prevent tire cracking. 6PPD is a tire additive that migrates (or "blooms") to the surface of the tire upon use. On the surface of tires, 6PPD reacts with ozone and oxygen, creating several transformation

products, including 6PPD-q. As such, the total concentration of 6PPD in the tire decreases over the life of the tire.

73. Defendants include 6PPD in all tires they manufacture and/or distribute.

74. As vehicles drive and park on hard surfaces such as streets, roads, highways, parking lots, and alleys, 6PPD and 6PPD-q is released onto the hard surfaces.

75. During rain and snowmelt events, runoff transports 6PPD and 6PPD-q into aquatic environments from these hard surfaces.

76. Since the 1980s, scientists observed coho salmon in freshwater environments exhibiting symptoms of acute toxic poisoning: swimming in circles, mouth gaping, loss of equilibrium, disorientation, before the death of an otherwise healthy adult coho, prior to spawning. Scientists dubbed this phenomenon "Urban Runoff Mortality Syndrome."

77. By 2012, scientists identified the positive correlation between stormwater runoff and coho mortality.

78. In the Puget Sound region, coho mortality connected to stormwater exposure was observed repeatedly over decades and often annually in highly-urbanized streams.

79. In 2020, researchers isolated and identified the chemical that was causing this prespawn mortality in coho salmon: 6PPD-q, the transformation product of the chemical 6PPD.

80. Scientists have concluded that the source of 6PPD-q in aquatic environments is from tires.

81. Coho, steelhead, and Chinook salmonids that are exposed to toxic concentrations of 6PPD-q all display symptoms of Urban Runoff Mortality Syndrome: spiraling and other erratic movements, permanent loss of equilibrium, gaping on the water surface, and—within a few hours—death.

82. Once symptoms of 6PPD-q exposure begin, fish do not recover even when transferred to clean water.

83. For coho salmon, the lethal concentration of 6PPD-q required to kill 50% of test animals ("LC_{50}") is estimated to be between 41 to 95 nanograms per liter ("ng/L") (or .041–.095

micrograms per liter ("µg/L")). This toxicity level suggests that 6PPD-q is among the most toxic chemicals known for aquatic organisms, at least to coho salmon. In one experiment where juvenile coho salmon were exposed for 24 hours to untreated urban runoff, the fish started dying within just 2 to 4 hours, with 90% dying within 1 to 2 days of exposure. Even when this urban runoff was diluted 95% with clean water, exposure to the diluted stormwater was generally lethal to coho.

84. 6PPD-q is also acutely toxic to both rainbow and steelhead trout. The LC_{50} for rainbow trout exposed to 6PPD-q is estimated to be 1.00 µg/L after 72 to 96 hours. Scientists believe the life history differences between rainbow trout and steelhead trout (i.e., freshwater residence vs. ocean migration) is not a determinant of susceptibility to 6PPD-q, meaning steelhead trout are likely to experience similar levels of mortality. When exposed to untreated stormwater runoff from three different storms, steelhead trout experienced 4% to 42% mortality and generally died within 1 to 2 days of exposure.

85. Chinook salmon are also vulnerable to 6PPD-q exposure. The LC_{50} value has not been precisely determined, but the LC_{25} estimate for juvenile Chinook salmon exposed to 6PPD-q is 43,699 ng/L (43.699 µg/L). When exposed to untreated stormwater runoff, Chinook suffer up to 13% mortality and generally died within 1 to 2 days of exposure. There are likely sublethal effects for Chinook salmon from exposure to 6PPD-q.

86. All three salmonid species are at risk of harm from exposure to 6PPD-q, because anadromous salmonids swim up and inland to reach their natal streams, where they are necessarily exposed to stormwater containing 6PPD-q both during migration and at their spawning destinations.

87. The presence of 6PPD-q in aquatic habitats has had, and will continue to have, large-scale impacts on ESA-protected coho, steelhead, and Chinook populations. Researchers have determined that wild coho populations cannot withstand the high rates of mortality that are now regularly occurring in urban spawning habitats, and that it will be difficult, if not impossible to reverse historical coho declines without addressing the toxic pollution dimension of freshwater

habitats. California's Department of Toxic Substances Control ("DTSC") has linked a 70 percent decline in coho in the San Francisco Bay Area between the 1960s and 1990s to the use of 6PPD in tires. DTSC has concluded that the presence of 6PPD-q in California's waterways continues to threaten the state's remaining coho salmon populations and may jeopardize the recovery of this species.

88. The toxicity of 6PPD-q likely also has ripple effects across the food chain. 6PPD-q is also acutely toxic to brook trout, mussels, and various crustacean species. And well over a hundred other species depend on salmon and steelhead for food, including other ESA-protected species such as southern resident killer whales that rely on Chinook salmon as their primary prey.

89. 6PPD-q's toxicity to numerous other species—including humans—has yet to be studied extensively. One recent study, however, has shown that 6PPD-q can cross the placenta blood barrier and enter the developing embryo and brain, raising risk of developmental abnormalities or birth defects.

90. 6PPD-q is ubiquitous in urban runoff and surface waters. It has been repeatedly confirmed in toxic concentrations across the globe. 6PPD-q has been detected in Los Angeles region roadway runoff at 4.1 to 6.1 µg/L; in San Francisco region creeks at 1.0 to 3.5 µg/L; and in Seattle-region watersheds from .3 to 3.2 µg/L. These concentrations are acutely lethal to coho and steelhead and cause sublethal harm to coho, steelhead, and Chinook.

91. Current stormwater management practices are nonexistent to insufficient to remove 6PPD-q from hard surfaces and stormwater runoff or to prevent it from entering aquatic environments. No state currently regulates the presence of 6PPD or 6PPD-q in stormwater.

92. Defendants add 6PPD to their tires. The 6PPD in Defendants' tires is designed to produce 6PPD-q which sheds from tires onto hard surfaces. This 6PPD-q is transported into aquatic environments in stormwater runoff, where it harms, harasses, wounds, and kills coho salmon, Chinook salmon, and steelhead trout.

93. For all of these reasons, it is foreseeable that Defendants' manufacture and/or distribution of tires containing 6PPD will introduce 6PPD-q into aquatic environments where it will harm, harass, wound, and kill coho salmon, Chinook salmon, and steelhead trout.

94. Defendants' manufacture and/or distribution of tires containing 6PPD therefore "takes" ESA-listed coho salmon, Chinook salmon, and steelhead trout within the meaning of Section 9 of the ESA, 16 U.S.C. §§ 1538(a)(1)(B), (G); 1532(19).

95. No Defendant has a permit under ESA Section 10, 16 U.S.C. § 1539(a), to lawfully incidentally "take" ESA-listed coho salmon, Chinook salmon, or steelhead trout.

96. On August 15, 2023, Plaintiffs sent a Notice letter to Defendants requesting immediate action to remedy Defendants' past and ongoing violations of the ESA resulting from continued take of ESA-listed fish species. These Notice letters constituted formal notice of intent to initiate litigation under the citizen suit provision of the ESA. *See* 16 U.S.C. § 1540(g)(2).

97. To date, Defendants have not ceased their unauthorized take of coho salmon, Chinook salmon, or steelhead trout.

CLAIM FOR RELIEF
VIOLATION OF SECTION 9 OF THE ESA

98. Plaintiffs hereby reallege each and every allegation contained in the preceding paragraphs of this Complaint.

99. Section 9 of the ESA prohibits the unpermitted "take" of ESA-listed coho salmon, Chinook salmon, and steelhead trout, 16 U.S.C. § 1538(a)(1)(B), (G).

100. NMFS has extended take protection to cover all threatened species of coho salmon, Chinook salmon, and steelhead trout.

101. Defendants' manufacturing and/or distribution of tires containing 6PPD has caused, and is continuing to cause, the take of ESA-protected coho salmon, Chinook salmon, and steelhead trout.

102. The unlawful take of coho salmon, Chinook salmon, and steelhead trout are the direct, foreseeable consequences of Defendants' inclusion of 6PPD in tires placed by Defendants into the stream of commerce.

103. Defendants' inclusion of 6PPD in tires that they manufacture and/or distribute causes "take" of ESA-protected coho salmon, Chinook salmon, and steelhead trout in violation of the ESA. *See* 16 U.S.C. §§ 1532(19); 1538(a)(1)(B), (G).

REQUEST FOR RELIEF

Accordingly, Plaintiffs respectfully request that this Court:

104. Declare that Defendants are unlawfully taking ESA-protected coho salmon, Chinook salmon, and steelhead trout in violation of the ESA.

105. Enjoin Defendants from continuing the unauthorized take of ESA-protected coho salmon, Chinook salmon, and steelhead trout.

106. Award Plaintiffs their reasonable attorneys' fees and costs.

107. Grant such other and further relief as the Court deems just, equitable, and proper.

Respectfully submitted this 8th day of November, 2023,

/s/ Elizabeth B. Forsyth
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Counsel for Plaintiffs Institute for Fisheries Resources and Pacific Coast Federation of Fishermen's Associations

Exhibit A

EARTHJUSTICE

August 15, 2023

Bridgestone Americas, Inc.
c/o United Agent Group
5901 W Century Blvd, #750
Los Angeles, CA 90045

Continental Tire the Americas, LLC
c/o CT Corporation System
330 N Brand Blvd, Suite 700
Glendale, CA 91203

Giti Tire (USA) Ltd.
c/o CSC-Lawyers Incorporating Service
2710 Gateway Oaks Dr, Suite 150N
Sacramento, CA 95833

The Goodyear Tire & Rubber Company
c/o CSC-Lawyers Incorporating Service
2710 Gateway Oaks Dr, Suite 150N
Sacramento, CA 95833

Cooper Tire & Rubber Company
c/o CSC-Lawyers Incorporating Service
2710 Gateway Oaks Dr, Suite 150N
Sacramento, CA 95833

Hankook Tire America Corp.
c/o Corporate Creations Network Inc.
5901 W Century Blvd, #750
Los Angeles, CA 90045

Nokian Tyres
c/o National Registered Agents, Inc.
300 Montvue Rd.
Knoxville, TN 37919-5546

Kumho Tire U.S.A., Inc.
c/o Doseob Kim
10299 Sixth Street
Rancho Cucamonga, CA 91730

Michelin North America, Inc.
c/o CT Corporation System
330 N Brand Blvd, Suite 700
Glendale, CA 91203

Pirelli Tire North America
c/o CSC-Lawyers Incorporating Service
2710 Gateway Oaks Dr, Suite 150N
Sacramento, CA 95833

Sumitomo Rubber North America, Inc.
c/o CSC-Lawyers Incorporating Service
2710 Gateway Oaks Dr, Suite 150N
Sacramento, CA 95833

Toyo Tire Holdings of Americas Inc.
c/o Katherine Noelle Peters
3565 Harbor Blvd
Costa Mesa, CA 92626

Yokohama Tire Corporation
c/o CT Corporation System
330 N Brand Blvd, Suite 700
Glendale, CA 91203

VIA CERTIFIED U.S. MAIL RETURN RECEIPT REQUESTED

Re: Sixty-Day Notice of Violations of the Endangered Species Act for Take of Protected Coho Salmon, Chinook Salmon, and Steelhead Trout

Dear U.S. Tire Manufactures:

On behalf of Institute for Fisheries Resources and Pacific Coast Federation of Fishermen's Associations, we hereby provide notice in accordance with the citizen suit provision of the Endangered Species Act ("ESA"), 16 U.S.C. § 1540(g), that you are in violation of Section 9 of ESA, 16 U.S.C. § 1538, for "take" of ESA-protected populations of coho salmon (*Oncorhynchus kisutch*), steelhead trout (*O. mykiss*), and Chinook salmon (*O. tshawytscha*). Specifically, the tires you manufacture and/or distribute contain N-(1,3-dimethylbutyl)-N'-phenyl-p-phenylenediamine ("6PPD"). 6PPD by design transforms at the surface of the tire or when released into the environment into various products, including 6PPD-quinone, or "6PPD-q."[1] The foreseeable discharge of 6PPD-q from your tires into waterways harms, harasses, wounds, and kills coho, Chinook, and steelhead in violation of the ESA.

6PPD-q is the second-most toxic chemical to aquatic species for which the U.S. Environmental Protection Agency has established aquatic life criteria.[2] Exposure to 6PPD-q can kill a coho salmon within hours, and the chemical is responsible for "urban runoff mortality syndrome," which kills up to 100% of coho returning to spawn in urban streams.[3] 6PPD-q from tires is also now known to be ubiquitous in our environment. It is present not only in stormwater runoff and urban watersheds at levels that can harm and kill coho salmon, steelhead trout, Chinook salmon, and other aquatic organisms, but is also now widely present in sediments and soils,[4] household dust,[5] and the urine of pregnant women,[6] with emerging science pointing to toxicity in mammals and therefore potential risk to human health as well.[7]

Many of our nation's salmon and steelhead populations have already declined dramatically to a point where they are listed under the ESA, due in part to exposure to 6PPD-q. 6PPD-q continues to harm listed salmon and steelhead, despite their listed status. If you do not

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[1] *See* CAL. DEP'T OF TOXIC SUBSTANCES CONTROL, PRODUCT – CHEMICAL PROFILE FOR MOTOR VEHICLE TIRES CONTAINING N-(1,3-DIMETHYLBUTYL)-N'-PHENYL-P-PHENYLENEDIAMINE (6PPD) (2022).

[2] Zhenyu Tian et al., *6PPD-Quinone: Revised Toxicity Assessment and Quantification with a Commercial Standard*, 9 ENVTL. SCI. & TECH. LETTERS 140, 144 tbl. 1 (2022).

[3] *Id*. at 140; Nathaniel L. Scholz et al., *Recurrent Die-Offs of Adult Coho Salmon Returning to Spawn in Puget Sound Lowland Urban Streams*, 6 PLOS ONE 1 (2011).

[4] Lixi Zeng et al., *Widespread Occurrence and Transport of* p*-Phenylenediamines and Their Quinones in Sediments across Urban Rivers, Estuaries, Coasts, and Deep-Sea Regions*, 57 ENVTL. SCI. & TECH. 2393 (2023); Guodong Cao et al., *New Evidence of Rubber-Derived Quinones in Water, Air, and Soil*, 56 ENVTL. SCI. & TECH. 4142 (2022).

[5] Wei Huang et al., *Occurrence of Substituted p-Phenylenediamine Antioxidants in Dusts*, 8 ENVTL. SCI. & TECH. LETTERS 381 (2021).

[6] Bibai Du et al., *First Report on the Occurrence of* N*-(1, 3-Dimethylbutyl)-*N*'-phenyl-p-phenylenediamine (6PPD) and 6PPD-Quinone as Pervasive Pollutants in Human Urine from South China*, 9 ENVTL. SCI. & TECH. LETTERS 1056 (2022).

[7] Liya Fang et al, *Oral Exposure to Tire Rubber-Derived Contaminant 6PPD and 6PPD-Quinone Induce Hepatotoxicity in Mice*, 869 Sci. of the Total Env't 161836 (2023).

cease unauthorized take of these species within 60 days, we intend to seek redress through litigation.

I. THE ENDANGERED SPECIES ACT

In 1973, recognizing that certain wildlife species "ha[d] been so depleted in numbers that they [we]re in danger of or threatened with extinction," 16 U.S.C. § 1531(a)(2), Congress enacted the ESA, "to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved, [and] to provide a program for the conservation of such endangered species and threatened species." *Id.* § 1531(b). Considered "the most comprehensive legislation for the preservation of endangered species ever enacted by any nation," the ESA embodies the "plain intent" of Congress to "halt and reverse the trend toward species extinction, whatever the cost." *Tenn. Valley Auth. v. Hill*, 437 U.S. 153, 180, 184 (1978).

To afford a marine species such as coho salmon, Chinook salmon, and steelhead trout the protections of the ESA, the Secretary of Commerce, acting here through the National Marine Fisheries Service ("NMFS"), must first list the species as either "endangered" or "threatened" pursuant to Section 4 of the ESA. 16 U.S.C. § 1533. A species is "endangered" when it "is in danger of extinction throughout all or a significant portion of its range," *id.* § 1532(6), while a species is "threatened" when it is "likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range." *Id.* § 1532(20); *see also id.* § 1533(c).

For species listed under the ESA, the statute contains an array of provisions designed to afford them "the highest of priorities," so that they can recover to the point where federal protection is no longer needed. *Tenn. Valley Auth.*, 437 U.S. at 174. Of relevance here, Section 9 of the ESA prohibits "take" of endangered species. 16 U.S.C. § 1538(a)(1)(B). Exercising its authority under Section 4(d) of the ESA, *id.* § 1533(d), NMFS has promulgated regulations extending Section 9's take prohibition to threatened coho salmon, Chinook salmon, and steelhead. 50 C.F.R. § 223.203; *see also id.* § 223.102.

The take prohibition makes it unlawful for any person to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect" an individual of a protected species. 16 U.S.C. § 1532(19). Congress intended to define "take" under Section 9 in the "broadest possible manner to include every conceivable way" in which a person could harm protected fish or wildlife. S. REP. NO. 93-307, at 7 (1973), *as reprinted in* 1973 U.S.C.C.A.N. 2989, 2995. As part of its 4(d) rules for threatened salmon and steelhead, NMFS specifically considers that "discharges or dumping of toxic chemicals or other pollutants (e.g., sewage, oil, gasoline) into waters or riparian areas supporting listed [entities]" may violate the Section 9 take prohibition.[8]

[8] Endangered and Threatened Species: Final Listing Determinations for 16 ESUs of West Coast Salmon, and Final 4(d) Protective Regulations for Threatened Salmonid ESUs, 70 Fed. Reg. 37,160 (June 28, 2005); Endangered and Threatened Species: Final Protective Regulations for Threatened Puget Sound Steelhead, 73 Fed. Reg. 55,451 (Sept. 25, 2008) (extending this take guidance to Puget Sound steelhead); Endangered and Threatened Species; Final Rule Governing Take of 14 Threatened Salmon and Steelhead Evolutionarily Significant Units (ESUs), 65 Fed.

NMFS regulations also define "harm" prohibited by Section 9 to include "an act which actually kills or injures fish or wildlife." 50 C.F.R. § 222.102. NMFS intended for this definition of "harm" to be consistent and substantively aligned with the definition of harm promulgated for terrestrial species by the U.S. Fish and Wildlife Service ("USFWS"),[9] which shares responsibility with NMFS for enforcing the ESA. The U.S. Supreme Court has upheld USFWS's regulation interpreting "harm" prohibited by Section 9 to include acts or omissions that proximately cause the death or injury of protected fish or wildlife. *Babbitt v. Sweet Home Chapter of Cmtys. for a Great Ore.*, 515 U.S. 687, 697–98, 700 & n.13 (1995); *see also* Endangered and Threatened Wildlife and Plants; Final Redefinition of "Harm," 46 Fed. Reg. 54,748, 54,750 (Nov. 4, 1981) (stating in preamble to rule defining "harm" under Section 9 that "the Service feels that 'act' [in the definition of 'harm'] is inclusive of either commissions or omissions which would be prohibited by section 9"). NMFS has also explained that "[a]n action which contributes to injury can be a 'take' even if it is not the only cause of the injury." Endangered and Threatened Wildlife and Plants; Definition of "Harm," 64 Fed. Reg. 60,727, 60,728 (Nov. 8, 1999); *see also id*. ("NMFS agrees that sometimes it is difficult to isolate factors causing injury to listed species. All factors that reasonably could have caused the habitat modification or the injury itself must be carefully examined. Whenever an action alone or in combination with, or in concert with other actions is reasonably certain to injure or kill listed species, it will constitute a take.").

Section 9 likewise makes it unlawful to "harass" protected fish or wildlife. 16 U.S.C. § 1532(19). Though NMFS has not elaborated on the meaning of "harass" in a regulation, its counterpart agency USFWS provides that, under Section 9, "harass" means "an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering." 50 C.F.R. § 17.3.

II. PROTECTION OF COHO SALMON, CHINOOK SALMON, AND STEELHEAD TROUT UNDER THE ESA

Salmon and steelhead were once abundant on the West Coast of the United States, and are a defining element of the region's economy, with salmon alone supporting an estimated 16,000 jobs in the commercial and recreational fishing industry.[10]

Reg. 42,422 (July 10, 2000) (extending these protective regulations to 14 threatened salmon and steelhead ESUs).

[9] *Compare* 50 C.F.R. § 17.3 (FWS regulation) *with* 50 C.F.R. § 222.102 (NMFS regulation). The preamble to NMFS' final Harm Rule expressly states NMFS' intent to define "harm" in the same way that USFWS does. Endangered and Threatened Wildlife and Plants; Definition of "Harm," 64 Fed. Reg. 60,727, 60,727 (Nov. 8, 1999) ("This final rule clarifies that NMFS' interpretation of harm is consistent with that of FWS.").

[10] Marie Fazio, *Northwest's Salmon Population May be Running Out of Time*, N.Y. TIMES (Jan. 20, 2021), https://www.nytimes.com/2021/01/20/climate/washington-salmon-extinction-climate-change.html; *see also* GORDON GISLASON & EDNA LAM, ECONOMIC IMPACTS OF PACIFIC SALMON FISHERIES 27 (July 2017).

Populations of salmon and steelhead have markedly declined, however, since Euro-American contact, with an estimated 29% of nearly 1,400 historical populations of Pacific salmon and steelhead trout already lost.[11] Many formerly abundant populations have collapsed up and down the coast; today, approximately 2% of historic populations of wild salmon and steelhead remain.[12] The loss of these salmon and steelhead populations have reverberated across the economies and ecosystems of the region, causing a domino effect that affects the livelihoods of fishing men and women, including those represented by Institute for Fisheries Resources and Pacific Coast Federation of Fishermen's Associations.

As a result of this decline, many populations of coho salmon, Chinook salmon, and steelhead are now listed as threatened or endangered under the ESA. For ESA-listing purposes, NMFA has administratively grouped steelhead and salmon populations into distinct population segments ("DPSs") (steelhead) or "evolutionary significant units ("ESUs") (coho salmon and Chinook salmon). These DPSs and ESUs are considered "species" under the ESA. *See* 16 U.S.C. § 1532(16) (defining "species" under the ESA as including "any distinct population segment of any species of vertebrate fish . . . which interbreeds when mature"). Today, twenty-four DPSs/ESUs of coho, Chinook, and steelhead are protected under the ESA. They are described below:

A. Protected Coho Salmon Populations

Coho salmon range from "the Soviet Far East around the Bering Sea, to Alaska, and south along the North American coast to California."[13] They have dark metallic blue or greenish backs with silver sides and are commonly referred to as silver salmon. Females lay their eggs in gravel nests in freshwater streams, and newly hatched coho spend one year in freshwater streams and rivers before migrating to the ocean where they spend 1.5 years growing and feeding. They complete their lifecycle by returning to their natal streams where they spawn and die.[14]

Coho are considered highly adaptable as "reflected in the broad range of migration and spawning timing, the multitude of suitable freshwater habitats, the variety of foods consumed in both fresh water and salt water, and the various strategies followed in ocean rearing."[15] Add to

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[11] Richard G. Gustafson et al., *Pacific Salmon Extinctions: Quantifying Lost and Remaining Diversity*, 21 CONSERVATION BIOLOGY 1009 (2007); *see also* Willa Nehlsen et al., *Pacific Salmon at the Crossroads: Stocks at Risk from California, Oregon, Idaho, and Washington*, 16 FISHERIES 4 (1991).

[12] Marie Fazio, *Northwest's Salmon Population May be Running Out of Time*, N.Y. TIMES (Jan. 20, 2021), https://www.nytimes.com/2021/01/20/climate/washington-salmon-extinction-climate-change.html.

[13] F.K. Sandercock, *Life History of Coho Salmon (Oncorhynchus kisutch)*, *in* PACIFIC SALMON LIFE HISTORIES 397 (Cornelis Croot & Leo Margolis eds., 1991).

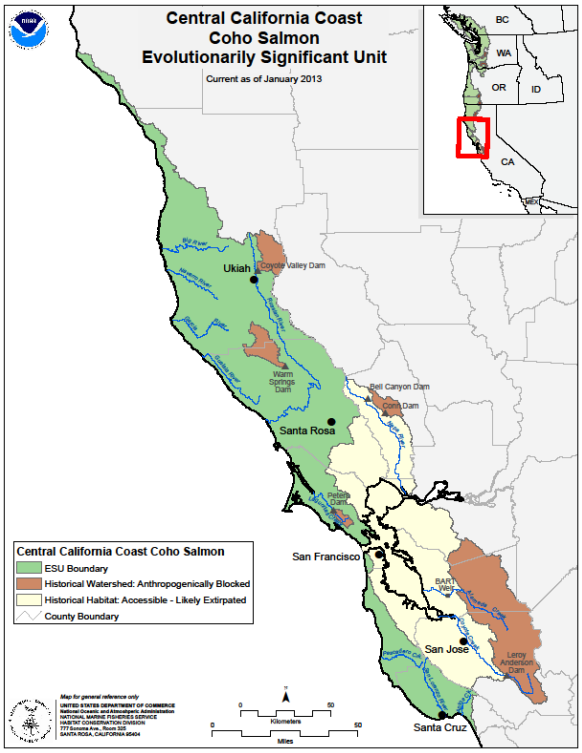
[14] *Coho Salmon*, NAT'L OCEANIC & ATMOSPHERIC ADMIN. (2023), https://www.fisheries.noaa.gov/species/coho-salmon.

[15] F.K. Sandercock, *Life History of Coho Salmon (Oncorhynchus kisutch)*, *in* PACIFIC SALMON LIFE HISTORIES 435 (Cornelis Croot & Leo Margolis eds., 1991).

this the fact that coho, in many cases, are able to "overcome difficult obstructions to reach areas inaccessible to other salmon."[16] Despite this high adaptability, however, coho salmon populations in California are estimated to be less than 6% of their levels in the 1940s, with a 70% decline since the 1960s.[17]

1. *Central California Coast Coho ESU (Endangered)*

The Central California Coast Coho ESU "includes all naturally spawned populations of coho salmon from Punta Gorda in northern California south to and including the San Lorenzo River in central California, as well as populations in tributaries to San Francisco Bay, excluding the Sacramento-San Joaquin River system."[18] Historically, population estimates of spawning Central California Coast coho salmon ESU members numbered 56,100 in the 1960s.[19] As of 2011, there are estimated to be fewer than 3,000 remaining.[20] This ESU was originally listed as threatened in 1996, and was reclassified as endangered in 2005.[21] NMFS's most recent status review for the population notes a continuing long-term downward trend in



[16] *Id.*

[17] Larry R. Brown et al., *Historical Decline and Current Status of Coho Salmon in California*, 14 N. AM. J. FISHERIES MGMT. 237 (1994); *see also* Carri J. LeRoy et al., *Salmon Carcasses Influence Genetic Linkages Between Forests and Streams*, 73 CAN. J. FISHERIES & AQUATIC SCI. 910 (2016).

[18] Endangered and Threatened Species: Final Listing Determinations for 16 ESUs of West Coast Salmon, and Final 4(d) Protective Regulations for Threatened Salmonid ESUs, 70 Fed. Reg. 37,160, 37,176 (June 28, 2005).

[19] I NAT'L MARINE FISHERIES SERV., FINAL RECOVERY PLAN FOR CENTRAL CALIFORNIA COAST COHO SALMON EVOLUTIONARILY SIGNIFICANT UNIT 56 fig. 8 (2012).

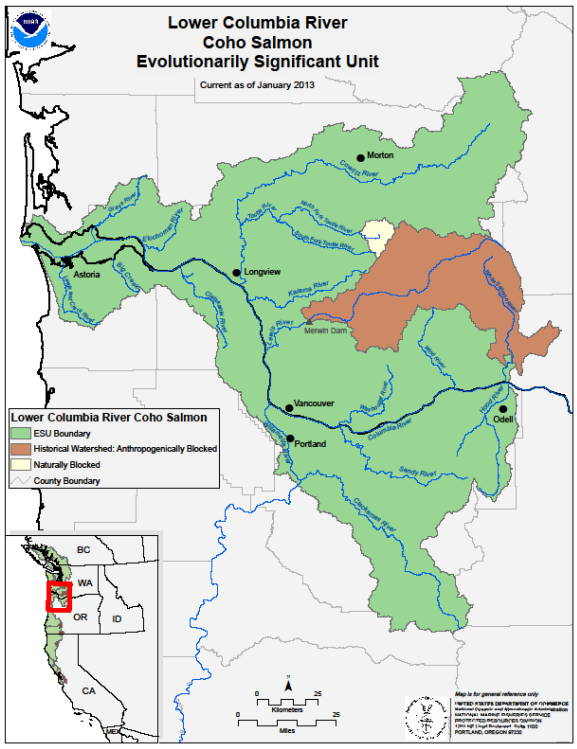
[20] *Id.* at 55; THOMAS H. WILLIAMS ET AL., VIABILITY ASSESSMENT FOR PACIFIC SALMON AND STEELHEAD LISTED UNDER THE ENDANGERED SPECIES ACT: SOUTHWEST 37 (Nat'l Oceanic & Atmospheric Admin. Technical Memorandum, July 2016).

[21] Endangered and Threatened Species: Final Listing Determinations for 16 ESUs of West Coast Salmon, and Final 4(d) Protective Regulations for Threatened Salmonid ESUs, 70 Fed. Reg. 37,160, 37,176 (June 28, 2005).

numbers.[22] The status review highlights that because the ESU "overlaps with the greater San Francisco Bay Area, a relatively densely populated area that has experienced steady population growth during the past several decades," it is threatened by water pollution from urban runoff.[23] NMFS predicts these "urban-related impacts are likely to worsen in the future as the Bay Area population grows by a predicted 30% between the years 2010 and 2040."[24]

2. *Lower Columbia River Coho ESU (Threatened)*

The Lower Columbia River Coho ESU includes "all naturally spawned populations of coho salmon in the Columbia River and its tributaries from the mouth of the Columbia up to and including the Big White Salmon and Hood Rivers, and includes the Willamette River to Willamette Falls, Oregon."[25] This ESU historically consisted of a total of 24 interdependent populations, with each estimated to have historical abundances of natural-origin spawners in the thousands or tens of thousands.[26] The Lower Columbia River coho ESU has been in decline for the past 50 years,[27] and was listed under the ESA as threatened in 2005.[28] It has continued to decline in the past five years.[29] *Id.* Most populations are now believed to have 50 fish or fewer, and of the 24 populations, NMFS considers 21 "to have a very low probability of

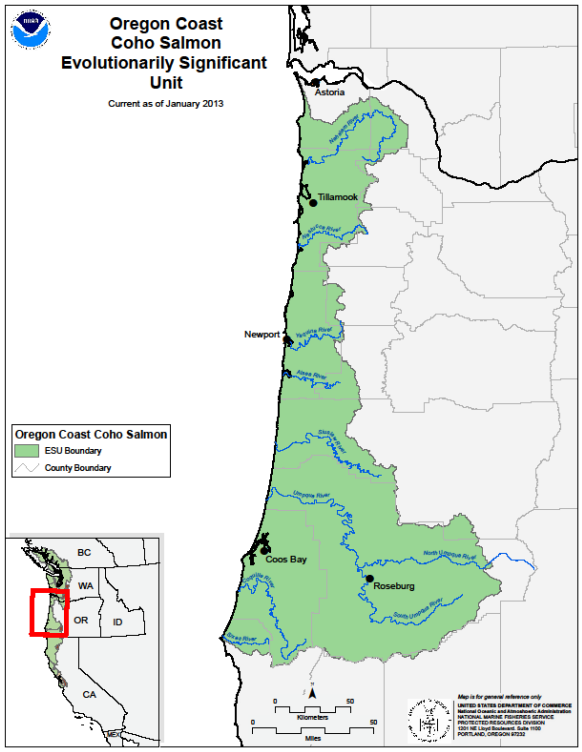


[22] NAT'L MARINE FISHERIES SERV., 2016 5-YEAR REVIEW: SUMMARY & EVALUATION OF CENTRAL CALIFORNIA COAST COHO SALMON 32–33 (Apr. 2016).
[23] *Id.* at 18.
[24] *Id.*
[25] Endangered and Threatened Species: Final Listing Determinations for 16 ESUs of West Coast Salmon, and Final 4(d) Protective Regulations for Threatened Salmonid ESUs, 70 Fed. Reg. 37,160, 37,176 (June 28, 2005).
[26] NAT'L MARINE FISHERIES SERV., ESA RECOVERY PLAN FOR LOWER COLUMBIA RIVER COHO SALMON, LOWER COLUMBIA RIVER CHINOOK SALMON, COLUMBIA RIVER CHUM SALMON, AND LOWER COLUMBIA RIVER STEELHEAD 6-10 to 11 tbl. 6-4 (2013).
[27] *Id.* at 6-6.
[28] Endangered and Threatened Species: Final Listing Determinations for 16 ESUs of West Coast Salmon, and Final 4(d) Protective Regulations for Threatened Salmonid ESUs, 70 Fed. Reg. 37,160 (June 28, 2005).
[29] NAT'L MARINE FISHERIES SERV., 2022 5-YEAR REVIEW: SUMMARY & EVALUATION OF LOWER COLUMBIA RIVER CHINOOK SALMON, COLUMBIA RIVER CHUM SALMON, LOWER COLUMBIA RIVER COHO SALMON, LOWER COLUMBIA RIVER STEELHEAD 32 (2022).

persisting for the next 100 years."[30] NMFS specially lists "toxic contamination" as an ongoing habitat concern for the ESU,[31] and has explained that "managing urban stormwater . . . to reduce contaminant in streams" will be "key to protecting and improving the habitat conditions."[32] At the same time, NMFS expects human population growth to increase in the region, predicting that increased urbanization will "increase the amount of impervious surfaces (pavement, roofs etc.) in watersheds" thus "increasing surface runoff during storm events."[33]

3. *Oregon Coast Coho ESU (Threatened)*

The Oregon Coast Coho includes "[n]aturally spawned coho salmon originating from coastal rivers south of the Columbia River and north of Cape Blanco" as well as coho salmon from the Cow Creek Hatchery Program.[34] State and federal scientists estimate that one to two million adult coho salmon returned each year during the 1800s and early 1900s.[35] In recent years, however, returning coho salmon have numbered fewer than 100,000, and



[30] NAT'L MARINE FISHERIES SERV., ESA RECOVERY PLAN FOR LOWER COLUMBIA RIVER COHO SALMON, LOWER COLUMBIA RIVER CHINOOK SALMON, COLUMBIA RIVER CHUM SALMON, AND LOWER COLUMBIA RIVER STEELHEAD 6-5 (2013).

[31] NAT'L MARINE FISHERIES SERV., 2022 5-YEAR REVIEW: SUMMARY & EVALUATION OF LOWER COLUMBIA RIVER CHINOOK SALMON, COLUMBIA RIVER CHUM SALMON, LOWER COLUMBIA RIVER COHO SALMON, LOWER COLUMBIA RIVER STEELHEAD 34 (2022); *see also* NAT'L MARINE FISHERIES SERV., ESA RECOVERY PLAN FOR LOWER COLUMBIA RIVER COHO SALMON, LOWER COLUMBIA RIVER CHINOOK SALMON, COLUMBIA RIVER CHUM SALMON, AND LOWER COLUMBIA RIVER STEELHEAD 6-14 tbl. 6-5 (2013).

[32] NAT'L MARINE FISHERIES SERV., ESA RECOVERY PLAN FOR LOWER COLUMBIA RIVER COHO SALMON, LOWER COLUMBIA RIVER CHINOOK SALMON, COLUMBIA RIVER CHUM SALMON, AND LOWER COLUMBIA RIVER STEELHEAD 4-7 (2013).

[33] *Id*. at 4–56.

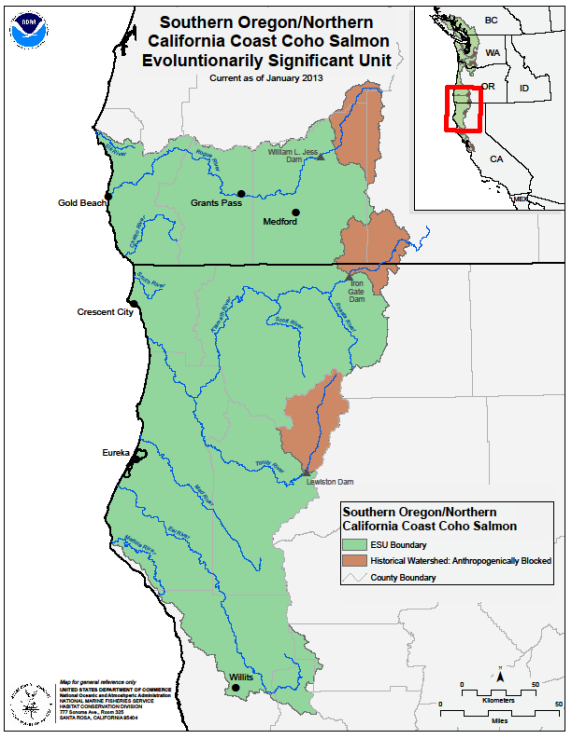
[34] Endangered and Threatened Wildlife; Final Rule to Revise the Code of Federal Regulations for Species Under the Jurisdiction of the National Marine Fisheries Service, 79 Fed. Reg. 20,802 (Apr. 14, 2014).

[35] NAT'L MARINE FISHERIES SERV., FINAL ESA RECOVERY PLAN FOR OREGON COAST COHO SALMON (*ONCORHYNCHUS KISUTCH*) S-2 (2016).

they were listed as threatened in 1998.[36] NMFS notes that "urban and rural-residential development has caused profound changes in storm water runoff" which has decreased habitat quality and availability for Oregon Coast coho.[37]

4. *Southern Oregon/Northern California Coho ESU (Threatened)*

The Southern Oregon/Northern California Coho ESU "includes all naturally spawned populations of coho salmon in coastal streams between Cape Blanco, Oregon and Punta Gorda, California, as well as coho salmon produced by three artificial propagation programs: Cole Rivers Hatchery, Trinity River Hatchery, and Iron Gate Hatchery."[38] Historically, estimates for spawning coho salmon numbered in the hundreds of thousands in Northern California and Southern Oregon streams and rivers.[39] The Rogue River alone saw up to 114,000 spawning adults in the 1800s, "even after heavy fishing pressure had occurred for years."[40] This number dropped to less than 5,000 by 1980.[41] The Southern Oregon/Northern California coho ESU was listed under the ESA as threatened in 1997,[42] and "[t]he status of the species has continued to worsen since listing, despite fishing prohibitions and habitat improvements."[43] The current extinction risk for this population is predicted to be high in most



[36] *Id.*; Endangered and Threatened Species; Threatened Status for the Oregon Coast Evolutionarily Significant Unit of Coho Salmon, 63 Fed. Reg. 42,587 (Aug. 10, 1998).
[37] NAT'L MARINE FISHERIES SERV., FINAL ESA RECOVERY PLAN FOR OREGON COAST COHO SALMON (*ONCORHYNCHUS KISUTCH*) 3-3 tbl. 3-1 (2016).
[38] NAT'L MARINE FISHERIES SERV., FINAL RECOVERY PLAN FOR THE SOUTHERN OREGON/NORTHERN CALIFORNIA COAST EVOLUTIONARILY SIGNIFICANT UNIT OF COHO SALMON ES-1 (2014).
[39] *Id.*
[40] *Id.* at 1-1 (citation omitted).
[41] *Id.* at 1-2 fig. 1-1.
[42] Endangered and Threatened Species; Threatened Status for Southern Oregon/Northern California Coast Evolutionarily Significant Unit (ESU) of Coho Salmon, 62 Fed. Reg. 24,588 (May 6, 1997)
[43] NAT'L MARINE FISHERIES SERV., FINAL RECOVERY PLAN FOR THE SOUTHERN OREGON/NORTHERN CALIFORNIA COAST EVOLUTIONARILY SIGNIFICANT UNIT OF COHO SALMON 1-1 (2014) (citation omitted).

rivers in this ESU,[44] and NMFS has identified roads and urban/industrial/residential development as significant threats, stating that "[t]hese threats have led to significant stresses on coho salmon populations throughout the ESU. . . and have contributed to the decline of the species."[45]

B. Protected Chinook Salmon Populations

Chinook salmon range from "northern Hokkaido to the Anadyr River on the Asian coast and from central California to Kotzebue Sound, Alaska, on the North American coast."[46] They are the largest Pacific salmon and are often referred to as "king salmon." They also earned the nickname "blackmouth" from the black pigment along their gumline. Females lay their eggs in gravel nests in freshwater streams, and newly hatched Chinook spend several months in freshwater streams and rivers before migrating to the ocean where they spend 1-6 years growing and feeding. They complete their lifecycle by returning to their natal streams where they spawn and die.[47]

Chinook salmon possess significant variability between populations, proving they are intrinsically malleable with "the capability to adapt quickly to new opportunities."[48] This adaptability is an evolutionary strategy that has enabled Chinook to "persist in the face of continued heavy fishing pressure and, in some systems, significant habitat modification."[49] Despite this adaptability, however, nine populations are currently listed under the ESA as endangered or threatened, and in 2023, California Chinook salmon populations fell to their lowest level in years.[50]

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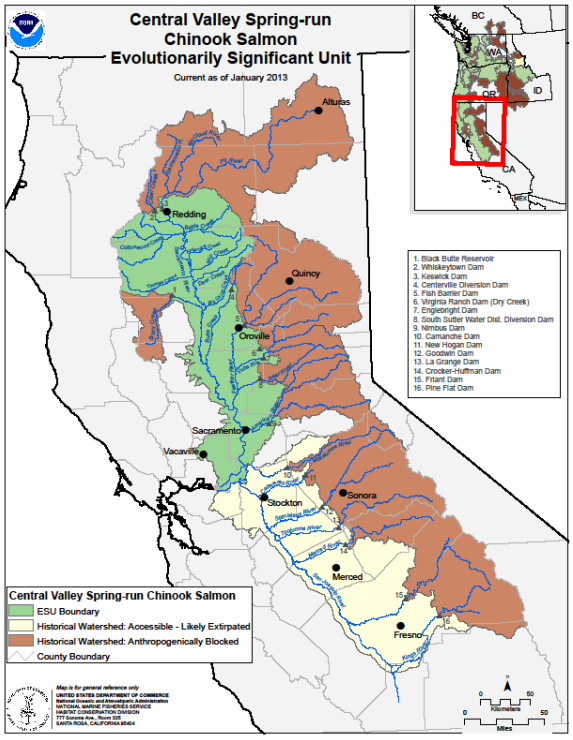
[44] NAT'L MARINE FISHERIES SERV., 2016 5-YEAR REVIEW: SUMMARY AND EVALUATION OF SOUTHERN OREGON/NORTHERN CALIFORNIA COAST COHO SALMON 22, tbl. 9 (2016).
[45] NAT'L MARINE FISHERIES SERV., FINAL RECOVERY PLAN FOR THE SOUTHERN OREGON/NORTHERN CALIFORNIA COAST EVOLUTIONARILY SIGNIFICANT UNIT OF COHO SALMON 3-40 (2014).
[46] M.C. Healey, *Life History of Chinook Salmon (*Oncorhynchus tshawytscha*), in* PACIFIC SALMON LIFE HISTORIES 315 (Cornelis Croot & Leo Margolis eds., 1991).
[47] *Chinook Salmon*, NAT'L OCEANIC & ATMOSPHERIC ADMIN. (2023), https://www.fisheries.noaa.gov/species/chinook-salmon.
[48] M.C. Healey, *Life History of Chinook Salmon (*Oncorhynchus tshawytscha*), in* PACIFIC SALMON LIFE HISTORIES 382 (Cornelis Croot & Leo Margolis eds., 1991).
[49] *Id.* at 383.
[50] Ian James, *Declining Salmon Population Could Trigger Closure of Fishing Season in California Waters*, L.A. TIMES (Mar. 2, 2023), https://www.latimes.com/environment/story/2023-03-02/declining-salmon-population-could-trigger-ban-on-fishing.

1. *Central Valley Spring-run Chinook ESU (Threatened)*



The Central Valley Spring-Run Chinook ESU is composed of the San Joaquin River Basin and "the Sacramento River Basin downstream of impassible barriers."[51] The rivers in the Central Valley were once "renowned for their production of large numbers of Pacific salmon," with Chinook representing the most abundant salmon species in the area.[52] In 1880, the total commercial catch of Chinook was 11 million pounds.[53] The Chinook population has since declined dramatically, leading NMFS to propose listing the spring-run population under the ESA as endangered in March of 1998. By that time, the native spring-run Chinook had been extirpated from all tributaries in the San Joaquin River Basin, "which represented a large portion of the historic range and abundance of the ESU," and the only streams with remaining fish in the Central Valley contained relatively small populations in sharp decline.[54] NMFS ultimately decided to list the ESU as threatened in September of 1998.[55] Though Chinook populations for this ESU have shown a small increase during recent years, they are still well under historic levels, falling under 25,000 for all Central Valley tributaries during the spring-run.[56] Due to the urbanization of the Sacramento area, NMFS

[51] NAT'L MARINE FISHERIES SERV., 5-YEAR REVIEW: SUMMARY AND EVALUATION OF CENTRAL VALLEY SPRING-RUN CHINOOK SALMON EVOLUTIONARILY SIGNIFICANT UNIT 8 (2016); NAT'L MARINE FISHERIES SERV., RECOVERY PLAN FOR THE EVOLUTIONARILY SIGNIFICANT UNITS OF SACRAMENTO RIVER WINTER-RUN CHINOOK SALMON AND CENTRAL VALLEY SPRING-RUN CHINOOK SALMON AND THE DISTINCT POPULATION SEGMENT OF CALIFORNIA CENTRAL VALLEY STEELHEAD 2 (2014).

[52] NAT'L MARINE FISHERIES SERV., RECOVERY PLAN FOR THE EVOLUTIONARILY SIGNIFICANT UNITS OF SACRAMENTO RIVER WINTER-RUN CHINOOK SALMON AND CENTRAL VALLEY SPRING-RUN CHINOOK SALMON AND THE DISTINCT POPULATION SEGMENT OF CALIFORNIA CENTRAL VALLEY STEELHEAD 1 (2014).

[53] *Id*. at 2.

[54] *Id*. at 29.

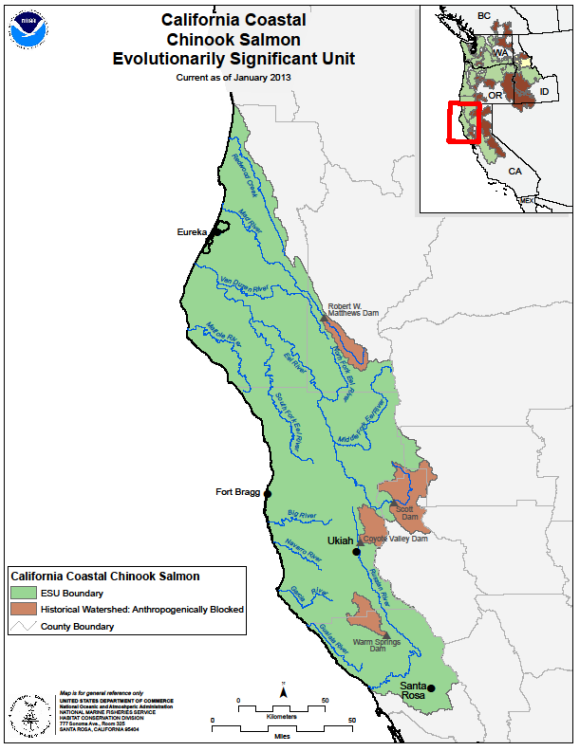
[55] Endangered and Threatened Species; Threatened Status for Two Chinook Salmon Evolutionarily Significant Units (ESUs) in California, 64 Fed. Reg. 50,394 (Sept. 16, 1999).

[56] NAT'L MARINE FISHERIES SERVICE, 5-YEAR REVIEW: SUMMARY AND EVALUATION OF CENTRAL VALLEY SPRING-RUN CHINOOK SALMON EVOLUTIONARILY SIGNIFICANT UNIT 13–15 (2016).

has identified stormwater runoff as a significant threat to the ESU,[57] stating that it is "consistently toxic to fish."[58]

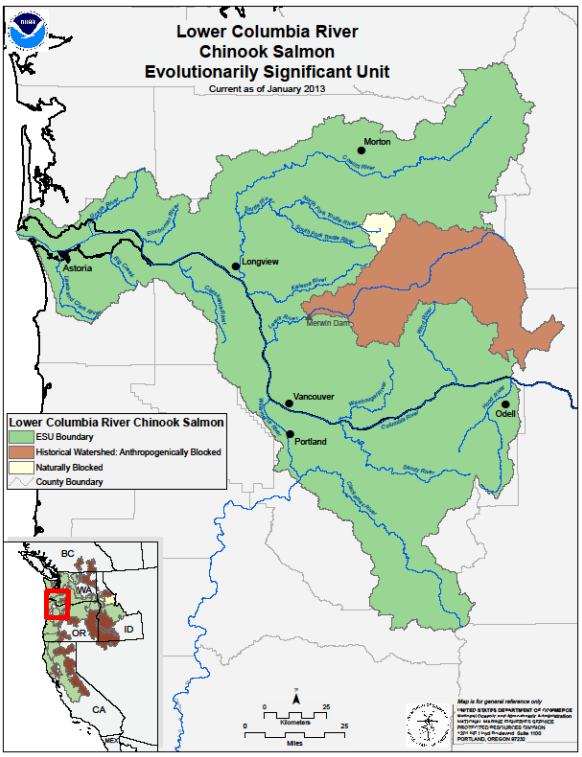
2. *California Coast Chinook ESU (Threatened)*

The California Coastal Chinook ESU "includes all naturally spawned populations of Chinook salmon from rivers and streams south of the Klamath River (Humboldt County, CA) to the Russian River (Sonoma County, CA)."[59] Populations in this ESU show marked declines from historical levels. Extrapolated data suggests that historic runs in the Eel River Watershed alone "could have ranged between 100,000 and 800,000 fish per year."[60] This abundant population declined rapidly, causing the closure of the commercial fishery and cannery operations in the watershed by 1926. By the 1960s the population "had declined substantially," with some years reporting far less than 10,000 fish returning to the watershed.[61] Despite being listed under the ESA as threatened in 1999,[62] current data "provide[s] no indication that any of the independent populations (likely to persist in isolation) are approaching viability targets."[63] NMFS identified stormwater runoff as a significant threat to the ESU.[64]



[57] NAT'L MARINE FISHERIES SERV., RECOVERY PLAN FOR THE EVOLUTIONARILY SIGNIFICANT UNITS OF SACRAMENTO RIVER WINTER-RUN CHINOOK SALMON AND CENTRAL VALLEY SPRING-RUN CHINOOK SALMON AND THE DISTINCT POPULATION SEGMENT OF CALIFORNIA CENTRAL VALLEY STEELHEAD App. A at 20 (2014).
[58] NAT'L MARINE FISHERIES SERV., 5-YEAR REVIEW: SUMMARY AND EVALUATION OF CENTRAL VALLEY SPRING-RUN CHINOOK SALMON EVOLUTIONARILY SIGNIFICANT UNIT 27 (2016).
[59] NAT'L MARINE FISHERIES SERV., COASTAL MULTISPECIES PLAN VOLUME II: CALIFORNIA COASTAL CHINOOK SALMON 1 (2016).
[60] *Id*. at 86.
[61] *Id*. at 86–89.
[62] Endangered and Threatened Species; Threatened Status for Two Chinook Salmon Evolutionarily Significant Units (ESUs) in California, 64 Fed. Reg. 50,394 (Sept. 16, 1999).
[63] NAT'L MARINE FISHERIES SERV., 2016 5-YEAR REVIEW: SUMMARY & EVALUATION OF CALIFORNIA COASTAL CHINOOK SALMON AND NORTHERN CALIFORNIA STEELHEAD 12 (2016).
[64] *Id*. at 17–18.

3. *Lower Columbia River Chinook ESU (Threatened)*



The Lower Columbia River Chinook ESU includes Chinook from 17 artificial propagation programs as well as "[a]ll naturally spawned populations of Chinook salmon from the Columbia River and its tributaries from the river's mouth at the Pacific Ocean upstream to and including the Hood River in Oregon and the White Salmon River in Washington, including the Willamette River to Willamette Falls, Oregon, but excluding spring-run Chinook salmon in the Clackamas River."[65] More than 295,000 Chinook once navigated the Lower Columbia River and its tributaries.[66] These numbers dropped dramatically, leading to the ESU's threatened listing under the ESA in 1999.[67] Of the 32 populations comprising this ESU, only two are considered viable, while "[m]ost populations (26 out of 32) have a very low probability of persistence over the next 100 years (and some are extirpated[])."[68] The ESU has experienced over 95% population loss, with fewer than 14,000 Chinook now traversing its rivers and streams.[69] Toxic contamination of water from stormwater runoff and nonpoint source pollution is a key factor contributing to the ESU's low numbers.[70] Considering the region's population of 5 million people is expected to grow exponentially to between 40 million and 100 million by the end of the century, toxin infiltration of waterways will result in increasingly devastating effects.[71]

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[65] NAT'L MARINE FISHERIES SERV., ESA RECOVERY PLAN FOR LOWER COLUMBIA RIVER COHO SALMON, LOWER COLUMBIA RIVER CHINOOK SALMON, COLUMBIA RIVER CHUM SALMON, AND LOWER COLUMBIA RIVER STEELHEAD 1-9 (2013).

[66] *Id*. at 7-16 to 7-17, tbl. 7-4.

[67] Endangered and Threatened Species; Threatened Status for Three Chinook Salmon Evolutionarily Significant Units (ESUs) in Washington and Oregon, and Endangered Status for One Chinook Salmon ESU in Washington, 64 Fed. Reg. 14,308 (Mar. 24, 1999).

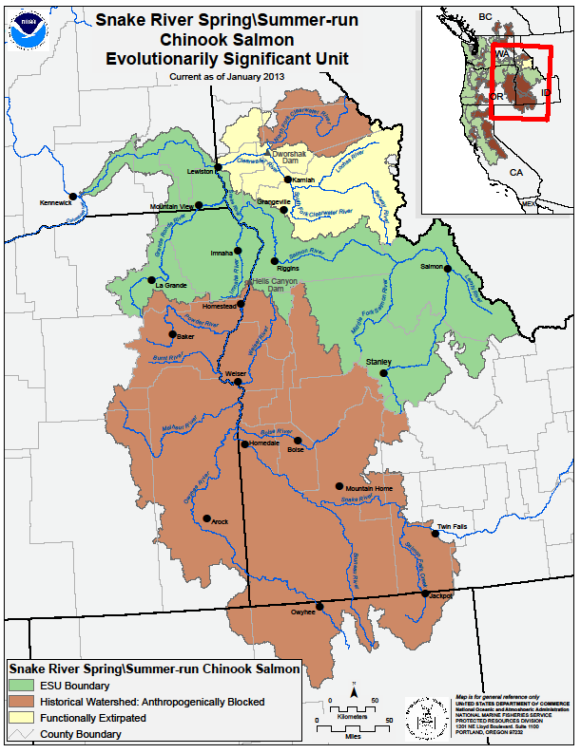
[68] NAT'L MARINE FISHERIES SERV., ESA RECOVERY PLAN FOR LOWER COLUMBIA RIVER COHO SALMON, LOWER COLUMBIA RIVER CHINOOK SALMON, COLUMBIA RIVER CHUM SALMON, AND LOWER COLUMBIA RIVER STEELHEAD 7-6 (2013).

[69] *Id*. at 7-16 to 7-17, tbl. 7-4 (2013).

[70] NAT'L MARINE FISHERIES SERV., 2022 5-YEAR REVIEW: SUMMARY & EVALUATION OF LOWER COLUMBIA RIVER CHINOOK SALMON, COLUMBIA RIVER CHUM SALMON, LOWER COLUMBIA RIVER COHO SALMON, LOWER COLUMBIA RIVER STEELHEAD 34 (2022).

[71] NAT'L MARINE FISHERIES SERV., ESA RECOVERY PLAN FOR LOWER COLUMBIA RIVER COHO SALMON, LOWER COLUMBIA RIVER CHINOOK SALMON, COLUMBIA RIVER CHUM SALMON, AND LOWER COLUMBIA RIVER STEELHEAD 1-7 to 1-8 (2013).

4. *Snake River Spring/Summer-run Chinook ESU (Threatened)*

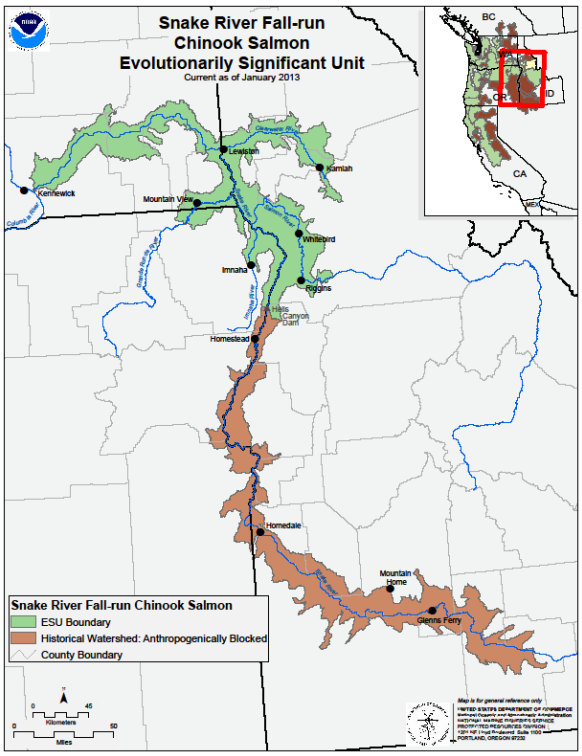


The Snake River Spring/Summer-run Chinook ESU "includes all naturally spawned spring/summer Chinook salmon originating from the mainstem Snake River and the Tucannon River, Grande Ronde River, Imnaha River, and Salmon River subbasins."[72] This ESU was once "revered by Native Americans and local communities and prized by fisheries" for its impressive runs. The runs began to decline in the late 1800s and continued to deteriorate throughout the 1900s, leading many populations in the ESU to become extinct.[73] NMFS listed the Snake River Spring/Summer-run ESU under the ESA as threatened in 1992.[74] However, the future of the ESU remains perilous, with sharp population declines noted within the last five years.[75] Toxic pollutant runoff from urban sources is a contributing factor to this diminishing population.[76] Runoff is especially problematic in streams experiencing water withdrawals, where low flows result in high concentrations of pollutants.[77] With low flows a primary limiting factor for most tributaries in this ESU, the impact of continued toxic runoff could prove devastating on this acutely declining population.[78]

[72] NAT'L MARINE FISHERIES SERV., ESA RECOVERY PLAN FOR SNAKE RIVER SPRING/SUMMER CHINOOK SALMON (ONCORHYNCHUS TSHAWYTSCHA) & SNAKE RIVER BASIN STEELHEAD (*ONCORHYNCHUS MYKISS*) 27 (2017).
[73] *Id*. at 26.
[74] Endangered and Threatened Species; Threatened Status for Snake River Spring/Summer Chinook Salmon, Threatened Status for Snake River Fall Chinook Salmon, 57 Fed. Reg. 14,653 (Apr. 22, 1992).
[75] NAT'L MARINE FISHERIES SERV., 2022 5-YEAR REVIEW: SUMMARY & EVALUATION OF SNAKE RIVER SPRING/SUMMER CHINOOK SALMON 16–17 (2022).
[76] NAT'L MARINE FISHERIES SERV., ESA RECOVERY PLAN FOR SNAKE RIVER SPRING/SUMMER CHINOOK SALMON (*ONCORHYNCHUS TSHAWYTSCHA*) & SNAKE RIVER BASIN STEELHEAD (*ONCORHYNCHUS MYKISS*) 161–62 (2017).
[77] *Id*. at 131–32.
[78] *See id*. at 134–35 (NAT'L MARINE FISHERIES SERV., 2022 5-YEAR REVIEW: SUMMARY & EVALUATION OF SNAKE RIVER SPRING/SUMMER CHINOOK SALMON 31 (2022).

5. *Snake River Fall-run Chinook ESU (Threatened)*

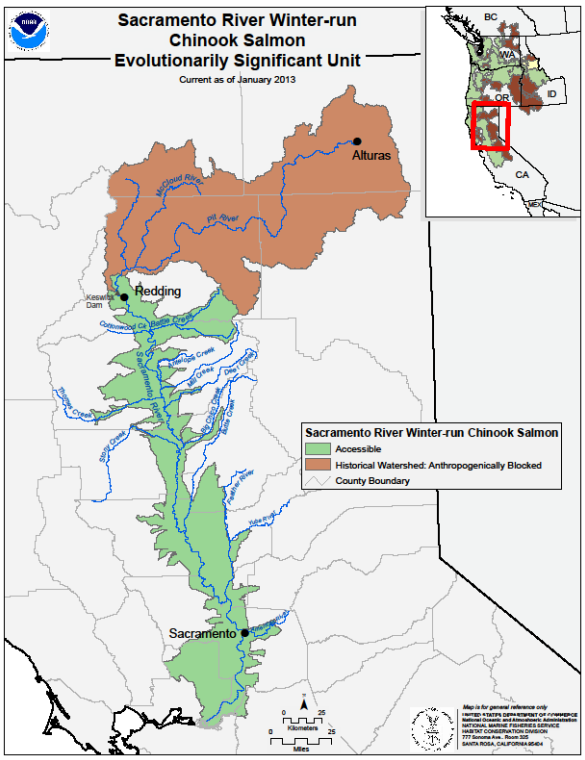
The Snake River Fall-run Chinook ESU contains Chinook salmon from four artificial propagation programs as well as "all natural-origin fall Chinook salmon originating from the lower Snake River below Hells Canyon Dam and from the Tucannon River, Grande Ronde River, Imnaha River, Salmon River, and Clearwater River subbasins."[79] Over half a million Chinook once traveled through the Snake River basin each fall. These numbers began to drop precipitously in the late 1800s. By the 1980s the ESU was seeing an average of only 100 adults each year.[80] This catastrophic decline led NMFS to list the ESU under the ESA as threatened in 1992.[81] The population increased following the ESA listing, reaching 20,000 spawning adults in 2013.[82] Unfortunately, this increase did not last and the population has since declined.[83] NMFS identified urban runoff as a primary threat to this ESU.[84]



[79] NAT'L MARINE FISHERIES SERV., ESA RECOVERY PLAN FOR SNAKE RIVER FALL CHINOOK SALMON (*ONCORHYNCHUS TSHAWYTSCHA*) 48 (2017).
[80] *Id*. at 47.
[81] Endangered and Threatened Species; Threatened Status for Snake River Spring/Summer Chinook Salmon, Threatened Status for Snake River Fall Chinook Salmon, 57 Fed. Reg. 14,653 (Apr. 22, 1992).
[82] NAT'L MARINE FISHERIES SERV., 2022 5-YEAR REVIEW: SUMMARY AND EVALUATION OF SNAKE RIVER FALL-RUN CHINOOK SALMON 16 (2022).
[83] *Id*.
[84] NAT'L MARINE FISHERIES SERV., ESA RECOVERY PLAN FOR SNAKE RIVER FALL CHINOOK SALMON (*ONCORHYNCHUS TSHAWYTSCHA*) 229, 231 (2017).

6. *Sacramento River Winter-run Chinook ESU (Endangered)*

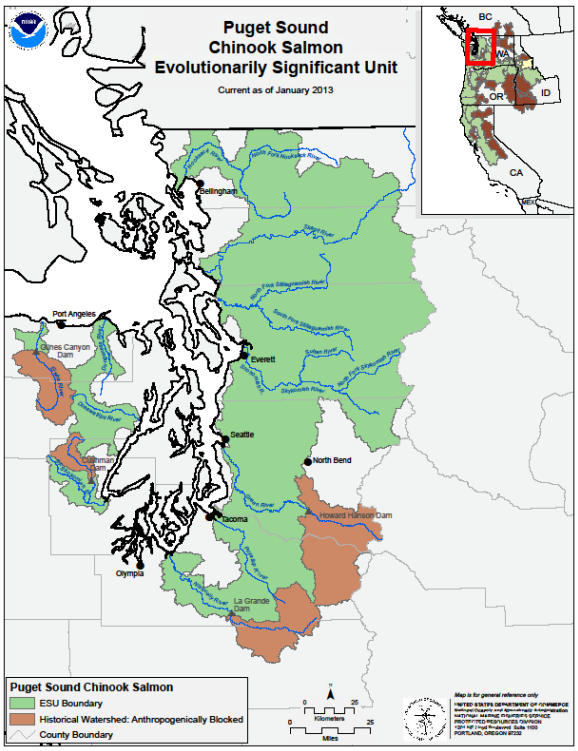
The Sacramento River Winter-run Chinook ESU "includes winter-run Chinook salmon spawning naturally in the Sacramento River and its tributaries, as well as winter-run Chinook salmon that are part of the conservation hatchery program at the Livingston Stone National Fish Hatchery."[85] This ESU contained nearly 100,000 salmon in the 1960s. This number plummeted to fewer than 200 in the 1990s. [86] NMF original listed the ESU under the ESA as threatened in 1989 under emergency provisions, but reclassified the population as endangered in 1992.[87] Stormwater runoff laced with toxins is one of the many threats impacting the waterways comprising this ESU. The San Francisco Bay/Sacramento-San Joaquin Delta area receives between 5,000 to 40,000 tons of contaminants annually from point- and non-point sources, including urban stormwater runoff.[88] NMFS indicates that input rates of toxic pollution are on the rise.[89]



[85] NAT'L MARINE FISHERIES SERV., RECOVERY PLAN FOR THE EVOLUTIONARILY SIGNIFICANT UNITS OF SACRAMENTO RIVER WINTER-RUN CHINOOK SALMON AND CENTRAL VALLEY SPRING-RUN CHINOOK SALMON AND THE DISTINCT POPULATION SEGMENT OF CALIFORNIA CENTRAL VALLEY STEELHEAD 11 (2014).
[86] *Id*. at 17.
[87] Endangered and Threatened Species; Status of Sacramento River Winter-run Chinook Salmon, 59 Fed. Reg. 440 (Jan. 4, 1994); Endangered and Threatened Species; Critical Habitat; Winter-run Chinook Salmon, 54 Fed. Reg. 32,085 (Aug. 4, 1989).
[88] NAT'L MARINE FISHERIES SERV., RECOVERY PLAN FOR THE EVOLUTIONARILY SIGNIFICANT UNITS OF SACRAMENTO RIVER WINTER-RUN CHINOOK SALMON AND CENTRAL VALLEY SPRING-RUN CHINOOK SALMON AND THE DISTINCT POPULATION SEGMENT OF CALIFORNIA CENTRAL VALLEY STEELHEAD app. B at 2-25 (2014).
[89] *Id*. app. B at 2-24 (2014).

7. *Puget Sound Chinook ESU (Threatened)*

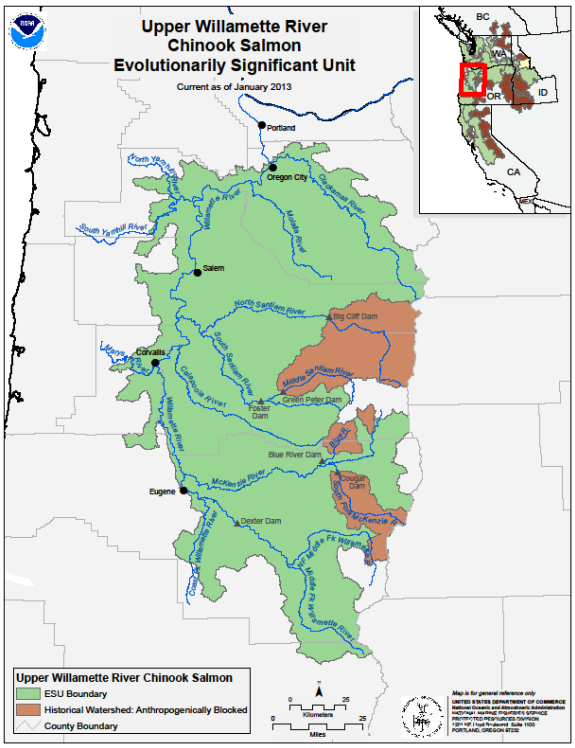
The Puget Sound Chinook ESU is bordered by "the Nooksack River in the North to southern Puget Sound, includes Hood Canal, and extends westerly out of the Strait of Juan de Fuca to the Elwha River."[90] It includes both naturally spawning and hatchery Chinook salmon. It is estimated that 670,000 Chinook were harvested from the ESU in 1908.[91] The ESU was listed under the ESA as threatened in 1999.[92] Despite listing, most populations continue to decline.[93] Stormwater runoff containing toxic contaminants is a growing concern as the human population in this area is fast-growing.[94]



[90] I NAT'L MARINE FISHERIES SERV., PUGET SOUND SALMON RECOVERY PLAN 44 (2007).
[91] Endangered and Threatened Species; Threatened Status for Three Chinook Salmon Evolutionarily Significant Units (ESUs) in Washington and Oregon, and Endangered Status for One Chinook Salmon ESU in Washington, 64 Fed. Reg. 14,308, 14318 (Mar. 24, 1999).
[92] *Id*. at 14,308.
[93] NAT'L MARINE FISHERIES SERV., 2016 5-YEAR REVIEW: SUMMARY & EVALUATION OF PUGET SOUND CHINOOK SALMON, HOOD CANAL SUMMER-RUN CHUM SALMON, PUGET SOUND STEELHEAD 19 (2016).
[94] *Id*. at 22.

8. *Upper Willamette River Chinook ESU (Threatened)*

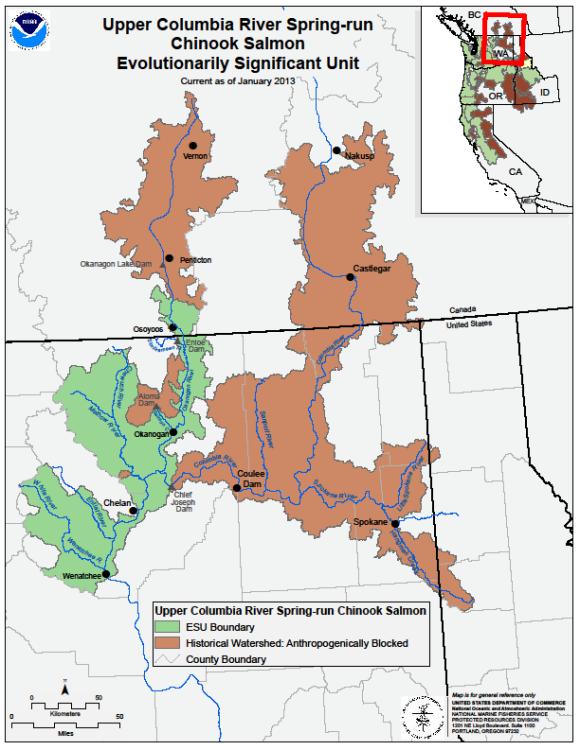
The Upper Willamette River Chinook ESU "includes all naturally spawned populations of spring Chinook salmon in the Clackamas River and in the Willamette Basin upstream of Willamette Falls," as well as six artificial propagation programs.[95] Historically, salmon numbers for this ESU are estimated at 300,000. These numbers dropped to less than 10,000, with hatchery origin fish comprising 80–90% of that total.[96] NMFS listed the ESU under the ESA as threatened in 1999.[97] Stormwater runoff from urban sources is a continuing threat.[98] The situation will continue to deteriorate as the human population increases in the area from 2.5 million to an expected 3.85 million by 2040.[99]



[95] NAT'L MARINE FISHERIES SERV., UPPER WILLAMETTE RIVER CONSERVATION AND RECOVERY PLAN FOR CHINOOK SALMON AND STEELHEAD 1-1 (2011).
[96] *Id.* at 4-3.
[97] Endangered and Threatened Species; Threatened Status for Three Chinook Salmon Evolutionarily Significant Units (ESUs) in Washington and Oregon, and Endangered Status for One Chinook Salmon ESU in Washington, 64 Fed. Reg. 14,308 (Mar. 24, 1999).
[98] NAT'L MARINE FISHERIES SERV., UPPER WILLAMETTE RIVER CONSERVATION AND RECOVERY PLAN FOR CHINOOK SALMON AND STEELHEAD 5-36 (2011).
[99] *Id.* at 5-24.

9. *Upper Columbia River Spring-run Chinook ESU (Endangered)*

The Upper Columbia River Spring-run Chinook ESU includes both naturally spawned and artificially propagated salmon in "the Columbia River and its tributaries between Rock Island Dam and Chief Joseph Dam."[100] Historically, it is estimated that 588,000 Chinook comprised this ESU.[101] Resource extraction beginning in the 1860s depleted the population leading to its endangered listing under the ESA in 1999.[102] Despite listing, the population continues to deteriorate. The most recent status review states that the population has declined by 48% within the previous five years.[103] Emerging contaminants caused by urban development are of increasing concern.[104] With human population increases predicted for the area, toxic contaminants infiltrating the water will also increase.[105]



[100] NAT'L MARINE FISHERIES SERV., UPPER COLUMBIA SPRING CHINOOK SALMON AND STEELHEAD RECOVERY PLAN 1 (2007).
[101] *Id*. at 28.
[102] Endangered and Threatened Species; Threatened Status for Three Chinook Salmon Evolutionarily Significant Units (ESUs) in Washington and Oregon, and Endangered Status for One Chinook Salmon ESU in Washington, 64 Fed. Reg. 14,308 (Mar. 24, 1999).
[103] NAT'L MARINE FISHERIES SERV., 2022 5-YEAR REVIEW: SUMMARY & EVALUATION OF UPPER COLUMBIA RIVER SPRING-RUN CHINOOK SALMON AND UPPER COLUMBIA RIVER STEELHEAD 19 (2022).
[104] NAT'L MARINE FISHERIES SERV., COLUMBIA RIVER ESTUARY ESA RECOVERY PLAN MODULE FOR SALMON AND STEELHEAD 4-13, 4-15 (January 2011).
[105] *Id*. at 1-10, 3-15, 4-15.

C. Protected Steelhead Trout Populations

Historically, steelhead trout ranged from the Bristol Bay area in Alaska to Baja California, but their range is shrinking and currently extends from Cold Bay on the Alaska Peninsula to central California.[106] Steelhead trout are the ocean-going form of the species *Oncorhynchus mykiss*. Juveniles rear in freshwater before migrating to the ocean to mature. They return as adults to their natal freshwater streams to spawn. Unlike salmon, steelhead can spawn multiple times in their lifespan.[107] *Oncorhynchus mykiss* that remain in freshwater are called rainbow trout. [108]

Steelhead trout can jump 11 feet in the air when climbing waterfalls and can accelerate from zero to 25 miles per hour in one second.[109] They have shifted their migration timing to coincide with cooler temperatures in an ever-warming world, and they "excel at colonizing newly created habitat and adapting locally to complicated dynamics."[110] Despite their amazing capabilities and adaptability, 11 of the 14 steelhead populations on the West Coast are listed under the ESA as endangered or threatened, and a lack of historical baseline data for steelhead populations, especially those not listed, means that current estimates likely "underestimate the loss of population diversity and abundance."[111]

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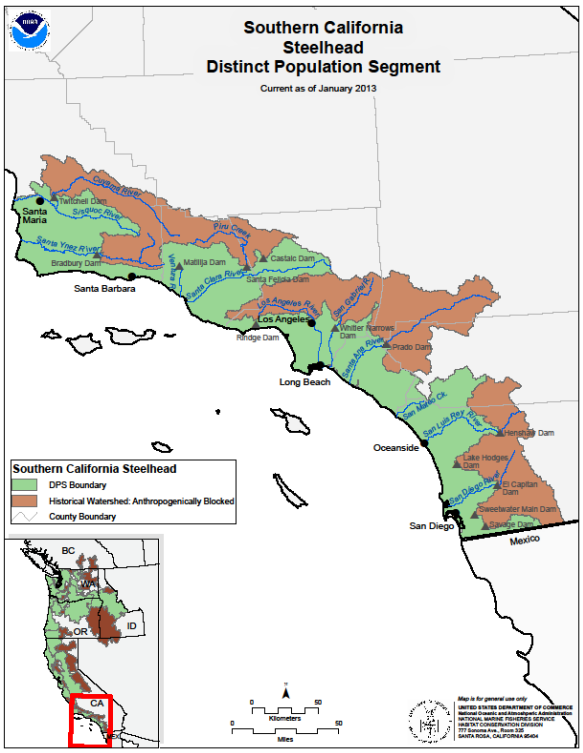
[106] JEFFREY T. LIGHT ET AL., OCEAN DISTRIBUTION AND MIGRATION OF STEELHEAD (*ONCORHYNCHUS MYKISS*, FORMERLY *SALMO GAIRDNERI*) 1 (1989).
[107] *Rainbow Trout*, U.S. FISH & WILDLIFE SERV. (2023), https://www.fws.gov/species/rainbow-trout-oncorhynchus-mykiss.
[108] NOAA Fisheries, *Steelhead Trout*, U.S. FISH & WILDLIFE SERV. (2023), https://www.fisheries.noaa.gov/species/steelhead-trout.
[109] *Rainbow Trout*, U.S. FISH & WILDLIFE SERV. (2023), https://www.fws.gov/species/rainbow-trout-oncorhynchus-mykiss.
[110] Lisa Crozier & Michelle McClure, *Steelhead Persistence and Adaptation in a Warming World*, 81 OSPREY 9, 9 (2015).
[111] *Id.*; John R. McMillan, *Historical Records Reveal Changes to the Migration Timing and Abundance of Winter Steelhead in Olympic Peninsula Rivers, Washington State, USA*, 42 N. AM. J. FISHERIES MGMT. 3, 18 (2022).

1. *Southern California Steelhead DPS (Endangered)*



The Southern California Steelhead DPS "includes all naturally spawned populations of steelhead in streams from the Santa Maria River, San Luis Obispo County, California (inclusive) to the U.S.-Mexico Border."[112] Historically, annual runs in the Southern California DPS of steelhead were estimated to have 32,000–46,000 returning adults.[113] This number has since declined to fewer than 500 returning adults,[114] however, and the DPS was listed under the ESA as endangered in 1996.[115] The decline in Southern California steelhead was in large part due to human activities, including urbanization, with a "substantial increase of impermeable surfaces as a result of urbanization (including roads)" detrimentally altering the natural flow regimes of steelhead habitat.[116] Estuarine habitat used by steelhead as rearing areas for juveniles and smolts has been particularly negatively affected; "[a]pproximately 75 percent of estuarine habitats across the [Southern California Steelhead] Recovery Planning Area have been lost and the remaining 25 percent is constrained by agricultural and urban development, levees, and transportation corridors highways and railroads [*sic*]."[117] NMFS notes that the Southern California Steelhead DPS remains threatened by urbanization.[118]

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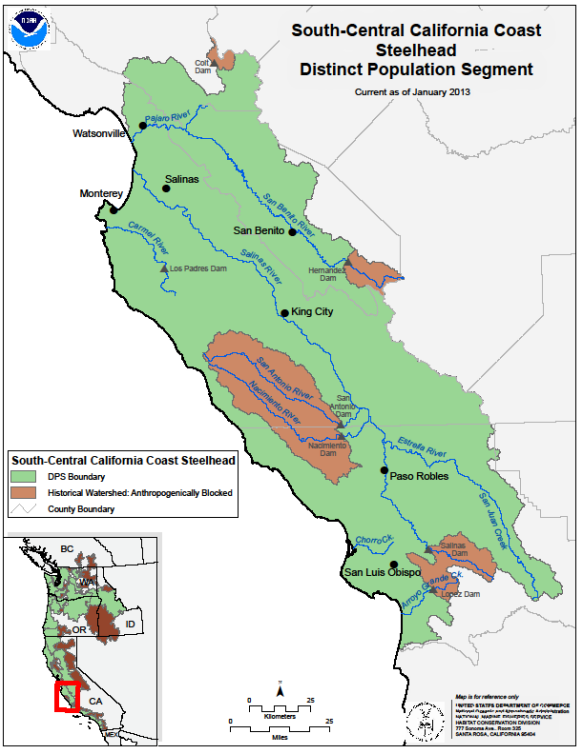
[112] Endangered and Threatened Species: Final Listing Determinations for 10 Distinct Population Segments of West Coast Steelhead, 71 Fed. Reg. 834, 848 (Jan. 5, 2006).
[113] NAT'L MARINE FISHERIES SERV., SOUTHERN CALIFORNIA STEELHEAD RECOVERY PLAN, at xiii (2012).
[114] *Id.*
[115] Endangered and Threatened Species: Listing of Several Evolutionary Significant Units (ESUs) of West Coast Steelhead, 62 Fed. Reg. 43,937 (Aug. 18, 1997).
[116] NAT'L MARINE FISHERIES SERVICE, SOUTHERN CALIFORNIA STEELHEAD RECOVERY PLAN 3-2 (2012).
[117] *Id.* at 4-7.
[118] NAT'L MARINE FISHERIES SERV., SOUTH-CENTRAL, SOUTHERN CALIFORNIA COAST STEELHEAD RECOVERY PLANNING DOMAIN 5-YEAR REVIEW: SUMMARY AND EVALUATION OF SOUTHERN CALIFORNIA COAST STEELHEAD DISTINCT POPULATION SEGMENT 34 (2016).

2. *South-Central California Coast Steelhead DPS (Threatened)*

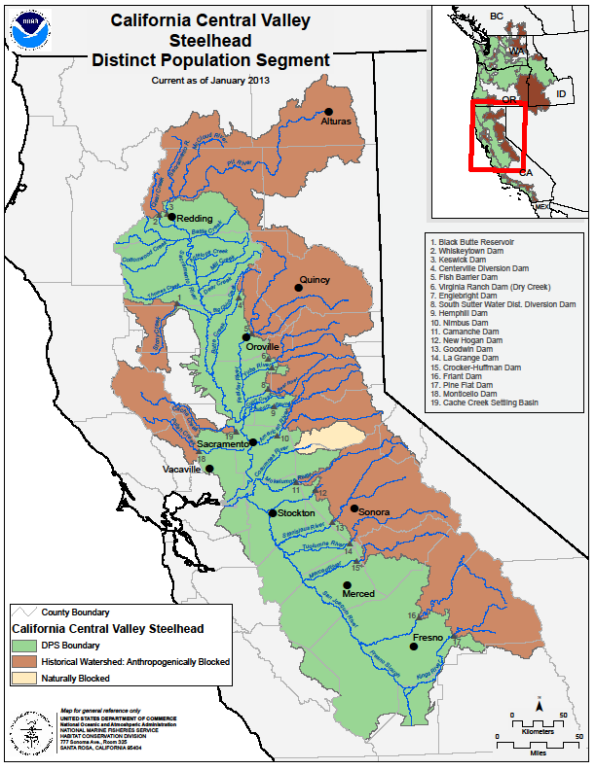
The South-Central California Coast Steelhead DPS "includes all naturally spawned populations of steelhead in streams from the Pajaro River (inclusive) to, but not including the Santa Maria River, California."[119] The South-Central California Coast Steelhead DPS has declined dramatically from an estimated 25,000 returning adults historically, to fewer than 500 returning adults today.[120] It was listed as threatened under the ESA in 1997.[121] The South-Central California Coast Steelhead DPS has declined in part due to urbanization that has "resulted in the loss, degradation, simplification, and fragmentation of habitat,"[122] and the "Recovery Planning Area is characterized by severe to very severe degradation of habitat conditions along the lower mainstem river channels where urban and agricultural development is concentrated[.]"[123]



[119] Endangered and Threatened Species: Final Listing Determinations for 10 Distinct Population Segments of West Coast Steelhead, 71 Fed. Reg. 834, 848 (Jan. 5, 2006).
[120] NAT'L MARINE FISHERIES SERV., SOUTH-CENTRAL CALIFORNIA STEELHEAD RECOVERY PLAN, at xi (2013).
[121] Endangered and Threatened Species: Listing of Several Evolutionary Significant Units (ESUs) of West Coast Steelhead, 62 Fed. Reg. 43,937 (Aug. 18, 1997).
[122] NAT'L MARINE FISHERIES SERV., SOUTH-CENTRAL/SOUTHERN CALIFORNIA COAST STEELHEAD RECOVERY PLANNING DOMAIN 5-YEAR REVIEW: SUMMARY AND EVALUATION OF SOUTH-CENTRAL CALIFORNIA COAST STEELHEAD DISTINCT POPULATION SEGMENT 33 (2016).
[123] NAT'L MARINE FISHERIES SERV., SOUTH-CENTRAL CALIFORNIA STEELHEAD RECOVERY PLAN 8-1 (2013).

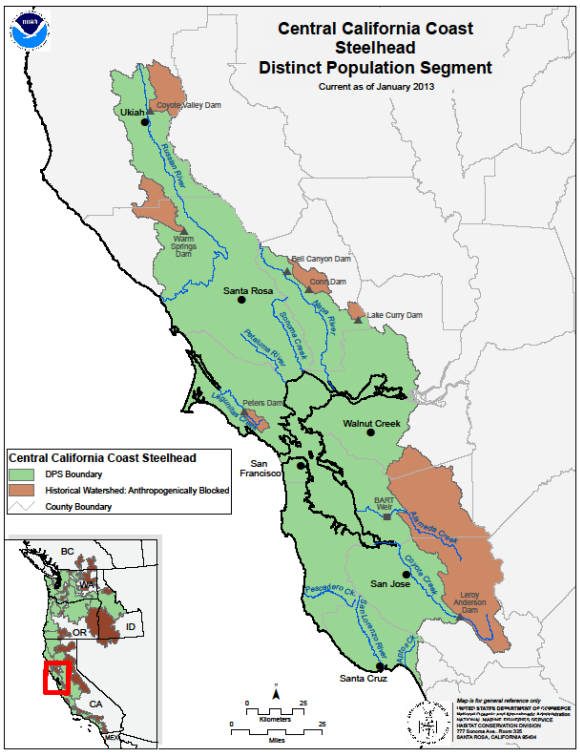
3. *California Central Valley Steelhead DPS (Threatened)*

The California Central Valley Steelhead DPS "includes all naturally spawned populations of steelhead in the Sacramento and San Joaquin Rivers and their tributaries, excluding steelhead from San Francisco and San Pablo Bays and their tributaries."[124] Steelhead were once "common in Central Valley tributaries," and may have approached "one to two million adults annually" but have "declined dramatically since European settlement of the Central Valley in the mid-1800s.[125] The California Central Valley Steelhead DPS was listed as threatened under the ESA in 1998.[126] Habitat quantity and quality have continued to decline, in part due to urbanization.[127] In particular, NMFS notes that toxic urban stormwater runoff in the Sacramento River poses a threat to the DPS.[128]



[124] Endangered and Threatened Species: Final Listing Determinations for 10 Distinct Population Segments of West Coast Steelhead, 71 Fed. Reg. 834, 849 (Jan. 5, 2006).
[125] NAT'L MARINE FISHERIES SERV., RECOVERY PLAN FOR THE EVOLUTIONARILY SIGNIFICANT UNITS OF SACRAMENTO RIVER WINTER-RUN CHINOOK SALMON AND CENTRAL VALLEY SPRING-RUN CHINOOK SALMON AND THE DISTINCT POPULATION SEGMENT OF CALIFORNIA CENTRAL VALLEY STEELHEAD, at i, 4-5 (2014) (citations omitted).
[126] Endangered and Threatened Species: Threatened Status for Two ESUs of Steelhead in Washington, Oregon, and California, 63 Fed. Reg. 13,347 (Mar. 19, 1998).
[127] NAT'L MARINE FISHERIES SERV., RECOVERY PLAN FOR THE EVOLUTIONARILY SIGNIFICANT UNITS OF SACRAMENTO RIVER WINTER-RUN CHINOOK SALMON AND CENTRAL VALLEY SPRING-RUN CHINOOK SALMON AND THE DISTINCT POPULATION SEGMENT OF CALIFORNIA CENTRAL VALLEY STEELHEAD, at i–ii, 4-14 (2014).
[128] *Id*. at 4-22.

4. *Central California Coast Steelhead DPS (Threatened)*

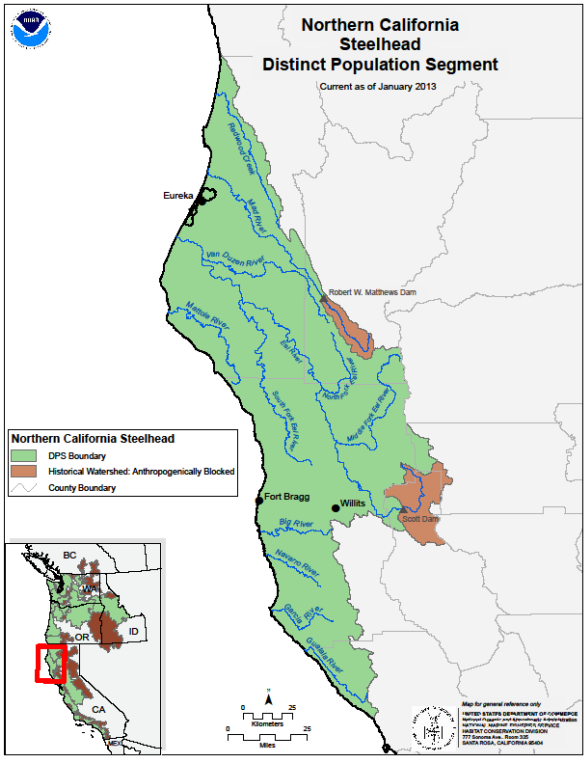


The Central California Coast Steelhead DPS includes "all naturally spawned populations of steelhead in coastal streams from the Russian River (inclusive) to Aptos Creek (inclusive), and the drainages of San Francisco, San Pablo, and Suisun Bays eastward to Chipps Island at the confluence of the Sacramento and San Joaquin Rivers; and tributary streams to Suisun Marsh including Suisun Creek, Green Valley Creek, and an unnamed tributary to Cordelia Slough (commonly referred to as a Red Top Creek), exclusive of the Sacramento-San Joaquin River Basin of the California Central Valley."[129] Historically, a total of 94,000 adult steelhead spawned in the rivers and streams of the Central California Coast Steelhead DPS.[130] Low survival of juveniles in freshwater has contributed to precipitous declines of steelhead throughout the central California coast,[131] and they were listed under the ESA as threatened in 2006.[132] The most impacted populations over the last 70 years are those surrounding San Francisco Bay, with NMFS recognizing that their habitat has been degraded by construction of roads and urban development.[133] NMFS predicts this DPS "may not be viable in the long term."[134]

[129] Endangered and Threatened Species: Final Listing Determinations for 10 Distinct Population Segments of West Coast Steelhead, 71 Fed. Reg. 834, 849 (Jan. 5, 2006).
[130] NAT'L MARINE FISHERIES SERV., FINAL COASTAL MULTISPECIES RECOVERY PLAN CALIFORNIA COASTAL CHINOOK SALMON, NORTHERN CALIFORNIA STEELHEAD, CENTRAL CALIFORNIA 36 (2016).
[131] *Id*. at vi.
[132] Endangered and Threatened Species: Final Listing Determinations for 10 Distinct Population Segments of West Coast Steelhead, 71 Fed. Reg. 834 (Jan. 5, 2006).
[133] NAT'L MARINE FISHERIES SERV., FINAL COASTAL MULTISPECIES RECOVERY PLAN CALIFORNIA COASTAL CHINOOK SALMON, NORTHERN CALIFORNIA STEELHEAD, CENTRAL CALIFORNIA, at vi (2016).
[134] *Id*. at 37.

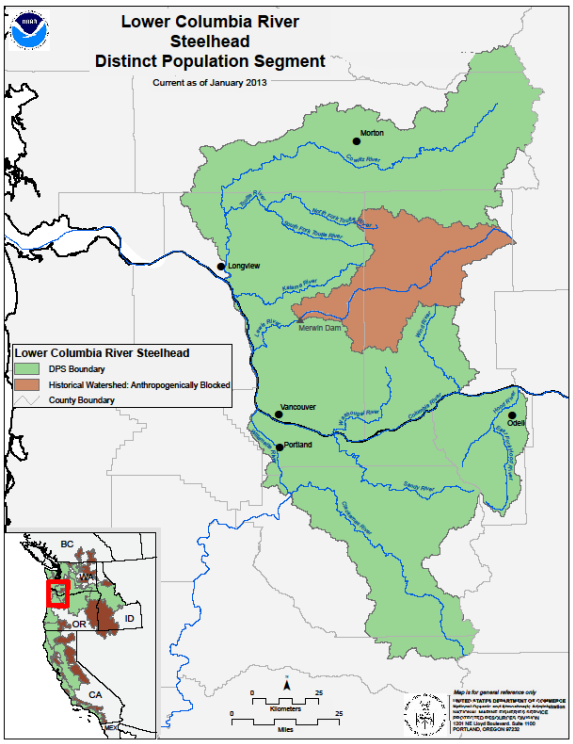
5. *Northern California Steelhead DPS (Threatened)*

The Northern California Steelhead DPS includes "all naturally spawned populations of steelhead in California coastal river basins from Redwood Creek southward to, but not including, the Russian River."[135] Prior to the 1960s, approximately 198,000 adult steelhead migrated upstream to spawn in the major rivers of the Northern California Steelhead DPS. Currently, population abundance is very low relative to historical estimates, with recent trends downward in most populations.[136] The DPS was listed under the ESA as threatened in 2006.[137] NMFS describes the high road density throughout the watershed as a "High threat to adult, egg, and winter rearing juveniles, and a Very High threat to summer rearing juveniles" because it accelerates both "sediment delivery" and "storm runoff" to riparian and aquatic habitat. [138]



[135] Endangered and Threatened Species: Final Listing Determinations for 10 Distinct Population Segments of West Coast Steelhead, 71 Fed. Reg. 834, 849 (Jan. 5, 2006).
[136] NAT'L MARINE FISHERIES SERV., FINAL COASTAL MULTISPECIES RECOVERY PLAN CALIFORNIA COASTAL CHINOOK SALMON, NORTHERN CALIFORNIA STEELHEAD, CENTRAL CALIFORNIA 34–35 (2016).
[137] Endangered and Threatened Species: Final Listing Determinations for 10 Distinct Population Segments of West Coast Steelhead, 71 Fed. Reg. 834 (Jan. 5, 2006).
[138] III NAT'L MARINE FISHERIES SERV., FINAL COASTAL MULTISPECIES RECOVERY PLAN: NORTHERN CALIFORNIA STEELHEAD 116 (2016).

6. *Lower Columbia Steelhead DPS (Threatened)*



The Lower Columbia Steelhead DPS "includes all naturally spawned populations of steelhead in streams and tributaries to the Columbia River between the Cowlitz and Wind Rivers, Washington (inclusive), and the Willamette and Hood Rivers, Oregon (inclusive). Excluded are steelhead in the upper Willamette River Basin above Willamette Falls and steelhead from the Little and Big White Salmon Rivers in Washington."[139] "Historically, the Lower Columbia River steelhead DPS consisted of 23 independent populations: 17 winter-run populations and six summer-run populations."[140] The Lower Columbia Steelhead DPS was listed under the ESA as threatened in 1998,[141] and "[t]oday, 16 of the 23 Lower Columbia River steelhead populations have a low or very low probability of persisting over the next 100 years, and six populations have a moderate probability of persistence."[142] Reduced habitat quality limits the viability of steelhead in the Columbia River estuary, with NMFS noting that "system-wide" habitat is affected by "degraded water quality"[143] and "[t]oxic contaminants are widespread in the estuary, both geographically and in the food chain."[144] NMFS notes that so far, "[t]he Clean Water Act has not been sufficient to prevent pollution of the Lower Columbia River. Toxic contamination through the production, use, and disposal of numerous chemicals from multiple sources including industrial, agricultural, medical and pharmaceutical, and common household uses enter the Columbia River in wastewater

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[139] Endangered and Threatened Species: Final Listing Determinations for 10 Distinct Population Segments of West Coast Steelhead, 71 Fed. Reg. 834, 849 (Jan. 5, 2006).

[140] NAT'L MARINE FISHERIES SERV., ESA RECOVERY PLAN FOR LOWER COLUMBIA RIVER COHO SALMON, LOWER COLUMBIA RIVER CHINOOK SALMON, COLUMBIA RIVER CHUM SALMON, AND LOWER COLUMBIA RIVER STEELHEAD ES-31 (2013).

[141] Endangered and Threatened Species: Threatened Status for Two ESUs of Steelhead in Washington, Oregon, and California, 63 Fed. Reg. 13,347 (Mar. 19, 1998).

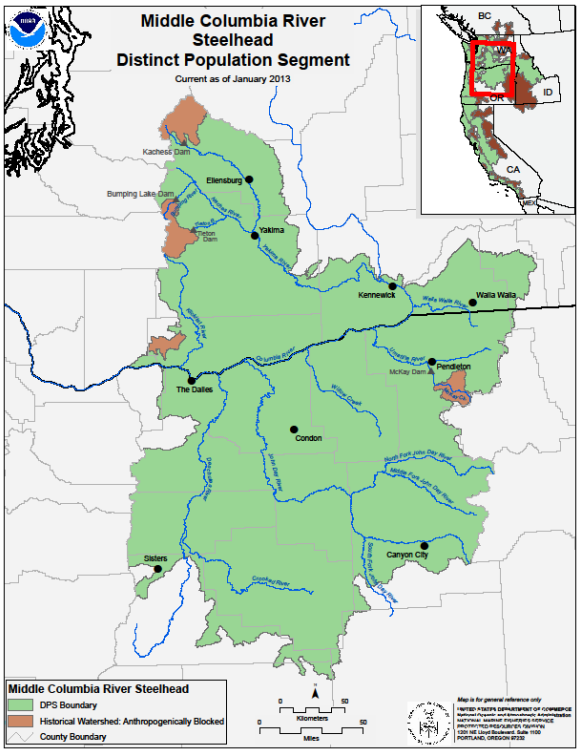
[142] NAT'L MARINE FISHERIES SERV., ESA RECOVERY PLAN FOR LOWER COLUMBIA RIVER COHO SALMON, LOWER COLUMBIA RIVER CHINOOK SALMON, COLUMBIA RIVER CHUM SALMON, AND LOWER COLUMBIA RIVER STEELHEAD ES-31–ES-32 (June 2013).

[143] NAT'L MARINE FISHERIES SERV., 2022 5-YEAR REVIEW: SUMMARY & EVALUATION OF LOWER COLUMBIA RIVER CHINOOK SALMON, COLUMBIA RIVER CHUM SALMON, LOWER COLUMBIA RIVER COHO SALMON, LOWER COLUMBIA RIVER STEELHEAD 33 (2022).

[144] NAT'L MARINE FISHERIES SERV., ESA RECOVERY PLAN FOR LOWER COLUMBIA RIVER COHO SALMON, LOWER COLUMBIA RIVER CHINOOK SALMON, COLUMBIA RIVER CHUM SALMON, AND LOWER COLUMBIA RIVER STEELHEAD 4-10–4-11 (2013).

treatment plant effluent, stormwater runoff, and nonpoint source pollution remains a growing concern."[145]

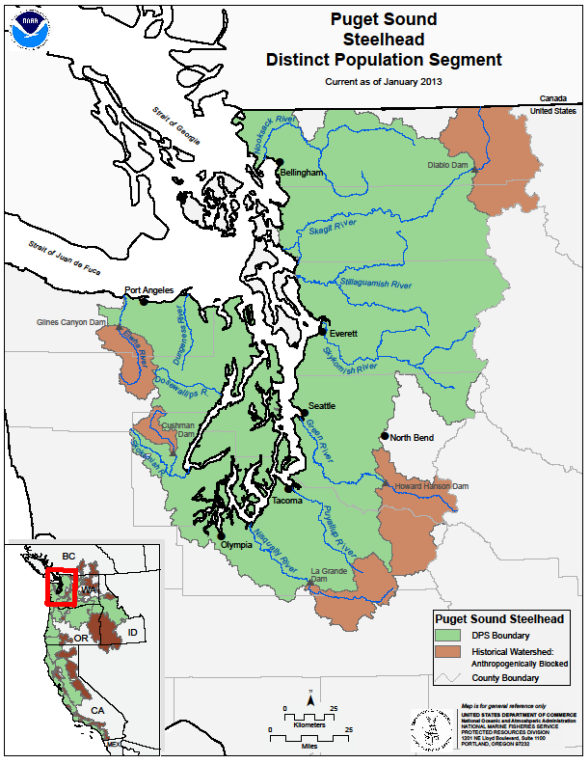
7. *Middle Columbia River Steelhead DPS (Threatened)*



The Middle Columbia River Steelhead DPS "includes all naturally spawned populations of steelhead in streams from above the Wind River, Washington, and the Hood River, Oregon (exclusive), upstream to, and including, the Yakima River, Washington, excluding steelhead from the Snake River Basin."[146] It was listed under the ESA as threatened in 1999.[147] Historically, there were 20 populations within the Middle Columbia River DPS, but three have already been extirpated.[148] The majority of the remaining populations "are rated at moderate risk," with three of the populations "at high risk of extinction within 100 years."[149] NMFS notes that "in general tributary habitat conditions are still degraded through past and present anthropogenic activities (levees, water withdrawals, roads, dams, etc.). These degraded habitat conditions continue to negatively affect Middle Columbia River steelhead abundance, productivity, spatial structure, and diversity. In addition, ongoing development and land-use activities may also have negative effects into the foreseeable future."[150]

[145] NAT'L MARINE FISHERIES SERV., 2022 5-YEAR REVIEW: SUMMARY & EVALUATION OF LOWER COLUMBIA RIVER CHINOOK SALMON, COLUMBIA RIVER CHUM SALMON, LOWER COLUMBIA RIVER COHO SALMON, LOWER COLUMBIA RIVER STEELHEAD 67 (2022).
[146] Endangered and Threatened Species: Final Listing Determinations for 10 Distinct Population Segments of West Coast Steelhead, 71 Fed. Reg. 834, 849 (Jan. 5, 2006).
[147] Endangered and Threatened Species: Threatened Status for Two ESUs of Steelhead in Washington and Oregon, 64 Fed. Reg. 14,517 (Mar. 25, 1999).
[148] NAT'L MARINE FISHERIES SERV., MIDDLE COLUMBIA RIVER STEELHEAD DISTINCT POPULATION SEGMENT ESA RECOVERY PLAN ES-xi (2009).
[149] *Id.* at ES-xvii.
[150] NAT'L MARINE FISHERIES SERV., 2022 5-YEAR REVIEW: SUMMARY & EVALUATION OF MIDDLE COLUMBIA RIVER STEELHEAD 19 (2022).

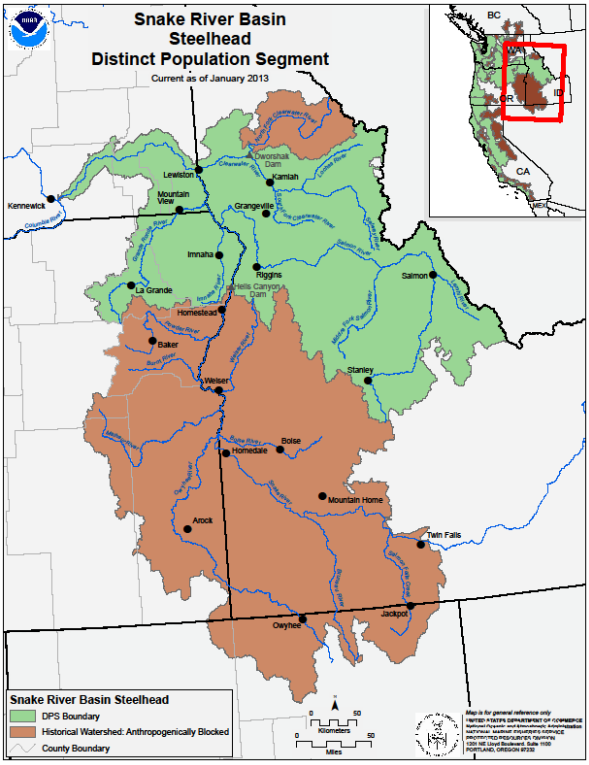
8. *Puget Sound Steelhead DPS (Threatened)*



The Puget Sound Steelhead DPS "includes all naturally spawned steelhead originating below natural and manmade impassable barriers in rivers flowing into Puget Sound from the Elwha River (inclusive) eastward, including rivers in Hood Canal, South Sound, North Sound, and the Strait of Georgia."[151] Historical abundance is unknown, but "commercial catch records and news articles indicated that 409,000 to 930,000 adult steelhead returned each year to Puget Sound at the end of the 19th Century."[152] This DPS was listed under the ESA as a threatened species in 2007,[153] and today the current abundance of Puget Sound Steelhead is estimated at less than 22,000 recruits/spawners.[154] NMFS notes that "[t]he loss of steelhead habitat in many areas of Puget Sound has been staggering, especially in those areas that have undergone extensive urban and residential development,"[155] and that "[u]rbanization and resulting increases in impervious surfaces also increase storm-water runoff during fall and winter months," which has "pollute[d] water quality, and contaminate[d] local aquatic systems."[156]

[151] NAT'L MARINE FISHERIES SERV., ESA RECOVERY PLAN FOR THE PUGET SOUND STEELHEAD DISTINCT POPULATION SEGMENT (*ONCORHYNCHUS MYKISS*) 13 (2019).
[152] *Id*. at 13.
[153] Endangered and Threatened Species: Final Listing Determination for Puget Sound Steelhead, 72 Fed. Reg. 26,722 (May 11, 2007).
[154] NAT'L MARINE FISHERIES SERV., ESA RECOVERY PLAN FOR THE PUGET SOUND STEELHEAD DISTINCT POPULATION SEGMENT (*ONCORHYNCHUS MYKISS*) 132–33 (2019).
[155] *Id*. at 32.
[156] *Id*. at 35.

9. *Snake River Basin Steelhead DPS (Threatened)*

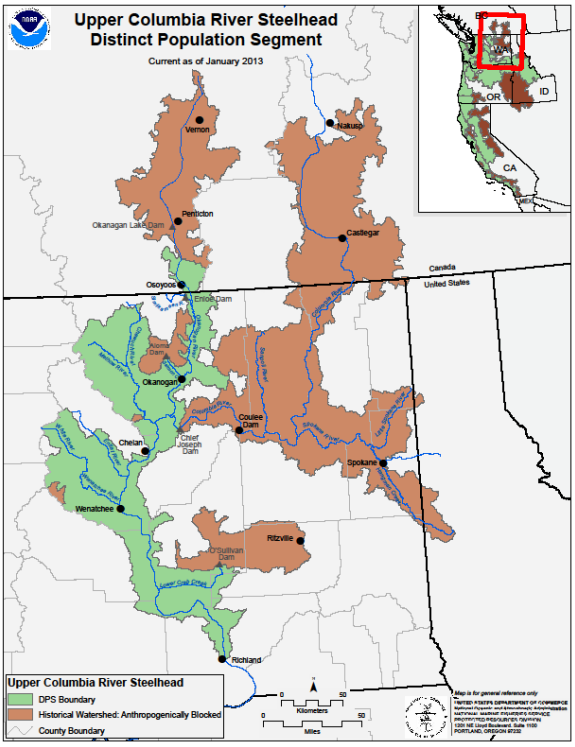


The Snake River Basin Steelhead DPS "includes all naturally spawned populations of steelhead in streams in the Snake River Basin of southeast Washington, northeast Oregon, and Idaho."[157] Historically, the Snake River is believed to have been the Columbia River basin's most productive drainage for steelhead, supporting 55 percent of summer steelhead.[158] "Previous accounts estimated annual adult returns of 40,000 to 60,000 steelhead above Lewiston Dam on the lower Clearwater River in the early 1960s, 15,000 and 4,000 steelhead to the Grande Ronde and Imnaha Rivers in the 1960s, and 3,000 steelhead to the Tucannon River in the mid-1950s. The Snake River steelhead run at Ice Harbor Dam in 1962 included 108,000 adults, and the run averaged approximately 70,000 adults annually until 1970."[159] Widespread habitat blockage from hydropower systems, habitat degradation, and flow impairment all led to a sharp decline in natural-origin returning steelhead,[160] and the population was listed under the ESA as threatened in 1997.[161] NMFS recognizes that impaired water quality, including toxic pollutant contamination, limits the viability of Snake River steelhead.[162]

[157] Endangered and Threatened Species: Final Listing Determinations for 10 Distinct Population Segments of West Coast Steelhead, 71 Fed. Reg. 834, 849 (Jan. 5, 2006).
[158] NAT'L MARINE FISHERIES SERV., ESA RECOVERY PLAN FOR SNAKE RIVER SPRING/SUMMER CHINOOK SALMON (*ONCORHYNCHUS TSHAWYTSCHA*) & *SNAKE RIVER BASIN STEELHEAD* (*ONCORHYNCHUS MYKISS*) 25 (2017).
[159] *Id*. at 30 (internal citations omitted).
[160] *Id*.
[161] Endangered and Threatened Species: Listing of Several Evolutionary Significant Units (ESUs) of West Coast Steelhead, 62 Fed. Reg. 43,937 (Aug. 18, 1997).
[162] NAT'L MARINE FISHERIES SERV., ESA RECOVERY PLAN FOR SNAKE RIVER SPRING/SUMMER CHINOOK SALMON (*ONCORHYNCHUS TSHAWYTSCHA*) & SNAKE RIVER BASIN STEELHEAD (*ONCORHYNCHUS MYKISS*) 126 tbl. 5-1 (2017).

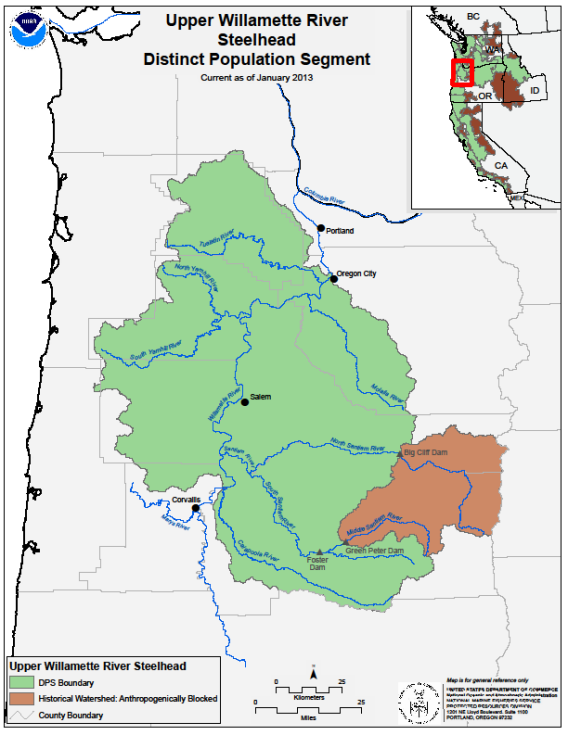
10. *Upper Columbia River Steelhead DPS (Threatened)*

The Upper Columbia River Steelhead DPS "includes all naturally spawned populations of steelhead in streams in the Columbia River Basin upstream from the Yakima River, Washington, to the U.S.-Canada border."[163] It was listed under the ESA as threatened in 2009,[164] and today none of the extant populations of Upper Columbia River Steelhead NMFS deems necessary for the species' recovery are viable, with all having a moderate to high risk of extinction.[165] NMFS notes that the habitat in the Columbia River estuary is degraded "as a result of past and current releases of toxic contaminants," including from urban stormwater runoff.[166]



[163] Endangered and Threatened Species: Final Listing Determinations for 10 Distinct Population Segments of West Coast Steelhead, 71 Fed. Reg. 834, 849 (Jan. 5, 2006).
[164] Listing Endangered and Threatened Species: Change in Status for the Upper Columbia River Steelhead Distinct Population Segment, 74 Fed. Reg. 42,605 (Aug. 24, 2009).
[165] NAT'L MARINE FISHERIES SERV', UPPER COLUMBIA SPRING CHINOOK SALMON AND STEELHEAD RECOVERY PLAN, at xxi (2007).
[166] *Id*. at 3-15.

11. *Upper Willamette River Steelhead DPS (Threatened)*



The Upper Willamette River Steelhead DPS "includes all naturally spawned populations of winter-run steelhead in the Willamette River, Oregon, and its tributaries upstream from Willamette Falls to the Calapooia River (inclusive)."[167] Historical abundance is not well documented, but steelhead are currently depressed relative to historic levels,[168] and the Upper Willamette River Steelhead DPS was listed under the ESA as threatened in 1999.[169] NMFS recognizes that "[u]rban and rural-residential development in the lower subbasins and the mainstem Willamette River floodplain has led to the degradation of riparian and floodplain conditions, as well as an alteration of the natural drainage network due to roads, ditches and impervious surfaces" within the habitat of the Upper Willamette River Steelhead DPS, and that these activities reduce water quality in the principle subbasins and mainstem Willamette River and "inhibit the amount and quality of spawning and rearing habitats."[170]

III. INCLUSION OF 6PPD IN TIRES CAUSES TAKE OF PROTECTED COHO SALMON, CHINOOK SALMON, AND STEELHEAD TROUT

As discussed above, toxic water contamination from stormwater represents a significant source of ongoing harm and a threat to the continued existence of these ESA-listed salmon and trout populations. Abundant scientific evidence now makes clear that your inclusion of 6PPD in tires that you manufacture and/or distribute is a leading cause of such toxic contamination. Your inclusion of 6PPD in tires therefore causes "take" of the above listed species of coho salmon, Chinook salmon, and steelhead trout, in violation of Section 9 of the ESA, 16 U.S.C. § 1538(a)(1)(B); 50 C.F.R. § 223.203.

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[167] Endangered and Threatened Species: Final Listing Determinations for 10 Distinct Population Segments of West Coast Steelhead, 71 Fed. Reg. 834, 849 (Jan. 5, 2006).
[168] OR. DEP'T OF FISH & WILDLIFE AND NAT'L MARINE FISHERIES SERV., UPPER WILLAMETTE RIVER CONSERVATION AND RECOVERY PLAN FOR CHINOOK SALMON AND STEELHEAD 4-5 (2011).
[169] Endangered and Threatened Species: Threatened Status for Two ESUs of Steelhead in Washington and Oregon, 64 Fed. Reg. 14,517 (Mar. 25, 1999).
[170] OR. DEP'T OF FISH & WILDLIFE AND NAT'L MARINE FISHERIES SERV., UPPER WILLAMETTE RIVER CONSERVATION AND RECOVERY PLAN FOR CHINOOK SALMON AND STEELHEAD 5-11 (2011).

6PPD is used in most if not all tires, and it is designed to react with ground-level ozone to increase tire lifespan.[171] 6PPD contained in tires migrates over the life of the tire to the tire surface to supply a continual source and discharge of 6PPD pollutants, with the amount of 6PPD in the tire decreasing over time.[172] When 6PPD reacts with ozone, it creates 6PPD-q.[173] This 6PPD-q is then deposited on roadways and other impervious surfaces such as parking surfaces, where it is discharged during storm events into the aquatic habitats of the species discussed above.[174]

6PPD-q is acutely toxic to coho salmon, Chinook salmon, and steelhead trout.[175] When exposed to 6PPD-q, all three species demonstrate a characteristic pattern of symptomatic behavior, including "circling, surface gaping, and equilibrium loss," followed by death.[176]

For coho salmon, the lethal concentration of 6PPD-q required to kill 50% of test animals ("LC_{50}") is estimated to be between 41 to 95 nanograms per liter ("ng/L") (or .041–.095

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[171] Ximin Hu et al., *Transformation Product Formation upon Heterogeneous Ozonation of the Tire Rubber Antioxidant 6PPD (N-(1,3-dimethylbutyl)-N'-phenyl-p-phenylenediamine)*, 9 ENVTL. SCI. & TECH. LETTERS 413 (2022).

[172] CAL. DEP'T OF TOXIC SUBSTANCES CONTROL, PRODUCT-CHEMICAL PROFILE FOR MOTOR VEHICLE TIRES CONTAINING N-(1,3-DIMETHYLBUTYL)-N'-PHENYL-P-PHENYLENEDIAMINE (6PPD), 4–5 (2022).

[173] *Id*. at 13.

[174] Zhenyu Tian et al., *A Ubiquitous Tire Rubber-Derived Chemical Induces Acute Mortality in Coho Salmon*, 371 SCIENCE 185 (2021); CAL. DEP'T OF TOXIC SUBSTANCES CONTROL, PRODUCT-CHEMICAL PROFILE FOR MOTOR VEHICLE TIRES CONTAINING N-(1,3-DIMETHYLBUTYL)-N'-PHENYL-P-PHENYLENEDIAMINE (6PPD), 33–34 (2022).

[175] Zhenyu Tian et al., *A Ubiquitous Tire Rubber-Derived Chemical Induces Acute Mortality in Coho Salmon*, 371 SCIENCE 185 (2021); Zhenyu Tian et al., *6PPD-Quinone: Revised Toxicity Assessment and Quantification with a Commercial Standard*, 9 ENVTL. SCI. & TECH. LETTERS 140 (2022); Jenifer K. McIntyre et al., *Treading Water: Tire Wear Particle Leachate Recreates an Urban Runoff Mortality Syndrome in Coho but Not Chum Salmon*, 55 ENVTL. SCI. & TECH. 11767 (2021); Markus Brinkmann et al., *Acute Toxicity of the Tire Rubber-Derived Chemical 6PPD-quinone to Four Fishes of Commercial, Cultural, and Ecological Importance*, 9 ENVTL. SCI. & TECH. LETTERS 333 (2022); B.F. French et al., *Urban Roadway Runoff Is Lethal to Juvenile Coho, Steelhead, and Chinook Salmonids, But Not Congeneric Sockeye*, 9 ENVTL. SCI. & TECH. LETTERS 733 (2022); Bonnie P. Lo et al., *Acute Toxicity of 6PPD-quinone to Early Life Stage Juvenile Chinook (Oncorhynchus tshawytscha) and Coho (Oncorhynchus kisutch) Salmon*, 42 ENVTL. TOXICOL. CHEM. 815 (2023).

[176] Zhenyu Tian et al., *A Ubiquitous Tire Rubber-Derived Chemical Induces Acute Mortality in Coho Salmon*, 371 SCIENCE 185, 185 (2021); Markus Brinkmann et al., *Acute Toxicity of the Tire Rubber-Derived Chemical 6PPD-quinone to Four Fishes of Commercial, Cultural, and Ecological Importance*, 9 ENVTL. SCI. & TECH. LETTERS 333, 336 (2022); Bonnie P. Lo et al., *Acute Toxicity of 6PPD-quinone to Early Life Stage Juvenile Chinook (Oncorhynchus tshawytscha) and Coho (Oncorhynchus kisutch) Salmon*, 42 ENVTL. TOXICOLOGY & CHEMISTRY 815, 815 (2023).

micrograms per liter ("µg/L")).[177] This toxicity level suggests that 6PPD-q "is among the most toxic chemicals known for aquatic organisms, at least to coho salmon."[178] In one experiment where juvenile coho salmon were exposed for 24 hours to untreated urban runoff, the fish "began dying soon during exposure (2–4 [hours]), with near-maximal cumulative mortality within 8 [hours]."[179] Even when this urban runoff was diluted 95% with clean water, exposure to the diluted stormwater was generally lethal to coho.[180] And even when coho were transferred to clean water after exposure to 6PPD-q, they did not recover.[181]

6PPD-q is also acutely toxic to rainbow and steelhead trout. The LC_{50} for rainbow trout (the freshwater resident strain of ocean-going steelhead) exposed to 6PPD-q is estimated to be 1.00 µg/L after 72–96 hours.[182] Scientists believe the life history differences between rainbow trout and steelhead trout "(i.e., freshwater residence vs ocean migration) is not a determinant of susceptibility [to 6PPD-q],"[183] meaning steelhead trout are likely to experience similar levels of mortality. When exposed to untreated stormwater runoff from three different storms, steelhead trout experienced 4%–42% mortality and generally died within 1–2 days of exposure.[184]

Finally, Chinook salmon are also vulnerable to 6PPD-q exposure. The LC_{50} value has not been precisely determined, but the LC_{25} estimate for juvenile Chinook salmon exposed to 6PPD-q is 43,699 ng/L (43.699 µg/L).[185] When exposed to untreated stormwater runoff from three different storms, Chinook salmon suffered up to 13% mortality, and generally died within 1–2

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[177] Bonnie P. Lo et al., *Acute Toxicity of 6PPD-quinone to Early Life Stage Juvenile Chinook (Oncorhynchus tshawytscha) and Coho (Oncorhynchus kisutch) Salmon*, 42 ENVTL. TOXICOLOGY & CHEMISTRY 815, 819 (2023); Zhenyu Tian et al., *6PPD-Quinone: Revised Toxicity Assessment and Quantification with a Commercial Standard*, 9 ENVTL. SCI. & TECH. LETTERS 140, 143 (2022).

[178] Zhenyu Tian et al., *6PPD-Quinone: Revised Toxicity Assessment and Quantification with a Commercial Standard*, 9 ENVTL. SCI. & TECH. LETTERS 140, 143 (2022).

[179] B.F. French, et al., *Urban Roadway Runoff Is Lethal to Juvenile Coho, Steelhead, and Chinook Salmonids, But Not Congeneric Sockeye*, 9 ENVTL. SCI. & TECH. LETTERS 733, 735 (2022).

[180] *Id*. at 736.

[181] *Id*. at 735.

[182] Markus Brinkmann et al., *Acute Toxicity of the Tire Rubber-Derived Chemical 6PPD-quinone to Four Fishes of Commercial, Cultural, and Ecological Importance,* 9 Envtl. Sci. & Tech. Letters 333, 336 (2022).

[183] B.F. French et al., *Urban Roadway Runoff Is Lethal to Juvenile Coho, Steelhead, and Chinook Salmonids, But Not Congeneric Sockeye*, 9 ENVTL. SCI. & TECH. LETTERS 733, 736 (2022).

[184] *Id*. at 733.

[185] Bonnie P. Lo et al., *Acute Toxicity of 6PPD-quinone to Early Life Stage Juvenile Chinook (Oncorhynchus tshawytscha) and Coho (Oncorhynchus kisutch) Salmon*, 42 Envtl. Toxicology & Chemistry 815, 820 (2023).

days of exposure.[186] There are also likely sublethal effects for Chinook salmon from exposure to 6PPD-q.[187]

6PPD-q is "ubiquitous" in urban runoff and surface waters,[188] and has been repeatedly found in concentrations above the levels known to kill coho and steelhead trout.[189] For instance, 6PPD-q was detected in Los Angeles region roadway runoff at 4.1 to 6.1 µg/L; in San Francisco region creeks at 1.0 to 3.5 µg/L; and in Seattle-region watersheds from .3 to 3.2 µg/L.[190]

For all populations of coho salmon, steelhead trout, and Chinook salmon described above, NMFS has identified stormwater runoff into their habitat as a threat. Current stormwater practices are generally insufficient to remove 6PPD-q,[191] with most urban stormwater discharged

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[186] B.F. French et al., *Urban Roadway Runoff Is Lethal to Juvenile Coho, Steelhead, and Chinook Salmonids, But Not Congeneric Sockeye*, 9 ENVTL. SCI. & TECH. LETTERS 733, 733 (2022).

[187] *C.f.*, Justin Greer et al., *Tire-Derived Transformation Product 6PPD-Quinone Induces Mortality and Transcriptionally Disrupts Vascular Permeability Pathways in Developing Coho Salmon*, ENV'T. SCI. & TECH. (forthcoming 2023) (indicating that 6PPD-q exposure "induces reductions in survival and fitness of progeny that represent a substantial concern for urban spawning coho salmon populations").

[188] Lixi Zeng et al., *Widespread Occurrence and Transport of p-Phenylenediamines and Their Quinones in Sediments across Urban Rivers, Estuaries, Coasts, and Deep-Sea Regions*, 57 ENVTL. SCI. & TECH. 2393, 2397 (2023); Cassandra Johannessen et al., *Detection of selected tire wear compounds in urban receiving waters*, 287 ENVTL. POLLUTION (2021); Jenifer K. McIntyre et al., *Treading Water: Tire Wear Particle Leachate Recreates an Urban Runoff Mortality Syndrome in Coho but Not Chum Salmon*, 55 ENVTL. SCI. & TECH. 11767, 11772 (2021).

[189] Cassandra Johannessen, et al., *The Tire Wear Compounds 6PPD-Quinone and 1,3-Diphenylguanidine in an Urban Watershed*, 82 ARCHIVES OF ENVTL. CONTAMINATION & TOXICOLOGY 171 (2022); J.K. Challis et al., *Occurrences of Tire Rubber-Derived Contaminants in Cold-Climate Urban Runoff*, 8 ENVTL. SCI. & TECH. LETTERS 961 (2021); Lixi Zeng et al., *Widespread Occurrence and Transport of p-Phenylenediamines and Their Quinones in Sediments across Urban Rivers, Estuaries, Coasts, and Deep-Sea Regions*, 57 ENVTL. SCI. & TECH. 2393 (2023); Zhenyu Tian et al., *A Ubiquitous Rire Rubber-Derived Chemical Induces Acute Mortality in Coho Salmon*, 371 SCIENCE 185 (2021); B.F. French et al., *Urban Roadway Runoff Is Lethal to Juvenile Coho, Steelhead, and Chinook Salmonids, But Not Congeneric Sockeye*, 9 ENVTL. SCI. & TECHN. LETTERS 733 (2022); Zhenyu Tian et al., *6PPD-Quinone: Revised Toxicity Assessment and Quantification with a Commercial Standard*, 9 ENVTL. SCI. & TECH. LETTERS 140 (2022).

[190] Zhenyu Tian et al., *A Ubiquitous Tire Rubber-Derived Chemical Induces Acute Mortality in Coho Salmon*, 371 SCIENCE 185, 187 (2021).

[191] CAL. DEP'T OF TOXIC SUBSTANCES CONTROL, PRODUCT-CHEMICAL PROFILE FOR MOTOR VEHICLE TIRES CONTAINING N-(1,3-DIMETHYLBUTYL)-N'-PHENYL-P-PHENYLENEDIAMINE (6PPD), 44 (2022); Bettina Seiwert et al., *Abiotic Oxidative Transformation of 6-PPD and 6-PPD Quinone from Tires and Occurrence of Their Products in Snow from Urban Roads and in Municipal Wastewater*, 212 WATER RESEARCH (2022).

to aquatic ecosystems without treatment.[192] Given 6PPD-q's ubiquity and lack of regulation and treatment, stormwater runoff containing 6PPD-q reaches and harms these ESA-protected populations and pollutes their habitat. This discharge of toxic 6PPD-q from your tires into ESA-protected coho salmon, steelhead trout, and Chinook salmon habitat harms, harasses, wounds, and kills, and therefore unlawfully "takes" individual coho, Chinook salmon, and steelhead within the meaning of Section 9 of the ESA. *See* 16 U.S.C. §§ 1538(a)(1)(B), 1532(19); 50 C.F.R. § 222.102.

The discharge of 6PPD-q from your tires also has large-scale impacts in violation of Section 9. 6PPD-q has recently been identified as the cause of "urban runoff mortality syndrome" observed for decades in coho salmon in urban waterways.[193] Starting in the 1980s,[194] researchers observed the same abnormal behaviors now known to be characteristic of 6PPD-q exposure in coho salmon returning to spawn in Puget Sound, Washington.[195] Surveys of returning coho salmon also revealed premature spawner mortality rates ranging from 60–100% in urban waterways, whereas the comparable rate in non-urban streams was <1%.[196] Researchers later confirmed that this urban runoff mortality syndrome behavior and mortality was not limited to adult coho salmon, and noted that "lower abundances of juvenile coho have been observed in urban watersheds compared to non-urban ones."[197] Researchers have concluded that "[w]ild coho populations cannot withstand the high rates of mortality that are now regularly occurring in

[192] CAL. DEP'T OF TOXIC SUBSTANCES CONTROL, PRODUCT-CHEMICAL PROFILE FOR MOTOR VEHICLE TIRES CONTAINING N-(1,3-DIMETHYLBUTYL)-N'-PHENYL-P-PHENYLENEDIAMINE (6PPD), 63 (2022).

[193] Zhenyu Tian et al., *A Ubiquitous Tire Rubber-Derived Chemical Induces Acute Mortality in Coho Salmon*, 371 SCIENCE 185 (2021); Jenifer K. McIntyre et al., *Treading Water: Tire Wear Particle Leachate Recreates an Urban Runoff Mortality Syndrome in Coho but Not Chum Salmon*, 55 ENVTL. SCI. & TECH. 11767 (2021).

[194] WILL KENDRA & ROGER WILLMS, RECURRENT COHO SALMON MORTALITY AT MARITIME HERITAGE FISH HATCHERY, BELLINGHAM: A SYNTHESIS OF DATA COLLECTED FROM 1987–1989 (1990).

[195] Nathaniel L. Scholz et al., *Recurrent Die-Offs of Adult Coho Salmon Returning to Spawn in Puget Sound Lowland Urban Streams*, 6 PLOS ONE 1 (2011).

[196] *Id.*; Michelle I. Chow et al., *An Urban Stormwater Runoff Mortality Syndrome in Juvenile Coho Salmon*, 214 AQUATIC TOXICOLOGY 1, 7 (2019); Blake E. Feist et al., *Roads to Ruin: Conservation Threats to a Sentinel Species Across an Urban Gradient* 27 ECOLOGICAL APPLICATIONS 2382, 2393 (2018).

[197] Michelle I. Chow et al., *An Urban Stormwater Runoff Mortality Syndrome in Juvenile Coho Salmon*, 214 AQUATIC TOXICOLOGY 1, 9 (2019) (citing J.B. Scott et al., *Effects of Urban Development on Fish Population Dynamics in Kelsey Creek, Washington*, 115 TRANSACTIONS AM. FISHERIES SOC'Y 555 (1986) and C.W. May et al., *Effects of Urbanization on Small Streams in the Puget Sound Ecoregion*, 2 WATERSHED PROT. TECHNIQUES 483 (1997).).

urban spawning habitats,"[198] and that "it will be difficult, if not impossible to reverse historical coho declines without addressing the toxic pollution dimension of freshwater habitats."[199]

In addition to large-scale harm to coho documented in Washington state, California state officials similarly believe that 6PPD-q generated from 6PPD-containing tires may have been responsible for historic declines of coho salmon in California, and may likewise jeopardize recovery of coho salmon populations in that state.[200] As discussed above, coho salmon populations in California are estimated to be less than 6% of their levels in the 1940s, with a 70% decline since the 1960s.[201] California's Department of Toxic Substances Control ("CA DTSC") explains that "[t]he 30-year period from the 1960s to the 1990s, during which [there was a documented] 70% decline in coho, corresponds with the use of 6PPD in tires," and finds it "notable that during this period coho were extirpated from the San Francisco Bay Area, which arguably has the highest concentration of vehicle traffic in coho territory within California."[202] CA DTSC concludes that "[t]he presence of 6PPD-quinone in California's waterways continues to threaten the state's remaining coho salmon populations and may jeopardize the recovery of this species."[203]

IV. CONCLUSION

The loss of salmon and steelhead populations has already significantly diminished the commercial and recreational fisheries of the West Coast, and these depleted populations cannot withstand the continued toxic assault from 6PPD-q. The ESA authorizes citizen suits to enjoin violations of the ESA. 16 U.S.C. § 1540(g)(1)(a). As set forth above, you are in violation of Section 9 of ESA for take of ESA-protected species of coho salmon, Chinook salmon, and

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[198] Julann A. Spromberg et al., *Coho Salmon Spawner Mortality in Western U.S. Urban Watersheds: Bioinfiltration Prevents Lethal Storm Water Impacts*, 53 J. APPLIED ECOLOGY 398, 398 (2016).

[199] Blake E. Feist et al., *Roads to Ruin: Conservation Threats to a Sentinel Species Across an Urban Gradient*, 27 ECOLOGICAL APPLICATIONS 2382, 2390 (2018); *see also* Julann A. Spromberg & Nathaniel L. Scholz, *Estimating the Future Decline of Wild Coho Salmon Populations Resulting from Early Spawner Die-Offs in Urbanizing Watersheds of the Pacific Northwest, USA*, 7 INTEGRATED ENVTL. ASSESSMENT & MGMT. 648, 655 (2011).

[200] CAL. DEP'T OF TOXIC SUBSTANCES CONTROL, PRODUCT – CHEMICAL PROFILE FOR MOTOR VEHICLE TIRES CONTAINING N-(1,3-DIMETHYLBUTYL)-N'-PHENYL-P-PHENYLENEDIAMINE (6PPD), 6 (2022).

[201] Larry R. Brown et al., *Historical Decline and Current Status of Coho Salmon in California*, 14(2) N. AM. J. FISHERIES MGMT. 237,250 (1994).

[202] CAL. DEP'T OF TOXIC SUBSTANCES CONTROL, PRODUCT – CHEMICAL PROFILE FOR MOTOR VEHICLE TIRES CONTAINING N-(1,3-DIMETHYLBUTYL)-N'-PHENYL-P-PHENYLENEDIAMINE (6PPD), 48 (2022) (citing Larry R. Brown et al., *Historical Decline and Current Status of Coho Salmon in California*, 14 N. AM. J. FISHERIES MGMT. 237, 250 (1994)).

[203] CAL. DEP'T OF TOXIC SUBSTANCES CONTROL, PRODUCT – CHEMICAL PROFILE FOR MOTOR VEHICLE TIRES CONTAINING N-(1,3-DIMETHYLBUTYL)-N'-PHENYL-P-PHENYLENEDIAMINE (6PPD), 6 (2022).

steelhead trout for the discharge of 6PPD-q into these species' habitats. If you do not cease unauthorized take of these species within 60 days, we plan to seek redress through litigation.

Sincerely,

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