

Interim Targets – TOXICS IN FISH

Toxics in Fish		2014	2016	2018	2020
Progress Milestones and 2020 Target	<p><u>PCBs</u></p> <ul style="list-style-type: none"> improve 20%¹ from 1999-2010 conditions in herring from central and south Sound. meet targets for north sound herring improve 20% from historical conditions through 2008 in English sole from urban locations meet targets for non-urban E. sole <p><u>PBDEs</u></p> <ul style="list-style-type: none"> meet targets for north PS herring & non-urban E. sole improve 50% from 1999-2010 conditions for herring from central and south Puget Sound improve 50% from conditions through 2008 in urban E. sole <p><u>PAH-related conditions</u></p> <ul style="list-style-type: none"> meet targets for E. sole from non-urban locations and herring from north Sound meet targets for urban E. sole improve 30% from 1999-2010 conditions for herring from central and south Sound <p><u>Reproductive impairment</u>²</p> <ul style="list-style-type: none"> monitoring of impairment of English sole is initiated 	<p><u>PCBs</u></p> <ul style="list-style-type: none"> 10% improved from 2014 conditions in central and south Sound herring 10% improved from 2014 conditions in English sole from urban locations continuing to meet targets for non-urban E. sole <p><u>PBDEs</u></p> <ul style="list-style-type: none"> meet targets for north PS herring & non-urban E. sole improve 25% from 2014 conditions for herring from central and south Puget Sound improve 25% from 2014 conditions for urban E. sole <p><u>PAH-related conditions</u></p> <ul style="list-style-type: none"> continue to meet targets for E. sole from all locations 10% improved from 2014 conditions for herring <p><u>Reproductive impairment</u></p> <ul style="list-style-type: none"> reproductive impairment trends identified 	<p><u>PCBs</u></p> <ul style="list-style-type: none"> At least 80% of samples of herring and English sole meet targets 80% of sampled adult salmon and steelhead³ meet thresholds <p><u>PBDEs</u></p> <ul style="list-style-type: none"> all sampled herring, E. sole and adult salmon and steelhead meet thresholds <p><u>PAH-related conditions</u></p> <ul style="list-style-type: none"> prevalence of PAH-related liver disease is less than 5% in all sampled English sole 100% of herring samples are below PAH-related thresholds <p><u>Reproductive impairment</u></p> <ul style="list-style-type: none"> 50% improved from 2016 conditions in English sole 	<p>By 2020, toxics in fish are below threshold levels. Target is achieved if each of the following conditions is observed in monitoring results from 2019 or 2020:</p> <ul style="list-style-type: none"> Bioaccumulative toxics – 95 percent of samples⁴ meet the following thresholds: <ul style="list-style-type: none"> ❖ Concentrations of PCBs and PBDEs in Puget Sound herring, English sole, salmon and steelhead are below adverse effects thresholds (e.g., 2,400 ng PCB/g lipid and 1,400 ng PBDE/g lipid). ❖ Concentrations of PCBs and other bioaccumulative toxics in Puget Sound herring, English sole, salmon, and steelhead are below human-health screening levels (e.g., Department of Health screening levels for recreational or subsistence consumption rates, currently 33 ng PCB/g and 10 ng PCB/g fish tissue, respectively for a non-cancer endpoint). PAHs and endocrine disrupting compounds – all samples⁵ meet the following thresholds: <ul style="list-style-type: none"> ❖ English sole in Puget Sound exhibit no PAH-related liver disease. ❖ English sole in Puget Sound exhibit no toxics-related reproductive impairment. ❖ PAHs in herring are below an effects threshold 	
	Outputs	<ul style="list-style-type: none"> Source control portions of contaminated sediment site clean up are underway for all sites in Sinclair Inlet and Elliott and Commencement bays⁶ (C9.2 ongoing programs) (EPA) Legacy pollutant removal projects are funded or underway (C2.3 	<ul style="list-style-type: none"> Contaminated sediment site remedial actions underway in urban bays¹³ (C9.2 ongoing programs) (EPA & Ecology) Reductions in toxic chemical discharge in stormwater¹⁴ (stormwater permites) (EPA) 6.8 million pounds reduction 	<ul style="list-style-type: none"> Improved sediment quality at all contaminated sediment sites in Puget Sound marine waters¹⁵ (C9.2 key ongoing program activities) (Ecology & EPA) Reduced toxic chemical loading to Puget Sound as a 	

Toxics in Fish			
	<p>NTA3) (Ecology and public & private entities managing stormwater systems)</p> <ul style="list-style-type: none"> • Reductions in toxic chemical discharge in stormwater from stormwater permittees' source control programs⁷ (C2.4 ongoing programs) (Phase 1 permittees) • High priority stormwater retrofit projects identified (C2.3 NTA1) (Ecology) • 6.8 million pounds reduction in statewide hazardous material use per year⁸ (C1.4 and C1.6 ongoing programs) (Ecology) • 5 million pounds reduction in statewide generation of hazardous waste per year⁹ (C1.4 and C1.6 ongoing programs) (Ecology) • Diesel soot emissions in Puget Sound counties reduced to 2,870 tons in the year ending June 2014.¹⁰ (C1.3 ongoing programs) (Ecology) • Sources of endocrine disruption in juvenile Chinook sampled from Skagit, Snohomish, and South Puget Sound are characterized¹¹ (C1.1 NTA 6) (Ecology) • Identify specific chemicals causing endocrine disruption in Puget Sound fish (C1.1 NTA6) (Ecology) • Accurate fish consumption rates established ¹² (C1.1 NTA3) (Ecology) 	<p>in statewide hazardous material use per year (C1.4 and C1.6 ongoing programs) (Ecology)</p> <ul style="list-style-type: none"> • 5 million pounds reduction in statewide generation of hazardous waste per year (C1.4 and C1.6 ongoing programs) (Ecology) • Diesel soot emissions in Puget Sound counties reduced to 2,660 tons in the year ending June 2016. (C1.3 ongoing programs) (Ecology) 	<p>result of WWTP upgrades (C6.3 ongoing programs) and stormwater retrofits (C2.3 ongoing programs) (Local jurisdictions & Ecology)</p> <ul style="list-style-type: none"> • 6.8 million pounds reduction in statewide hazardous material use per year (C1.4 and C1.6 ongoing programs) (Ecology) • 5 million pounds reduction in statewide generation of hazardous waste per year (C1.4 and C1.6 ongoing programs) (Ecology) • Diesel soot emissions in Puget Sound counties reduced to 2,500 tons in the year ending June 2018. (C1.3 ongoing programs) (Ecology)

¹ "improve xx%" refers to a proportion of the progress needed to move from the conditions reported for a prior period. Assumes: Toxics control work underway in Puget Sound will lead to measurable reductions in fish contamination and harm as early as 2014; (2) Interim targets for 2014 may not be met because (i) bay-specific strategies may be needed and would not be adjusted to this target until 2013 or later and (ii) sediment and water column improvements will not immediately translate to improved conditions in fish.

² Reproductive impairment (endocrine disruption) measures in English sole are not among the funded ongoing studies for WDFW or its collaborators.

³ Monitoring of bioaccumulative toxic chemicals in adult salmon and steelhead is not among the funded studies of WDFW and its collaborators.

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- ⁴ Indicator lead recommends adjusting this to “80 to 90 percent of samples” given the small number of composite samples that expected to be evaluated in 2020.
- ⁵ Indicator lead recommends adjusting this to “95 percent of samples” which is the “normal” background prevalence of liver disease non-urban areas of Puget Sound.
- ⁶ Assumes: Source control to address ongoing loading of the contaminants driving remediation is an essential step of contaminated site clean up that will be needed to improve conditions in urban bays.
- ⁷ Assumes: Monitoring the effectiveness of source control programs is implemented as one of the areas of focus of “testing the effectiveness of non-structural ... and programmatic approaches used in stormwater management programs.”
- ⁸ The Department of Ecology reports statewide “pounds of hazardous materials reduced (in millions)” as a measure of its activity to “reduce the generation of hazardous waste and the use of toxic substances through technical assistance.” Actual annual reductions reported (statewide) during state fiscal years 2008 through 2012 ranged from 3 to 7.2 million pounds. (Total amount of statewide hazardous material use is not reported.) Ecology’s goals in recent years have been for reductions of 6.5 to 6.8 million pounds per year. As of late September 2012 Ecology has not published goals for timeframes beyond state fiscal year 2013.
- ⁹ The Department of Ecology reports statewide “pounds of hazardous waste generated (in millions)” as a measure of its activity to “reduce the generation of hazardous waste and the use of toxic substances through technical assistance.” Actual annual amounts of hazardous waste generated (statewide) during state fiscal years 2008 through 2012 ranged from 94 to 122 million pounds. Ecology’s goals in recent years have been for reductions of 4 to 5 million pounds per year. As of late September 2012, Ecology has not published goals for timeframes beyond state fiscal year 2013.
- ¹⁰ The Department of Ecology reports “tons of diesel soot emissions produced in counties contiguous to Puget Sound” as a measure of its activity to “reduce risk from toxic air pollutants.” Actual amounts of diesel soot emissions in these 12 counties declined during state fiscal years 2009 to 2012 from 3,700 to 2,880 tons per year. Ecology’s goals in recent years have been for annual emissions declining from 3,110 to 2,990 tons. As of late September 2012, Ecology has not published goals for timeframes beyond state fiscal year 2013. The values shown here have not been developed or agreed upon by Ecology.
- ¹¹ Assumes: Sources of contamination and harm in juvenile salmon is not understood, especially for fish sampled from areas away from central Puget Sound urban bays.
- ¹² The NTA also discusses sediment management standard rulemaking (by the end of 2013) as well as water quality rulemaking guided by September 2011 draft Fish Consumption Rates – Technical Support Document and other appropriate relevant information as it becomes available. No performance measure is established for this portion of C1.1 NTA3.
- ¹³ Assumes: (1) Cleanups will focus on bays identified as part of Ecology’s Puget Sound Initiative and Urban Waters Initiative; (2) Remediation action will be underway for projects that had been identified by 2012; any sites identified after 2012 will be investigated and remediated over a longer time frame.
- ¹⁴ Assumes: (1) Monitoring the effectiveness of source control programs, legacy pollutant removal, etc. are implemented as areas of focus of “testing the effectiveness of non-structural ... and programmatic approaches used in stormwater management programs; (2) Stormwater effectiveness monitoring also includes “testing the effectiveness of retrofitting urban areas with various flow management and water quality treatment approaches” These are elements of the Stormwater Work Group’s strategic framework for effectiveness monitoring.
- ¹⁵ Assumes: Improved sediment quality will be observed at sites that had been identified by 2012; any sites identified after 2012 will be investigated and remediated over a longer time frame.