

Enhancement Related Research



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Alaska Department of Fish and Game
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Constitutional Provision for Sustained Yield



Article VIII, Sec(4). Fish, forests, wildlife, grasslands, and all other replenishable resources belonging to the State shall be utilized, developed, and maintained on the sustained yield principle, subject to preferences among beneficial uses.

Alaska Department of Fish and Game Mission Statement

To **protect**, **maintain**, and **improve** the fish, game, and aquatic plant resources of the state, and **manage** their use and development in the best interest of the economy and the well-being of the people of the state, consistent with the sustained yield principle.

It must be recognized that the welfare of people and not fish is the [reason] for a management program, and that if maximum sustained yield has any validity, it is as a means to important human ends rather than as an end in itself.

RA Cooley in *Politics and Conservation: The decline of Alaska salmon*



Working definitions

Sustainable development

Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

- *Brundtland Commission, UN 1987*

Can substitute “fishery” for “development” in this definition

Definition Policy for the management of sustainable salmon fisheries 5 AAC 39.222(c)(5)

(5) in the face of uncertainty, salmon stocks, fisheries, artificial propagation, and essential habitats shall be managed conservatively as follows:

(A) a precautionary approach, involving the application of prudent foresight that takes into account the uncertainties in salmon fisheries and habitat management, the biological, social, cultural, and economic risks, and the need to take action with incomplete knowledge, should be applied to the regulation and control of harvest and other human-induced sources of salmon mortality; a precautionary approach requires

(i) consideration of the needs of future generations and avoidance of potentially irreversible changes;

(ii) prior identification of undesirable outcomes and of measures that will avoid undesirable outcomes or correct them promptly;

(iii) initiation of any necessary corrective measure without delay and prompt achievement of the measure's purpose, on a time scale not exceeding five years, which is approximately the generation time of most salmon species;

(iv) that where the impact of resource use is uncertain, but likely presents a measurable risk to sustained yield, priority should be given to conserving the productive capacity of the resource;

(v) appropriate placement of the burden of proof, of adherence to the requirements of this subparagraph, on those plans or ongoing activities that pose a risk or hazard to salmon habitat or production;

(B) a precautionary approach should be applied to the regulation of activities that affect essential salmon habitat.

Working definitions

Precautionary Principle

Rule or Standard

When human activities may lead to morally unacceptable harm that is scientifically plausible but uncertain, actions shall be taken to avoid or diminish that harm.

- *COMEST/UNESCO*

Precautionary Approach

Method

A set of agreed cost-effective measures and actions, including future courses of action, which ensures prudent foresight, reduces or avoids risk to the resources, the environment, and the people, to the extent possible, taking explicitly into account existing uncertainties and the potential consequences of being wrong.

- *S. Garcia, FAO Fisheries Dept*



Definition Precautionary Approach

SSFP 5 AAC 39.222(c)(5)(A)

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Prudent foresight accounts for:

1. Uncertainty
 - a) Fisheries
 - b) Habitat
2. Risk
 - a) Biological
 - b) Social
 - c) Cultural
 - d) Economic
3. Need to act with incomplete knowledge

Definition in SSFP 5 AAC 39.222(c)(5)

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Principle → (i) consideration of the needs of future generations and avoidance of potentially irreversible changes;

Prudence → (ii) prior identification of undesirable outcomes and of measures that will avoid undesirable outcomes or correct them promptly;

Promptness → (iii) initiation of any necessary corrective measure without delay and prompt achievement of the measure's purpose, on a time scale not exceeding five years, which is approximately the generation time of most salmon species;

Priority → (iv) that where the impact of resource use is uncertain, but likely presents a measurable risk to sustained yield, priority should be given to conserving the productive capacity of the resource;

Process → (v) appropriate placement of the burden of proof, of adherence to the requirements of this subparagraph, on those plans or ongoing activities that pose a risk or hazard to salmon habitat or production;

(B) a precautionary approach should be applied to the regulation of activities that affect essential salmon habitat.

Straying and Homing in Salmon Life History



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Pacific salmon: a balance of homing and straying

- Homing selection
 - Development of local adaptations
 - Increased among-population diversity
 - Increased survival – successful area, familiarity with area
- Straying selection
 - Colonization of new habitats
 - Increased within-population diversity
 - Buffers temporal variation in habitat quality



Pacific salmon: a balance of homing and straying

- Differ among species
 - Variability of the spawning grounds
 - Stability of the spawning grounds
 - How long and what freshwater resources are used

Sockeye salmon: Long freshwater residency, higher variability in habitat, higher annual stability in habitat, variable-year life cycle = higher selection for homing

Beach



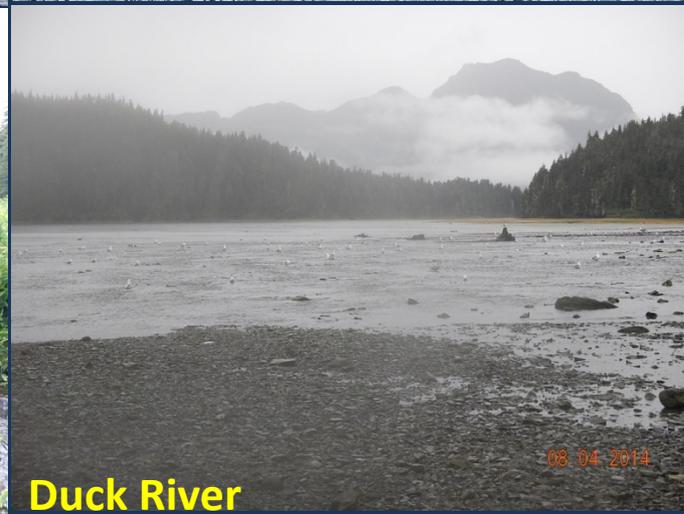
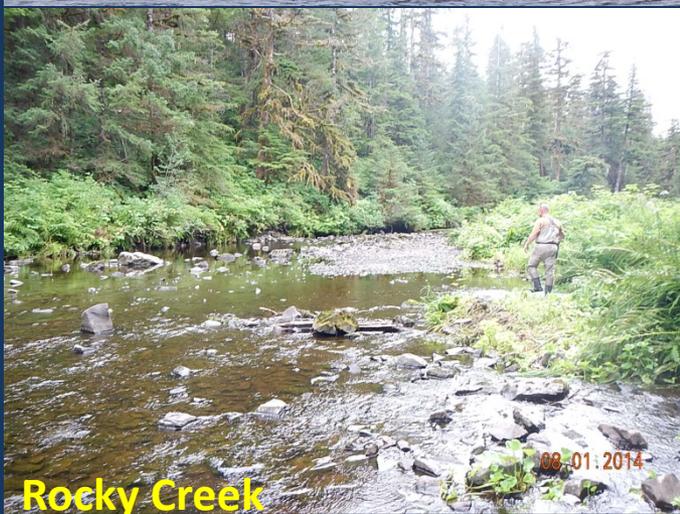
River



Stream



Pink salmon: Short freshwater residency, lower variability in habitat, lower annual stability in habitat, one-year life cycle = lower selection for homing



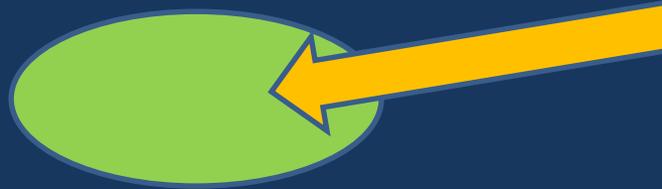


Pacific salmon: a balance of homing and straying

- Differ among species
 - Variability of the spawning grounds
 - Stability of the spawning grounds
 - How long and what freshwater resources are used
- Differ across distance and timing
 - Fish generally stray more closer to home
 - Fish return at a similar time of year as parents
- Depth of genetic structure correlated to homing
 - Sockeye salmon: deep structure = home more precisely
 - Pink salmon: shallow structure = home less precisely

Stray Rate definitions: depends on perspective

- Stray in rate = recipient stray rate
 - Proportion of fish in a spawning location that did not come from that location



- Stray out rate = donor stray rate
 - Proportion of fish from a spawning location that did not return to that location

