

# Glossary

*Cross-references are given in italic type.*

**abundance:** the number of fish; the size of the stock.<sup>1</sup>

**Aboriginal fishery guardian:** fishery guardians employed by First Nations who engage in enforcement activities in accordance with Aboriginal fishing agreements.<sup>2</sup>

**acute:** in reference to infections, marked by a sudden onset of detectable symptoms that are usually followed by complete or apparent recovery.<sup>3</sup>

**adult:** *mature* (includes life stages 4 and 5). See *life cycle*.

**aerobic scope:** level of oxygen available for activities between basal (resting) and maximal metabolic rates; a characteristic describing the fish's ability to allocate energy to essential tissues.<sup>4</sup>

**age class:** *ecotype* designation based on the number of winters in freshwater after hatching and the number of winters in saltwater.<sup>5</sup>

**alevin:** sockeye *life stage* that occurs just after hatching from the egg, with *yolk sac* still present; alevins live in gravel until they emerge as *fry*.<sup>6</sup>

**amphipod:** group of small, mostly planktonic crustaceans belonging to the order Amphipoda.<sup>7</sup>

**anadromous:** fish that spend most of the growing phase of their *life cycle* in the sea, but return to freshwater to breed.<sup>8</sup>

**anthropogenic:** caused by humans.

**aquaculture:** farming of aquatic organisms in the marine environment or freshwater;<sup>9</sup> unless otherwise stated, in this Report the term “aquaculture” refers specifically to marine salmon aquaculture, or “salmon farms.”

**Atlantic salmon:** species of salmon originating from the northern Atlantic Ocean; commonly used in *aquaculture*.<sup>10</sup>

**back eddies:** places where water flows past an obstacle, which can create a reverse current or cause the water to move in an otherwise different direction or at a different speed.<sup>11</sup>

**benthic areas:** areas of the seafloor.<sup>12</sup>

**bioassay:** controlled experiment for the quantitative estimation of a substance by measuring its effect in a living organism.<sup>13</sup>

**biodiversity:** full range of variety and variability within and among living organisms and the ecological complexes in which they occur; encompasses diversity at the *ecosystem*, community, species, and genetic levels as well as in the interaction of these components.<sup>14</sup>

**biota:** all the organisms living in a particular region, including plants, animals, and micro-organisms.<sup>15</sup>

**bloodwater:** wastewater from facilities where fish are processed.<sup>16</sup>

**brailing:** using a long-handled “net” scoop to take fish out of the *seine* net.

**brood year:** year when salmon eggs are laid.<sup>17</sup>

**brood-year returns:** See *total returns*.

**bycatch:** refers to non-target species (e.g., sockeye salmon when fishing for pink salmon) that become entangled or caught in fishing gear.<sup>18</sup>

**caligid copepod:** parasitic *copepod* crustacean of the family Caligidae.<sup>19</sup>

**caudal:** pertaining to the tail or tail region.<sup>20</sup>

**chlorophyll bloom:** areas in the ocean with high, sustained chlorophyll- $\alpha$  values in the surface waters.<sup>21</sup>

**chronic:** *disease* that may persist for many months or years and may not directly kill the host.<sup>22</sup>

**ciliate:** single-celled organism that uses a number of short cell appendages for locomotion.<sup>23</sup>

**closed containment facility:** facilities that use a range of technologies which attempt to restrict and control interactions between farmed fish and the external aquatic environment, with the goal of minimizing impact and creating greater control over factors in *aquaculture* production.<sup>24</sup>

**compass orientation:** ability to move in a fixed direction without reference to local landmarks.<sup>25</sup>

**conservation:** protection, maintenance, and rehabilitation of genetic diversity, species, and *ecosystems* to sustain *biodiversity* and the continuance of evolutionary and natural production processes.<sup>26</sup>

**conservation (of habitats):** planned management of human activities that might affect fish habitats in order to prevent destruction and the subsequent loss of fisheries.<sup>27</sup>

**Conservation Unit:** group of *wild salmon* sufficiently isolated from other groups that, if *extirpated*, is very unlikely to recolonize naturally within an acceptable time frame.<sup>28</sup>

**continental shelf:** gently sloping offshore zone that usually extends to approximately 200 m in depth.<sup>29</sup>

**copepods:** small marine and freshwater crustaceans of the subclass Copepoda; sea lice are parasitic members of this group.<sup>30</sup>

**counting fences:** high-precision method for fish enumeration used at spawning channels and at some rivers and lakes; fish are counted as they pass the fence.<sup>31</sup>

**cyclic dominance:** pattern of persistent large *abundance* every four years, followed by a slightly smaller subdominant year, with two extremely low abundances in off-cycle years.<sup>32</sup>

**degree days:** measurement of thermal exposure; accumulated degree days are calculated by multiplying the number of days that a fish is exposed to water of a certain temperature.<sup>33</sup>

**density dependence:** feedback mechanism whereby a large *escapement* is thought to create a negative effect on productivity such that subsequent *total returns* of adults could be reduced<sup>34</sup> (simple density dependence and delayed density dependence are described in Volume 2 of this Report).

**diatoms:** single-cellular algae in the phylum Bacillariophyta that are capable of forming filamentous colonies.<sup>35</sup>

**DIDSON:** Dual-frequency IDentification SONar, which provides high-definition sonar images.<sup>36</sup>

**dip net:** fishing technique used in the Fraser River canyon to catch large numbers of chinook and sockeye salmon; while standing above the current in the river narrows, the fisher dips a large net attached to the end of a pole into the water, traps fish inside, and hauls them out.<sup>37</sup>

**disease:** a host fish is diseased if it is behaviourally or physiologically compromised.<sup>38</sup>

**diversion rate:** percentage of returning sockeye approaching the Fraser River via the north coast of Vancouver Island and Johnstone Strait (also called the northern diversion rate).<sup>39</sup>

**dual fishing:** fishing for two purposes at the same time; for example, fishing commercially and also retaining fish for *food, social, and ceremonial* purposes.<sup>40</sup>

**Early Stuart run:** one of the four *run-timing groups* of Fraser River sockeye; this stock group spawns in the Takla-Trembleur Lake system and arrives in the Lower Fraser River from late June to late July.<sup>41</sup>

**Early summer run:** one of the four *run-timing groups* of Fraser River sockeye; this stock group spawns throughout the Fraser system and arrives in the Lower Fraser River from mid-July to mid-August; this run includes Bowron, Fennell, Gates, Nadina, Pitt, Raft, Scotch, Seymour, and Early Summer Miscellaneous (Early Shuswap, South Thompson, North Thompson tributaries, North Thompson River, Nahatlach River and Lake, Chilliwack Lake, and Dolly Varden Creek).<sup>42</sup>

**economic opportunity fishery:** separates commercial fishing allocations from allocations for *food, social, and ceremonial* purposes for First Nations.<sup>43</sup>

**ecosystem:** community of organisms and their physical environment interacting as an ecological unit.<sup>44</sup>

**ecosystem approach:** approach to the management of human activity that considers all the components of an *ecosystem* that may be affected by the activity, including populations, communities, and habitat, and their linkages, as well as the impact of the ecosystem on the state of the living resource.<sup>45</sup>

**ecotype:** distinguishes individuals that spend varying numbers of years in freshwater and in saltwater.<sup>46</sup>

**effective female spawner:** estimate of female spawner *abundance*, which is further adjusted downward by the

proportion of eggs that were not spawned, as determined by sampling on the spawning grounds.<sup>47</sup>

**El Niño Southern Oscillation:** inter-annual climate variability event that occurs every two to seven years and persists up to 1.5 years, characterized by coupled variations in sea surface temperature and sea level pressure in the tropical Pacific Ocean.<sup>48</sup>

**emergence:** developmental stage where *juvenile* salmon emerge from their gravel nest.<sup>49</sup>

**en route loss (en route mortality):** estimate of the number of upstream-migrating adults that die in the river en route to their spawning grounds.<sup>50</sup>

**endemic:** referring to a pathogen or disease that is constantly present in low numbers in a *population*.<sup>51</sup>

**enhancement:** application of biological and technical knowledge and capabilities to increase the productivity of fish stocks; this increase may be achieved by altering habitat attributes (e.g., habitat restoration) or by using fish culture techniques (e.g., hatcheries, spawning channels).<sup>52</sup>

**enterococci:** genus of lactic acid bacteria commonly found in the gastrointestinal tract of fish.

**epilimnion:** warm upper layer of water in a lake.<sup>53</sup>

**escapement:** number of *mature* salmon that pass through (or escape) fisheries and return to freshwater to spawn.<sup>54</sup>

**estuarine:** of or related to the border zone between freshwater and marine environments.<sup>55</sup>

**exploitation rate:** portion of all *adult* fish returning to their natal streams which are captured in a fishery.<sup>56</sup>

**extirpation:** local extinction of a species.<sup>57</sup>

**fallow:** in relation to *aquaculture*, the period of a few weeks between harvesting cycles when fish are absent from a site after harvesting and before the next restocking; also, the practice of site rotation where a site may be left empty for one or more years to allow the sediments to recover.<sup>58</sup>

**finfish:** freshwater and marine fish species that include salmon and non-salmonid species such as trout and sablefish;<sup>59</sup> also called “true fish,” having a backbone, gills, and limbs in the shape of fins.

**fish habitat:** spawning grounds and nursery, rearing, food supply, and migration areas on which fish depend directly or indirectly to carry out their life processes.<sup>60</sup>

**fish ladder:** structure designed to permit fish passage – for example, by providing access to spawning grounds upstream of a dam.<sup>61</sup>

**fisheries resources:** fish stocks or *populations* that sustain commercial, recreational, or Aboriginal fishing activities of benefit to Canadians.<sup>62</sup>

**flagellate:** single-celled organism that uses a long cellular appendage for locomotion.<sup>63</sup>

**flood plain:** flat or nearly flat land adjacent to a stream or river which experiences flood during periods of high water discharge.

**food, social, and ceremonial:** a fishing allocation for First Nations to fish for consumption for subsistence, social, and ceremonial purposes according to their distinctive culture.<sup>64</sup>

**Fraser River Panel:** panel created under the Pacific Salmon Treaty which manages the commercial harvest of Fraser River sockeye and pink salmon in *Fraser Panel Area Waters*.<sup>65</sup>

**fry:** life stage at which sockeye have emerged from gravel into freshwater streams, completed yolk absorption, and are less than a few months old.<sup>66</sup> See *life cycle*.

**furunculosis:** bacterial disease arising from an infection by the bacterium *Aeromonas salmonicida*.<sup>67</sup>

**gear:** various equipment used for fishing.

**genomic signature:** characteristic pattern of gene expression, revealed on a micro-array.<sup>68</sup>

**gillnet:** rectangular net that hangs in the water and is set from the stern or bow of a fishing vessel; when fish swim headfirst into the net, their gills get entangled in the mesh.<sup>69</sup>

**gonadal:** referring to the gonads (the organs in an animal that produce eggs and sperm).

**Heterosigma blooms:** blooms of the fish-killing algae *Heterosigma akashiwo*.

**histological analysis:** analysis of the microscopic anatomy of cells and tissues.

**histopathology:** microscopic examination of cells and tissues to study the manifestations of a *disease*; used in diagnosis.

**homeostasis:** tendency of an organism to maintain a steady state or equilibrium with respect to specific functions and processes.<sup>70</sup>

**horizontal transmission:** direct transfer of an infection from fish to fish.<sup>71</sup>

**hydroacoustics:** technology involving vessel and shore-based acoustic transducers to detect fish that are swimming.<sup>72</sup>

**hydrograph changes:** changes in the rate of water discharge or flow.

**immature:** sockeye that are older than *postsmolt* but will not *mature* in the current calendar year<sup>73</sup> (includes life stages 2 and 3).

**immunocompetence:** ability of the body to produce a normal immune response.

**immunogenetics:** study of the relationship between the immune system and genetics.

**immunosuppression:** reduction in the ability of the immune system to deal with infection, increasing the susceptibility of the host to other pathogens.<sup>74</sup>

**indicator stocks:** set of 19 Fraser River sockeye stocks for which a time series of *abundance* estimates has been maintained since 1952.<sup>75</sup>

**infectious hematopoietic necrosis (IHN):** severe, acute, systemic viral *disease* found in *fry* and *juvenile salmonids*.<sup>76</sup>

**in-season management:** management of the fishery as fish return to spawn; includes *run size* assessments, managing for *escapement* targets, and setting fishery opening and closing dates.<sup>77</sup>

**inter-annual variability:** differences that occur from year to year.

**inter-decadal variability:** differences that are recorded over decades; for example, inter-decadal climate variability in the North Pacific Ocean can be observed as atmospheric and oceanic trends that last for 20–30 years (e.g., *Pacific Decadal Oscillation*).<sup>78</sup>

**intergenerational effects:** cumulative effects that occur among generations of fish; for example, female sockeye experiencing warm water during egg development may produce offspring with lower fitness.<sup>79</sup>

**jacks:** male *anadromous* sockeye salmon that mature after one year at sea.<sup>80</sup>

**jills:** female *anadromous* sockeye salmon that mature after one year at sea.<sup>81</sup>

**juveniles:** the two sockeye salmon *life stages* at which *abundance* is estimated annually in freshwater – *fry* and *smolts*.<sup>82</sup>

**kokanee:** *populations* of sockeye salmon that are non-*anadromous* and remain as freshwater residents throughout their *life cycle*.<sup>83</sup>

**La Niña:** inter-annual climate variability event characterized by anomalous cool sea surface temperature and low sea level pressure; typically La Niña events lead to cool sea surface temperature in the waters off the west coast of North America.<sup>85</sup>

**landed value:** price paid to the commercial fisher or salmon farmer for the whole fish before processing; in aquaculture, an alternative term is “farmgate value.”<sup>84</sup>

**Late run:** one of the four *run-timing groups* of Fraser River sockeye; the Late run arrives in the Lower Fraser from late August to mid-October and spawns in the Lower Fraser, Harrison-Lillooet, Thompson, and Seton-Anderson systems; this run-timing group includes Cultus, Harrison, Late Shuswap, Portage, Weaver, Birkenhead, Miscellaneous Shuswap, and Late Miscellaneous non-Shuswap sockeye.<sup>86</sup>

**leachate:** liquid that, in passing through matter, extracts solutes, suspended solids, or any other component of the material through which it has passed.

**life cycle:** salmon have discrete life phases: life stage 1 – eggs and incubation, *alevin, fry*; life stage 2 – *smolt* (downstream migration); life stage 3 – *sub-adult*, transition to marine environment; life stage 4 – *adult* (marine growth); and life stage 5 – adult (return migration, spawning, and death).<sup>87</sup>

**life stage:** See *life cycle*.

**limited entry fishery:** fishery where no new licences are created, and the only way to acquire a licence is to purchase one from a current licence holder.<sup>88</sup>

**Lower Fraser Area:** for the purpose of fisheries management, the Lower Fraser Area includes the mouth of the Fraser River up to Sawmill Creek.<sup>89</sup>

**mainstem:** primary downstream segment of a river, as distinguished from its tributaries.

**mariculture:** cultivation, management, and harvesting of marine organisms in their natural habitat or in specially constructed rearing units; the end product is cultivated in seawater.<sup>90</sup>

**marine productivity:** *productivity* in the marine environment.

**mark-recapture:** high-precision method for enumeration of *escapement*; a method commonly used in ecology to estimate the size of an animal *population*.<sup>91</sup>

**mature:** *adult* (includes *life stages* 4 and 5).

**maximum sustainable yield (MSY):** largest catch (yield) that can be taken on average from a *population* under existing environmental conditions without depleting the population; catch will vary annually because of variation in the survival rate of the population.<sup>92</sup>

**meta-analysis:** statistical procedure for combining the results of several studies testing the same hypothesis.<sup>93</sup>

**metabolites:** various compounds that take part in or are formed by metabolic reactions.<sup>94</sup>

**metabolism:** sum of the chemical reactions that occur within a living organism.<sup>95</sup>

**micro-array:** arrayed series of thousands of microscopic spots, each containing tiny amounts of a specific DNA sequence used as a probe to screen large numbers of samples.<sup>96</sup>

**mixed-stock fishery:** fishery in which multiple stocks may be passing through an area in which the fishery is operating; the Fraser River sockeye fishery is generally considered a mixed-stock fishery.<sup>97</sup>

**morphology:** study of the structure and form of organisms.<sup>98</sup>

**mortality:** death of fish, or the number of fish killed through harvest or through the act of releasing species that cannot be retained in a fishery.<sup>99</sup>

**moult:** act of casting off the outer layers of an animal's covering (e.g., hair, scales, feathers).

**myxobacteriosis:** infection caused by bacteria of the order Myxococcales.

**myxozoa:** diverse group of microscopic parasites of aquatic origin.

**negative phase of the PDO:** phase of *Pacific Decadal Oscillation* (a type of *inter-decadal* climate variability) characterized by warm and cool sea surface temperatures over the western and eastern North Pacific Ocean, respectively.<sup>100</sup>

**nest:** depression dug in the gravel substrate by a spawning female sockeye salmon in which her eggs are deposited.<sup>101</sup>

**net-pen facility:** *aquaculture* facility that uses a net to contain fish, allowing water to pass through (as distinguished from a *closed containment facility*).

**nitrate:** ion consisting of one atom of nitrogen and three atoms of oxygen.<sup>102</sup>

**No Net Loss:** principle by which the Department of Fisheries and Oceans strives to balance unavoidable habitat losses with habitat replacement on a project-by-project basis so that further reductions to Canada's fisheries resources due to habitat loss or damage may be prevented.<sup>104</sup>

**non-point source:** discharges from a diffuse source; non-point sources include runoff from forest management areas, agricultural operations, municipal stormwater, or linear developments.<sup>103</sup>

**northern diversion route:** return migration route through Johnstone Strait and the Strait of Georgia to the Fraser River.<sup>105</sup>

**nursery lake:** See *rearing lake*.

**ocean-entry year:** the year in which a class of sockeye enters the ocean.

**orthomyxovirus:** RNA virus from the family Orthomyxoviridae.

**osmoregulation:** regulation of the levels of water and mineral salts in the blood to maintain *homeostasis*.

**outlier:** measurement or experimental result outside the expected range.

**over-escapement:** spawning *population* size that is larger than the optimal *escapement* goal;<sup>106</sup> also referred to as under-fishing.

**overflights:** aerial surveillance of fishing areas used as a technique to monitor fishing activity.<sup>107</sup>

**Pacific Decadal Oscillation:** atmospheric and oceanic index used to describe the *inter-decadal* variability in the climate of the North Pacific Ocean.<sup>108</sup>

**Pacific salmon:** salmon of the Pacific Ocean regions, of which 11 species are currently recognized in the genus *Oncorhynchus*.<sup>109</sup>

**Pacific Salmon Commission:** commission formed under the *Pacific Salmon Treaty* which is directly involved in managing Fraser River sockeye.<sup>110</sup>

**Pacific Salmon Treaty:** bilateral agreement between Canada and the United States addressing the allocation and *conservation* of Pacific salmon.<sup>111</sup>

**Panel Area Waters:** geographical area designated under the *Pacific Salmon Treaty* in which Fraser River sockeye and pink salmon management is subject to provisions of that treaty.<sup>112</sup>

**parvovirus:** one of a group of viruses with small, single-stranded DNA genomes.<sup>113</sup>

**pathogen:** agent (such as a virus, bacteria, or sea louse) that causes *disease*.<sup>114</sup>

**pathogenicity:** ability to cause *disease*.<sup>115</sup>

**pelagic:** of or relating to the open ocean, as opposed to the ocean bottom.<sup>116</sup>

**phenological:** an organism's biological response to climatic conditions.

**phenols:** class of organic compound with a hydroxyl functional group.

**phytoplankton:** small planktonic organisms, mostly single-celled algae, that manufacture their own food by turning sunlight into chemical energy; this process is called autotrophy.<sup>117</sup>

**pilot sales fishery:** Aboriginal communal economic fishery licensed under the *Aboriginal Communal Fishing Licenses Regulations*.<sup>118</sup>

**placer mining:** exploitation of placer mineral deposits (formed by gravity separation during sedimentation processes) for their valuable heavy metals.<sup>119</sup>

**plasmacytoid:** innate immune cells that circulate in the blood ready to respond to pathogens, but not specific to any particular type.<sup>120</sup>

**population:** group of interbreeding organisms that is relatively isolated (i.e., demographically uncoupled) from other such groups and is likely adapted to the local habitat.<sup>121</sup>

**positive phase of the PDO:** phase of *Pacific Decadal Oscillation* (a type of *inter-decadal* climate variability) characterized by cool and warm sea surface temperatures over the western and eastern North Pacific Ocean, respectively.<sup>122</sup>

**postsmolt:** *juvenile* salmon that has undergone the physiological changes necessary to live at sea, emigrated from freshwater, and in its first calendar year at sea.<sup>123</sup>

**pre-spawn mortality:** females that have arrived on spawning grounds but die with most of their eggs retained in their body.<sup>124</sup>

**prevalence:** percentage of individuals of a host species infected with a particular parasite species.<sup>125</sup>

**productive capacity:** maximum natural capability of habitats to produce healthy fish, safe for human consumption, or to support or produce aquatic organisms on which fish depend.<sup>126</sup>

**productivity:** numbers of returns per *spawner* by *brood year*.<sup>127</sup>

**protozoan:** There is no exact definition, but the term often refers to unicellular heterotrophic, usually microscopic, eukaryotic organisms such as amoebas and ciliates.

**purse-seine fishery:** type of fishery involving the use of *seine* nets that are gathered at the bottom to form a “purse.”

**rearing lake:** freshwater lake used by sockeye *fry* to feed and grow before developing into the *smolt* stage.

**recreational fishing (sport fishing):** non-commercial fishing to provide food for personal use or as a leisure activity.<sup>128</sup>

**recruitment:** See *recruits*.

**recruits:** also referred to as “returns”; the *abundance* of adults of a given sockeye *population*, usually estimated by summing the estimated number of *spawners* with abundances of fish that were caught in various fisheries.<sup>129</sup>

**redd:** sequential series of *nests* dug by a single female *salmonid*.<sup>130</sup>

**refugia:** places of refuge for salmon;<sup>131</sup> for example, groundwater upwelling that augments stream flow in dry summer months provides localized cooling or “thermal refugia” for migrating *adults* and rearing *juveniles*.<sup>132</sup>

**resource management:** departmental actions, policies, and programs affecting Pacific *wild salmon* directly or indirectly through their habitats and *ecosystems*.<sup>133</sup>

**retrovirus:** any of a family of single-stranded RNA viruses containing an enzyme that allows for a reversal of genetic transcription, from RNA to DNA (rather than the usual DNA to RNA).<sup>134</sup>

**returns:** catch plus *escapement*, by *ecotype*.<sup>135</sup>

**Ricker and Larkin models:** two stock-recruitment models that are frequently used to describe Fraser River sockeye population dynamics.<sup>136</sup>

**riparian zone:** area of vegetation near streams.<sup>137</sup>

**run size:** one or more stocks of the same species that survive natural *mortality* agents and return to a given freshwater system in a given year.<sup>138</sup>

**run-timing groups:** groups of fish characterized by the timing of their return migration: Early Stuart, Early Summer, Summer, and Late-run.

**salmonid:** a group of fish that includes salmon, trout, and char, belonging to the taxonomic family Salmonidae.<sup>139</sup>

**scare permit:** permit issued by Environment Canada’s Wildlife Service that authorizes the scaring away of migratory birds; used by *aquaculture* operators.<sup>140</sup>

**scouring:** physical disruption of eggs due to high stream flows generated by rainfall; a factor potentially decreasing the survival of eggs.<sup>141</sup>

**sector:** DFO sectors are national headquarters organizational divisions based on program activities;<sup>142</sup> fishing sectors refer to and distinguish commercial, *recreational*, and Aboriginal fishers.

**seine:** fishing net that hangs vertically in the water with its bottom edge held down by weights and its top edge buoyed by floats; seine nets can be deployed from the shore as a beach seine or from a boat.

**selective fishing:** *conservation*-based management approach that allows for the harvest of surplus target species or *Conservation Units* while aiming to release *bycatch* unharmed or to minimize or avoid the harvest of species or stocks for which there is conservation concern.<sup>143</sup>

**senescence:** deteriorating changes in a cell or organism with aging.<sup>144</sup>

**set net:** *gillnet* anchored in position rather than drifted or manipulated by hand.

**smolt:** *juvenile* salmon that has completed rearing in freshwater and migrated into the marine environment. A smolt becomes physiologically capable of balancing salt and water in the estuary and ocean waters. Smolts vary in size and age depending on the species of salmon.<sup>145</sup>

**somatic:** the body and its cells (as distinguished from reproductive cells).<sup>146</sup>

**spawner success:** successful reproduction by *spawners*.

**spawners:** males and females that reach the spawning grounds.<sup>147</sup>

**stewardship:** acting responsibly to conserve fish and their habitat for present and future generations.<sup>148</sup>

**stock:** aggregate of *populations* of a single species that are grouped for management purposes. Stock generally have similar migration patterns and *run timing*.<sup>149</sup>

**stock assessment:** use of various statistical and mathematical calculations to make quantitative predictions about the reactions of fish *populations* to alternative management choices.<sup>150</sup>

**stream walks:** method of estimating salmon *spawner abundance* by walking along the banks of a stream and counting the number of fish.<sup>151</sup>

**sub-adult:** not yet *adult* or *mature*.

**Summer run:** one of the four *run-timing groups* of Fraser River sockeye; the Summer-run stock group spawns in the Chilko, Quesnel, Stellako, and Stuart systems and arrives in the Lower Fraser River from mid-July to early September; the run includes Chilko, Late Stuart, Stellako, and Quesnel sockeye.<sup>152</sup>

**superimposition of eggs:** placement of eggs on or over other eggs.

**surfactant:** compounds that lower the surface tension of a liquid; or the interfacial tension between two liquids, or between a liquid and a solid.

**systemic:** in relation to disease, pertaining to the body as a whole.<sup>153</sup>

**tagging program:** program that involves tagging of fish or other animals.

**telemetry:** science and technology of automatic measurement and transmission of data by wire, radio, or other means from a distance.<sup>154</sup>

**thermal stratification:** change in temperature at different depths of a lake.

**Tier 1, Tier 2, Tier 3:** part of a three-tier process, involving discussions and organizational relationships among, respectively, First Nations only; First Nations and the federal government; and First Nations, the federal and provincial governments, and third parties.<sup>155</sup>

**total allowable catch:** estimated quantity of fish that may be harvested or used in the development of fishing plans.<sup>156</sup>

**total return:** sum of the estimated numbers of *adult* salmon of a population taken in the catch plus the

estimate of the number of *spawners* in that *population*, computed across all life-history types; sometimes called *brood-year* returns.<sup>157</sup>

**troll:** to fish by trolling; trolling is a method of fishing where one or more fishing lines, baited with lures or bait fish, are drawn through the water.

**upwelling:** oceanographic phenomenon that involves wind-driven motion of dense, colder, and usually nutrient-rich water toward the ocean surface.

**vectors:** organisms that carry *disease*-causing micro-organisms from one host to another.<sup>158</sup>

**vibriosis:** *disease* caused by infection with bacteria of the genus *Vibrio*.

**virulence:** measure of the severity of a *disease* or parasite's impact on its host's fitness.<sup>159</sup>

**visceral:** pertaining to organs located in the chest and abdomen.<sup>160</sup>

**water mass:** identifiable body of water with chemical and/or physical properties distinct from surrounding water.

**weak stocks:** fish stocks identified as having low *productivity*.<sup>161</sup>

**wild salmon:** Salmon are considered "wild" if they have spent their entire *life cycle* in the wild and originate from parents that were also produced by natural spawning and continuously lived in the wild.<sup>162</sup>

**yolk sac:** sac containing yolk (nutritious material contained in an egg) that is attached to an embryo.<sup>163</sup>

**zooplankton:** weakly swimming and drifting planktonic organisms, mostly *protozoa* and small animals such as crustaceans, which must consume *phytoplankton* (or detritus) to survive in a process called heterotrophy.<sup>164</sup>

## Notes

- 1 C.J. Walters and S.J.D. Martell, *Fisheries Ecology and Management* (Princeton, NJ: Princeton University Press, 2004).
- 2 Exhibit 261, p. 8.
- 3 Edward K. Wagner, Martinez J. Hewlett, and David C. Bloom, eds., *Basic Virology* (3rd ed., Oxford, UK: Blackwell Publishing, 2008).
- 4 Technical Report (TR) 9, pp. 24, 36.
- 5 TR 4, p. 165.
- 6 TR 10, p. 73.
- 7 TR 5D, p. 53.
- 8 J.D. McPhail, *The Freshwater Fishes of British Columbia* (Edmonton: University of Alberta Press, 2007).
- 9 Exhibit 8, p. 38.
- 10 Policy and Practice Report (PPR) 20, p. 8.
- 11 P.M.B. Walker, ed., *Chambers Dictionary of Science and Technology* (Edinburgh, UK: Chambers Harrap Publishers, 1999).
- 12 Exhibit 271, p. 17.
- 13 *Oxford Dictionary of Biology* (6th ed., Oxford, UK: Oxford University Press, 2008).
- 14 Exhibit 8, p. 38.
- 15 *Oxford Dictionary of Biology*.
- 16 TR 5D, p. 29.
- 17 TR 4, p. 165.
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