

# Global Warming Impacts on U.S. Fish Stocks

U.S.D.A. Assessment

The final draft of a U.S. Department of Agriculture report scheduled for release Tuesday, May 27, predicts that climate change will seriously damage fish habitat, with potentially major impacts on the sport and commercial fishing industries. The full draft is available online at: <http://www.climatescience.gov/Library/sap/sap4-3/default.php>

The report estimates that in the next 30 years, CO<sub>2</sub> concentrations are expected to have increased about 60 ppm, from today's 380 ppm to about 440 ppm, and temperatures over the contiguous United States are expected to have increased by an average of 2.2 degrees Fahrenheit.<sup>1</sup>

Impacts to fish habitat include:

- **Declining Salmon Runs:** The report says that warmer water lowers overall salmon survival rates and make young salmon more vulnerable to predators.<sup>2</sup> *"With increasing temperatures, streams and rivers currently supporting salmonids may become inhospitable as temperatures cross critical thresholds."*<sup>3</sup> In a separate example of salmon decline, Federal fishery officials recently cancelled the entire 2008 sport and commercial fishing season from California to Northern Oregon.<sup>4</sup> In the Sacramento River alone, estimates of the fall salmon run projected 54,000 returning adults. A minimum of 122,000 to 180,000 are needed for a healthy fishing season.<sup>5</sup>
- **Dwindling Rivers:** Rivers and streams will be damaged by a combination of lower water flows, higher water temperatures, silting from erosion and non-native plant invasions. *"Riparian ecosystems will likely contract, and in the remainder, aquatic ecosystems will be less tolerant of stress. The combination of increased droughts and floods, land use and land cover change, and human water demand will amplify these impacts and promote sedimentation."*<sup>6</sup> In a separate example of climate change impacts, high stream temperatures and low water flows prompted

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<sup>1</sup> U.S. Dept. of Agriculture, "The Effects of Climate Change on Agriculture, Land Resources, Water Resources, and Biodiversity;" final draft, Mar. 5, 2008; p. 31, [www.climatescience.gov/Library/sap/sap4-3/default.php](http://www.climatescience.gov/Library/sap/sap4-3/default.php)

<sup>2</sup> U.S. Dept. of Agriculture, "The Effects of Climate Change on Agriculture, Land Resources, Water Resources, and Biodiversity;" final draft, Mar. 5, 2008; p. 167, [www.climatescience.gov/Library/sap/sap4-3/default.php](http://www.climatescience.gov/Library/sap/sap4-3/default.php)

<sup>3</sup> U.S. Dept. of Agriculture, "The Effects of Climate Change on Agriculture, Land Resources, Water Resources, and Biodiversity;" final draft, Mar. 5, 2008; p. 177, [www.climatescience.gov/Library/sap/sap4-3/default.php](http://www.climatescience.gov/Library/sap/sap4-3/default.php)

<sup>4</sup> Pacific Fishery Management Council, Salmon Management Measures Adopted by the Council for 2008 Ocean Salmon Fisheries, [http://www.pcouncil.org/salmon/salprell108/table1\\_prell108.pdf](http://www.pcouncil.org/salmon/salprell108/table1_prell108.pdf)

<sup>5</sup> California Dept. of Fish and Game, "Salmon Fishery Changes—News & FAQ," May 2, 2008, <http://www.dfg.ca.gov/news/issues/salmon/#01>

<sup>6</sup> U.S. Dept. of Agriculture, "The Effects of Climate Change on Agriculture, Land Resources, Water Resources, and Biodiversity;" final draft, Mar. 5, 2008, p. 150, [www.climatescience.gov/Library/sap/sap4-3/default.php](http://www.climatescience.gov/Library/sap/sap4-3/default.php)

Montana state fishery officials in July and August 2007 to ban or restricted fishing on 29 rivers.<sup>7</sup>

- **Warmer Lakes; Fewer Fish:** The report estimates that with warming temperatures, the ranges of cool-water and cold-water fish could shift nationwide. Historically suitable habitat for cold-water fish could be reduced by 45 percent, and 30 percent for cool-water fish. Shallow and medium-depth lakes, approximately 13 to 43 feet deep, would be most affected. In addition, the report states: “*Warmer temperatures will also enhance algal production and most likely the growth of nuisance species, such as blue-green algae.*”<sup>8</sup>
- **Floods and Pollution:** The report warns, “*In general, an increase in extreme events will likely reduce water quality in substantial ways. More frequent floods and prolonged low flows would be expected to induce water quality problems through episodic flushing of accumulated nutrients/toxins on the landscape followed by their retention in water bodies.*”<sup>9</sup>

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<sup>7</sup> State of Montana, Department of Fish, Wildlife and Parks, “Restrictions and Closures,” <http://fwp.mt.gov/fishing/guide/waterclosure.aspx>

<sup>8</sup> U.S. Dept. of Agriculture, “The Effects of Climate Change on Agriculture, Land Resources, Water Resources, and Biodiversity,” final draft, Mar. 5, 2008; p. 177, [www.climatescience.gov/Library/sap/sap4-3/default.php](http://www.climatescience.gov/Library/sap/sap4-3/default.php)

<sup>9</sup> U.S. Dept. of Agriculture, “The Effects of Climate Change on Agriculture, Land Resources, Water Resources, and Biodiversity,” final draft, Mar. 5, 2008; p. 178, [www.climatescience.gov/Library/sap/sap4-3/default.php](http://www.climatescience.gov/Library/sap/sap4-3/default.php)