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## Puget Sound Pressures - Source Classification

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Jan 7, 2014

These 41 Puget Sound Pressure Sources, grouped into 8 source categories, have been developed as part of the PSPA project. They represent a modest revision to the PSP 2012 Pressure Taxonomy and have been revised to better capture sources of stress in Puget Sound and for better alignment with the IUCN threat taxonomy.

Sources are the cause of stressors that, in turn, are the causes of stressed conditions in the ecosystem. Stressors are listed in a companion Puget Sound Stressors table.

<p><b><u>1. Residential &amp; Commercial Development</u></b> 1.1 Housing &amp; Urban Areas 1.2 Commercial &amp; Industrial Areas (Including Ports) 1.3 Tourism &amp; Recreation Areas</p> <p><b><u>2. Agriculture &amp; Aquaculture</u></b> 2.1 Annual &amp; Perennial Non-Timber Crops 2.2 Wood &amp; Pulp Plantations 2.3 Livestock Farming &amp; Ranching 2.4 Marine &amp; Freshwater Finfish Aquaculture 2.5 Marine shellfish aquaculture</p> <p><b><u>3. Energy Production &amp; Mining</u></b> 3.1 Oil &amp; Gas Drilling 3.2 Mining &amp; Quarrying 3.3 Renewable Energy</p> <p><b><u>4. Transportation &amp; Service Corridors</u></b> 4.1 Roads &amp; Railroads (Including Culverts) 4.2 Utility &amp; Service Lines</p>	<p><b><u>5. Biological Resource Use</u></b> 5.1 Hunting &amp; Collecting Terrestrial Animals 5.2 Gathering Terrestrial Plants 5.3 Logging &amp; Wood Harvesting 5.4 Fishing &amp; Harvesting Aquatic Resources</p> <p><b><u>6. Human Intrusions &amp; Disturbance</u></b> 6.1 Recreational Activities 6.2 War, Civil Unrest &amp; Military Exercises 6.3 Work &amp; Other Activities</p> <p><b><u>7. Natural System Modifications</u></b> 7.1 Fire &amp; Fire Suppression 7.2.1 Abstraction of surface water 7.2.2 Abstraction of ground water 7.2.3 Dams 7.2.4 Freshwater Levees, Floodgates, Tidegates 7.2.5 Marine Levees, Floodgates, Tidegates 7.3 Freshwater shoreline infrastructure</p>	<p><b><u>9. Pollution</u></b> 9.1.1.1 Domestic &amp; Municipal Wastewater to Sewer 9.1.1.2 Domestic and Commercial Wastewater to Onsite Sewage Systems (OSS) 9.1.2 Runoff from residential and commercial lands 9.2.1 Oil Spills 9.2.2 Seepage from mining 9.2.3 Industrial Wastewater 9.2.4 Industrial Runoff 9.3 Agricultural &amp; Forestry Effluents 9.4 Garbage &amp; Solid Waste 9.5 Air-Borne Pollutants 9.6 Release of Excess Energy (light, heat, sound)</p>
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4.3 Shipping Lanes and Dredged Waterways 4.4 Flight Paths	7.4 Marine shoreline infrastructure	
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Proposed source classes\* for Puget Sound Pressure Assessment Project (PSPA), Chinook M&AM Project (M&AM), and other PSP work are in blue

\* These are represented with pink boxes in Miradi diagrams

Source Classes	Definition and Exposition	Puget Sound Examples	Definition Notes	Relationship to PSP 2012
1 Residential & Commercial Development	<i>Human settlements or other non-agricultural land uses with a substantial footprint</i> These sources of stress are tied to a defined and relatively compact area, which distinguishes them from those in 4. Transportation & Service Corridors which have a long narrow footprint, and 6. Human Intrusions & Disturbance which do not have an explicit footprint.		Slightly revised IUCN	Same
1.1 Housing & Urban Areas	<i>Human cities, towns, and settlements including non-housing development typically integrated with housing</i> This class dovetails with 1.2 Commercial and Industrial Areas (including ports). As a general rule, however, if people live in the development, it should fall into this source class. This class does not include transportation and utility infrastructure, water use, shoreline armoring and overwater structures, or runoff and other pollution associated with any developed areas (see 4, 7, and 9).	urban areas, suburbs, villages, ranchettes, vacation homes, shopping areas, offices, schools, hospitals, land reclamation or expanding human habitation that causes habitat conversion or degradation in riverine, estuary and coastal areas, etc.	Merged IUCN and PSP 2012	1.1 Residential & Commercial Development  <i>(included new 1.2 and 1.3)</i>

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<p>1.2 Commercial &amp; Industrial Areas (Including Ports)</p>	<p><i>Factories and other commercial centers</i> Shipyards and airports fall into this class, whereas shipping lanes and flight paths fall under 4. Transportation &amp; Service Corridors. Overwater structures and shoreline armoring associated with marinas and ports fall under 7 Natural System Modifications. Water use and dams are also covered under 7 Natural System Modifications. For runoff and other pollution associated with commercial and industrial areas, see 9. Pollution.</p>	<p>military bases, factories, stand-alone shopping centers, office parks, power plants, train yards, ship yards, ports, airports, landfills, etc.</p>	<p>Slightly revised IUCN</p>	<p>1.1 Residential &amp; Commercial Development</p>
<p>1.3 Tourism &amp; Recreation Areas</p>	<p><i>Tourism and recreation sites with a substantial footprint</i> This class includes vacation housing/resorts and associated habitat effects of recreation areas. However, disturbance effects posed by recreational activities outside the footprint of developed areas are included in 6.1 Recreational Activities.</p>	<p>ski areas, golf courses, resorts, ball fields, county parks, campgrounds, coastal and estuarine tourist resorts, etc.</p>	<p>Slightly revised IUCN</p>	<p>1.1 Residential &amp; Commercial Development</p>
<p>2 Agriculture &amp; Aquaculture</p>	<p><i>Farming and ranching practices, expansion and intensification, including silviculture, mariculture and aquaculture (includes the impacts of any fencing around farmed areas)</i> The use of agrochemicals, rather than the direct conversion of land to agricultural use, should be included under 9.3 Agricultural &amp; Forestry Effluents. Likewise in cases where conversion to agriculture causes increased run-off and hence sedimentation of rivers and lakes, that is also best treated under 9.3 Agricultural &amp; Forestry Effluents.</p>		<p>Same as IUCN</p>	<p>same</p>

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<p>2.1 Annual &amp; Perennial Non-Timber Crops</p>	<p><i>Crops planted for food, fodder, fiber, fuel, or other uses</i> This class includes small-holder farming, agro-industry farming, and rotating agriculture.</p>		<p>Revised IUCN level 2 to include level 3</p>	<p>2.1 Agriculture (same, just different name)</p>
<p>2.2 Wood &amp; Pulp Plantations</p>	<p><i>Stands of trees planted for timber or fiber outside of natural forests, often with non-native species</i> If it is one or a couple timber species that are planted on a rotation cycle, it belongs here. If it is multiple species or enrichment plantings in a quasi-natural system, it belongs in 5.3 Logging &amp; Wood Harvesting. This class includes small-holder and agro-industry plantations</p>		<p>Revised IUCN level 2 to include level 3</p>	<p>2.5 Timber Harvesting (split out logging from original 2012 class and put it in 5.3 Logging)</p>
<p>2.3 Livestock Farming &amp; Ranching</p>	<p><i>Domestic terrestrial animals raised in one location on farmed or non-local resources (farming); also domestic or semi-domesticated animals allowed to roam in the wild and supported by natural habitats (ranching)</i> This class includes small-holder grazing, ranching or farming, and agro-industry grazing, ranching and farming, and nomadic grazing. In farming, animals are kept in captivity; in ranching they are allowed to roam in wild habitats. Forage of wild resources for stall-fed animals falls under 5.2 Gathering Terrestrial Plants. If a few animals are mixed in a subsistence cropping system, it belongs in 2.1 Annual &amp; Perennial Non-Timber Crops.</p>		<p>Revised IUCN level 2 to include level 3</p>	<p>2.2 Livestock Grazing (same, just different name and number)</p>

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<p>2.4 Marine &amp; Freshwater Finfish Aquaculture</p>	<p><i>Finfish raised in one location on farmed or non-local resources; also hatchery fish allowed to roam in the wild</i> This class includes pressures associated with the location, intensification, or practice of finfish aquaculture. Farmed animals are kept in captivity; hatchery fish are put into wild habitats and are the aquatic equivalent of terrestrial ranching.</p>		<p>Merged IUCN and PSP 2012 definition</p>	<p>2.3 Fin Fish Aquaculture <i>(same, just different name and number)</i></p>
<p>2.5 Marine shellfish aquaculture</p>	<p><i>Marine shellfish raised in one location on farmed or non-local resources</i> This class includes pressures associated with the location, intensification, or practice of shellfish aquaculture.</p>		<p>Merged IUCN and PSP 2012 definition</p>	<p>2.4 Shellfish Aquaculture <i>(same, just different name and number)</i></p>
<p>3 Energy Production &amp; Mining</p>	<p><i>Production of non-biological resources</i> Various forms of water use (for example, dams for hydro power) that involve alterations to hydrologic regimes should go in 7.2 Dams &amp; Water Management/Use.</p>		<p>Same as IUCN</p>	<p>Same</p>
<p>3.1 Oil &amp; Gas Drilling</p>	<p><i>Exploring for, developing, and producing petroleum and other liquid hydrocarbons</i> Oil and gas pipelines go into 4.2 Utility &amp; Service Lines. Spills (oil or other hazardous substances) associated with drilling or transportation of oil should be put in 9.2.</p>	<p>oil wells, deep sea natural gas drilling, hydraulic fracking, etc.</p>	<p>Revised IUCN definition to better fit Puget Sound context</p>	<p>3.1 Energy production &amp; energy emissions <i>(removed emissions, now 9.5, and excess energy, now 9.6)</i></p>

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<p>3.2 Mining &amp; Quarrying</p>	<p><i>Exploring for, developing, and producing minerals and rocks</i> Deforestation caused by strip mining should be included here if the motivation is access to minerals. It should be included in 5.3 Logging &amp; Wood Harvesting if the primary motivation is access to the trees. Sediment or toxic chemical runoff from mining is under 9.2 Industrial &amp; Military Effluents.</p>	<p>coal strip mines, alluvial gold panning, gold mines, rock quarries, sand/salt mines, coral mining, deep sea nodules, guano harvesting, dredging outside of shipping lanes, etc.</p>	<p>Slightly revised IUCN definition</p>	<p>3.2 Mineral &amp; Gravel Mining <i>(removed air and water pollution, now in 9)</i></p>
<p>3.3 Renewable Energy</p>	<p><i>Exploring, developing, and producing renewable energy</i> Hydropower should be put in 7.2 Dams &amp; Water Management/Use.</p>	<p>geothermal power production, solar farms, wind farms (including birds flying into windmills), tidal farms, etc.</p>	<p>Same as IUCN</p>	<p>New for 2014</p>
<p>4 Transportation &amp; Service Corridors</p>	<p><i>Long narrow transport corridors and the vehicles that use them</i> This includes transportation and utility corridors outside of human settlements and industrial developments in terrestrial and aquatic environments. These corridors are associated with specific stressors including especially fragmentation of habitats and direct species mortality.</p>		<p>Revised IUCN</p>	<p>same</p>
<p>4.1 Roads &amp; Railroads (Including Culverts)</p>	<p><i>Surface transport on roadways and dedicated tracks</i> Off-road vehicles are treated in the appropriate category in 6. Human Intrusions &amp; Disturbance. If there are small roads associated with a major utility line, they belong in 4.2 Utility &amp; Service Lines.</p>	<p>highways, secondary roads, primitive roads, logging roads, bridges &amp; causeways, fencing associated with roads, freight/passenger/mining railroads, etc.</p>	<p>Same as IUCN</p>	<p>4.1 Transportation &amp; Service Corridors <i>(created separate pressure classes for roads/railroads, utility and service lines, shipping lanes and dredged waterways and flight paths; added culverts to this class)</i></p>

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4.2 Utility & Service Lines	<p><i>Transport of energy &amp; resources</i> Cell phone and other communication towers connected by small access roads belong here. If there are small utility lines using a road right of way, they belong in 4.1 Roads &amp; Railroads. Oil spills from pipelines should go in 9.2 Industrial &amp; Military Effluents.</p>	electrical & phone wires, aqueducts, oil & gas pipelines, electrocution of wildlife, etc.	Same as IUCN	<i>New; used to be in 4.1 Transportation &amp; Service Corridors</i>
4.3 Shipping Lanes and Dredged Waterways	<p><i>Transport on and in freshwater and ocean waterways</i> This class includes vessel traffic as well as dredging and other activities that maintain shipping lanes. Wastewater discharge from tugs and non-military cargo vessels is also included here. Anchor damage from dive boats belongs in 6.1 Recreational Activities. Oil spills from ships should go in 9.2 Industrial &amp; Military Effluents.</p>	canals, shipping lanes, whale-watching routes, wakes from cargo ships, etc.	Slightly revised IUCN	<i>New &amp; revised; Shipping used to be in 4.1 Transportation &amp; Service Corridors; Dredging used to be in 4.2 Dredging &amp; Dredged Material</i>
4.4 Flight Paths	<p><i>Air and space transport</i> Airports fall into 1.2 Commercial &amp; Industrial Areas.</p>	flight paths, jets impacting birds, etc.	Same as IUCN	<i>new</i>
5 Biological Resource Use	<p><i>Consumptive use of "wild" biological resources; also persecution or control of specific species</i></p>		Slightly revised IUCN definition to better fit Puget Sound context	same

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<p>5.1 Hunting &amp; Collecting Terrestrial Animals</p>	<p><i>Killing or trapping terrestrial wild animals or animal products for commercial, recreation, subsistence, research or cultural purposes, or for control/persecution reasons</i>          This class focuses on animals that primarily live in a terrestrial environment, as well as those that live on the terrestrial/aquatic boundary. Hunting otters, beavers, amphibians, waterfowl, and sea birds should go here. Hunting seals, whales and other marine mammals, and freshwater and marine turtles go in 5.4 Fishing &amp; Harvesting Aquatic Resources. This also includes animal products that are traditionally "gathered", such as honey, eggs, or insects or other slow moving targets.</p>	<p>trophy hunting, beaver trapping, butterfly collecting, honey or bird nest hunting, etc.; pest control, hunting with dogs, wolf control, pest control, persecution of snakes because of superstition, etc.</p>	<p>Revised IUCN level 2 to include level 3</p>	<p>5.2 Animal Harvesting (Terrestrial)  <i>(new name and number)</i></p>
<p>5.2 Gathering Terrestrial Plants</p>	<p><i>Harvesting plants, fungi, and other non-timber/non-animal products for commercial, recreation, subsistence, research or cultural purposes, or for control reasons</i>          This class focuses on plants, mushrooms, and other non-animal terrestrial species except trees which are treated in 5.3 Logging &amp; Wood Harvesting. This source can have intentional and unintentional impacts on target and non-target species.</p>	<p>wild mushroom collection, forage for stall fed animals, orchid collection, harvesting of flowers and greens, etc.; control of host plants to combat timber diseases, etc.</p>	<p>Revised IUCN level 2 to include level 3</p>	<p><i>New for 2014</i></p>

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<p>5.3 Logging &amp; Wood Harvesting</p>	<p><i>Harvesting trees and other woody vegetation for timber, fiber, or fuel</i>          This includes subsistence scale use and large scale use, both of which can have intentional and unintentional effects on target and non-target species. Felling trees to clear agricultural land goes in the appropriate category in 2. Agriculture &amp; Aquaculture. If it is a few timber species that are planted on a rotation cycle, it belongs in 2.2 Wood &amp; Pulp Plantations. If it is multiple species or enrichment plantings in a quasi-natural system, it belongs here. Consider the specific product(s) harvested and the method used e.g., clear cutting of hardwoods, selective commercial logging, pulp or woodchip operations, fuel wood collection, etc.</p>		<p>Revised IUCN level 2 to include level 3 and better address Puget Sound context</p>	<p><i>New for 2014; brought in Timber Harvest from 2012 2.5 Timber Harvesting</i></p>
<p>5.4 Fishing &amp; Harvesting Aquatic Resources</p>	<p><i>Harvesting aquatic wild animals or plants for commercial, recreation, subsistence, research, or cultural purposes, or for control/persecution reasons; includes accidental mortality/bycatch</i>          This category focuses on all kinds of species that are primarily found in an aquatic environment as well as some species that live on the terrestrial/aquatic boundary. Hunting seals, whales and other marine mammals, and freshwater and marine turtles should go here. Hunting otters, beavers, amphibians, waterfowl, and sea birds should go in 5.1 Hunting &amp; Collecting Terrestrial Animals. This class includes large scale harvest and subsistence/small scale harvest and can be a source of multiple stressors, including harvest (intentional), and discards or bycatch (unintentional). Note that associated stresses can be both ecosystem degradation and species mortality.</p>	<p>commercial trawling, commercial long-line fisheries, whaling, seal hunting, turtle egg collection, live coral collection, seaweed collection, blast fishing, cyanide fishing, artisanal trawling, shark nets trapping non-target species, loss of a species' prey base due to over-harvesting by humans of their prey, etc.          beach protection with shark nets, sharks and seals killed because they eat commercial fish species, etc.</p>	<p>Revised IUCN level 2 to include level 3 and better address Puget Sound context</p>	<p>5.1 Animal Harvesting (Aquatic)  <i>(new name and number)</i></p>

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<p>6 Human Intrusions &amp; Disturbance</p>	<p><i>Human activities that alter, destroy and disturb habitats and species associated with non-consumptive uses of biological resources</i>          Non-consumptive use means that the resource is not removed i.e. multiple people can use the same resource (e.g., birdwatching). These pressures typically do not permanently destroy habitat except perhaps in extremely severe manifestations.</p>			<p>Same</p>
<p>6.1 Recreational Activities</p>	<p><i>People spending time in nature or traveling in vehicles outside of established transport corridors, usually for recreational reasons</i>          This class includes wastewater discharged from recreational vessels. It does not include work involving consumptive use of biodiversity. For example, disturbance impacts from loggers or hunters would be in the appropriate category in 5. Biological Resource Use. Vehicles in established transport corridors go in 4. Transportation &amp; Service Corridors. The development of activities at permanent recreational or tourist facilities (such as hotels and resorts) should be included under section 1.3 Tourism &amp; Recreation Areas rather than here.</p>	<p>off-road vehicles, motorboats, motorcycles, jet-skis, snowmobiles, ultralight planes, dive boats, whale watching, mountain bikes, hikers, cross-country skiers, hanggliders, birdwatchers, scuba divers, pets brought into recreation areas, temporary campsites, caving, rock-climbing, etc.</p>	<p>Slight modification from IUCN (boat traffic is here)</p>	<p>same</p>
<p>6.2 War, Civil Unrest &amp; Military Exercises</p>	<p><i>Actions by formal or paramilitary forces without a permanent footprint</i>          This class focuses on military activities that have a large impact on natural habitats, but are not permanently restricted to a single area. It also includes wastewater discharged from military vessels. Development and operation of permanent military bases should go under 1.2 Commercial &amp; Industrial Areas.</p>	<p>armed conflict, mine fields, tanks &amp; other military vehicles, training exercises &amp; ranges, defoliation, munitions testing, etc.</p>	<p>Same as IUCN</p>	<p>6.2 Military Exercises  <i>(new name and number)</i></p>

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6.3 Work & Other Activities	<i>People spending time in or traveling in natural environments for reasons other than recreation or military activities</i>	law enforcement, drug smugglers, illegal immigrants, species research, vandalism, etc.	Same as IUCN	<i>New for 2014</i>
				<i>Note that the old 6.3 Dredging has been deleted in 2014 and is now covered in 4.3 Shipping Lanes and Dredged Waterways</i>
7 Natural System Modifications	<p><i>Actions and structures that convert or degrade habitat in service of “managing” natural or semi-natural systems</i></p> <p>This class deals primarily with changes to natural processes such as fire, hydrology, and sedimentation, rather than land use. Thus it does not include pressures relating to agriculture (which should be under 2. Agriculture &amp; Aquaculture), or infrastructure (1. Residential &amp; Commercial Development and 4. Transportation &amp; Service Corridors).</p>			same
7.1 Fire & Fire Suppression	<p><i>Suppression or increase in fire frequency and/or intensity outside of its natural range of variation</i></p> <p>This class focuses on the human activities that lead to either not enough fire or too much fire in the ecosystem in question. If fire escapes from established agricultural lands, it belongs here, if fire is used to clear new agricultural lands, it belongs in the appropriate category in 2. Agriculture &amp; Aquaculture. It also includes damaging "natural" fires in systems that have lost their natural resilience.</p>	inappropriate fire management, escaped agricultural fires, arson, campfires, fires for hunting, fire suppression to protect homes, etc.	Same as IUCN	<i>New for 2014</i>

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<p>7.2 Dams &amp; Water Management/ Use</p>	<p><i>Changing water flow patterns from their natural range of variation either deliberately or as a result of other activities</i>          This class focuses on the human activities that lead to either not enough water or too much water in the ecosystem in question. Note that homogenizing flows to a constant level may be outside the "natural range of variation." This includes surface water diversion, channelization, ditching, artificial lakes, groundwater pumping, dam construction, release of too little or cold water from dam operations, sediment control, dikes, levees, floodgates and tidegates, etc. Dredging belongs in 4.3 Shipping Lanes.</p>		<p>Revised IUCN</p>	<p><i>New level for 2014</i></p>
<p>7.2.1 Abstraction of surface water</p>	<p><i>Diverting or withdrawing surface water</i></p>		<p>New definition for PSPA</p>	<p><i>New for 2014; used to be in 10.1 Water Withdrawals*          *Note that the 10.1 class has been deleted for 2014 and topics are now covered elsewhere</i></p>
<p>7.2.2 Abstraction of ground water</p>	<p><i>Pumping or other extraction of ground water</i></p>		<p>New definition for PSPA</p>	<p><i>New for 2014; used to be in 10.1 Water Withdrawals*          *Note that the 10.1 class has been deleted for 2014 and topics are now covered elsewhere</i></p>

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7.2.3 Dams	<i>Construction or operation of dams used to generate hydropower or manage how and when water flows through a system</i> Impacts associated with dams include conversion/loss or degradation of habitat, altered hydrology, and altered connectivity		Slightly revised PSP 2012 definition	7.1 Dams <i>(new number)</i>
7.2.4 Freshwater Levees, Floodgates, Tidegates	<i>Levees &amp; floodgates along freshwater systems to manage the hydrologic flow in a system</i> Impacts associated with levees and floodgates include conversion/loss or degradation of habitat, altered hydrology, and altered connectivity		Slightly revised PSP 2012 definition	Same; new number
7.2.5 Marine Levees, Floodgates, Tidegates	<i>Levees &amp; tidegates along marine water systems to manage or exclude marine water into the freshwater system</i> Impacts associated with levees and tidegates include conversion or degradation of habitat, altered hydrology, and altered connectivity		Slightly revised PSP 2012 definition	Same; new number
7.3 Freshwater shoreline infrastructure	<i>Armoring of freshwater shorelines and overwater structures that alter, destroy, and disturb habitats and species via a nonconsumptive use, including industrial, commercial, and recreational marinas, ports and shipyards. Runoff from impervious surfaces or other water pollution should go in 9.1.</i>		Revised PSP 2012 to remove air pollution	Same; new number
7.4 Marine shoreline infrastructure	<i>Armoring of marine shorelines and overwater structures that alter, destroy, and disturb habitats and species via a nonconsumptive use, including industrial, commercial, and recreational marinas, ports and shipyards. Runoff from impervious surfaces or other water pollution should go in 9.1.</i>		Revised PSP 2012 to remove air pollution	Same; new number

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				7.2 Culverts <i>(deleted for 2014; moved to 4.1 Transportation &amp; Service Corridors)</i>
				8. Invasive & Other Problematic Species <i>(deleted for 2014 and handled as Stressors, not sources)</i>
9 Pollution	<i>Introduction of exotic and/or excess materials or energy from point and nonpoint sources</i>			
9.1 Domestic & Urban Waste Water				<i>New level for 2014</i>
9.1.1 Domestic & Commercial Sewage				New level for 2014

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<p>9.1.1.1 Domestic &amp; Municipal Wastewater to Sewer</p>	<p><i>Discharges from municipal WWTPs into hydrologic systems</i> This class includes water-borne sewage that includes nutrients, pathogens, toxic chemicals, and sediments. Discharges from combined sewer overflows CSOs are included here. Onsite sewage systems (OSS) go in 9.1.1.2. This class does not include wastewater discharged from recreational and other vessels (see 4.3, 6.1 and 6.2), or biosolids applied in terrestrial environments (see 9.3).</p>		<p>Revised PSP 2012 definition</p>	<p>9.2 Industrial, Domestic &amp; Municipal Wastewater (<i>revised 2012 class to remove industrial, now in 9.2</i>)</p>
<p>9.1.1.2 Domestic and Commercial Wastewater to Onsite Sewage Systems (OSS)</p>	<p><i>Discharges from Onsite Sewage Systems (OSS)</i> This class includes sewage and leachates (nutrients, toxic chemicals and/or sediment) from residences and commercial facilities not connected to a municipal system (septics, small private systems, and everything with a drain field).</p>		<p>Slightly revised PSP 2012 definition</p>	<p>9.3 Onsite Sewage Systems (OSS) (<i>new name and number</i>)</p>
<p>9.1.2 Runoff from residential and commercial lands</p>	<p><i>Introduction of exotic or excess material into hydrologic system due to surface water loading and runoff from the built environment</i> This class includes runoff from commercial and residential lands, transportation facilities and corridors, as well as hull-cleaning and other pollution from marina infrastructure and land-based boat maintenance practices (i.e. NPDES regulated activities that occur in marinas and shipyards). Loading from septic systems (OSS) goes in 9.1.1.2, combined sewer overflows (CSOs) goes in 9.1.1.1, runoff from other activities (e.g. agriculture, timber harvest) goes in 9.3, and industrial runoff goes in 9.2.4.</p>		<p>Revised PSP 2012 definition</p>	<p>9.1 Runoff from built environment (<i>new name and number</i>)</p>

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<p>9.2 Industrial &amp; Military Effluents</p>	<p><i>Water-borne pollutants from industrial and military sources including mining, energy production, and other resource extraction industries that include nutrients, toxic chemicals and/or sediments</i></p> <p>The source of the pollution is often far from the system – an extreme example are the heavy metals that migrating eels bring to the Sargasso Sea. Often, the pollutants only become a problem when they bioconcentrate through the food chain.</p>		<p>Used IUCN definition</p>	
<p>9.2.1 Oil Spills</p>	<p><i>Accidental, episodic, or potentially catastrophic spill of oil and hazardous waste in aquatic and terrestrial environments</i></p> <p>This class includes oil spills from pipelines, vessels, marine terminals, and industrial facilities. It does not include chronic or other frequent, smaller pollution events related to normal operations of vehicles, vessels, etc (see 9.1.2)</p>		<p>Used PSP 2012 definition</p>	<p>9.6 Oil &amp; Hazardous Spills <i>(new name and number)</i></p>
<p>9.2.2 Seepage from mining</p>	<p><i>Water-borne pollutants from mining, including nutrients, toxic chemicals and/or sediments</i></p>		<p>Extracted relevant info from IUCN 9.2 definition</p>	<p><i>New for 2014</i></p>

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<p>9.2.3 Industrial Wastewater</p>	<p><i>Discharge from industrial WWTPs into hydrologic systems</i>  This class includes water-borne sewage that includes nutrients, pathogens, toxic chemicals, and sediments. Loading from municipal and domestic WWTP goes in 9.1.1.1, septic systems (OSS) goes in 9.1.1.2, combined sewer overflows (CSOs) goes in 9.1.1.1, runoff from other activities (e.g. agriculture, timber harvest) goes in 9.3, and industrial runoff goes in 9.2.4.</p>		<p>Revised PSP 2012 definition</p>	<p><i>New for 2014</i></p>
<p>9.2.4 Industrial Runoff</p>	<p><i>Introduction of exotic or excess material into hydrologic system due to surface water loading and runoff from industrial lands</i>  This class includes runoff from industrial facilities and lands. Runoff from other lands (residential and commercial) goes in 9.1.2. Loading from septic systems (OSS) goes in 9.1.1.2, combined sewer overflows (CSOs) goes in 9.1.1.1, runoff from other activities (e.g. agriculture, timber harvest) goes in 9.3, and industrial runoff goes in 9.2.4.</p>		<p>revised PSP 2012 definition</p>	<p><i>New for 2014</i></p>
<p>9.3 Agricultural &amp; Forestry Effluents</p>	<p><i>Water-borne pollutants from agricultural, silvicultural, and aquaculture systems that include nutrients, toxic chemicals and/or sediments including the effects of these pollutants on the site where they are applied</i>  This class also includes pollutants added by biosolids, herbicide, and pesticide application. Wind erosion of agricultural sediments or smoke from forest fires goes in 9.5 Air-Borne Pollutants.</p>	<p>nutrient loading from fertilizer run-off, manure from feedlots, nutrients from aquaculture, etc.; soil erosion from overgrazing, increased run-off and hence sedimentation due to conversion of forests to agricultural lands, etc.; herbicide run-off from orchards, etc.</p>	<p>Slight modification of IUCN</p>	<p><i>New for 2014 (used to be covered under 2.1 Agriculture and 2.5 Timber Harvest)</i></p>

# D R A F T

<p>9.4 Garbage &amp; Solid Waste</p>	<p><i>Rubbish and other solid materials including those that entangle wildlife</i> This class generally is for solid waste outside of designated landfills - landfills themselves should go in 1.2 Commercial &amp; Industrial Areas. Likewise, toxins leaching from solid waste - for example, mercury leaking out of a landfill into groundwater - should go in 9.2 Industrial &amp; Military Effluents.</p>	<p>municipal waste, litter from cars, flotsam &amp; jetsam from recreational boats, waste that entangles wildlife, construction debris, etc.</p>	<p>Same as IUCN</p>	<p><i>New for 2014</i></p>
<p>9.5 Air-Borne Pollutants</p>	<p><i>Atmospheric pollutants from stationary and mobile sources</i> This class includes smog and ozone, the specific sources of which can be difficult to determine and difficult to address.</p>	<p>smog from vehicle emissions, factory smoke emissions, coal burning, wind dispersion of pollutants or sediments, smoke from forest fires or wood stoves, etc. Associated stressors can include acid rain, excess nitrogen deposition, radioactive fallout</p>	<p>Slight modification of IUCN definition and collapsed level 3 definitions</p>	<p><i>New for 2014 (used to be partially covered in 3.1 Energy production &amp; energy emissions)</i></p>
<p>9.6 Release of Excess Energy (light, heat, sound)</p>	<p><i>Inputs of heat, sound, or light that disturb wildlife or ecosystems</i> These inputs of energy can have strong effects on some species or ecosystems.</p>	<p>lamps attracting insects, beach lights disorienting turtles, etc.; heated water from power plants, damaging atmospheric radiation resulting from ozone holes, etc.; noise from highways or airplanes, sonar from submarines that disturbs whales, etc.</p>	<p>Used IUCN definition and collapsed level3 definitions</p>	<p><i>New for 2014 (used to be partially covered in 3.1 Energy production &amp; energy emissions)</i></p>
				<p>9.5 Toxics &amp; Legacy Contaminants <i>(deleted for 2014)</i></p>