

Appendix I

Glossary

California Hatchery Review Project

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Acclimation pond	Concrete or earthen pond or a temporary structure used for rearing and imprinting juvenile fish in the water of a particular stream before their release into that stream.
ACID	Anderson Cottonwood Irrigation District; operators of a diversion dam and fish passage facilities on the Sacramento River at Redding, California.
Adipose fin	a small fleshy fin with no rays, located on the posterior dorsal between the dorsal and caudal fins, and present in salmonids such as salmon and trout.
AFRP	Anadromous Fish Restoration Program; a program of the Central Valley Project Improvement Act tasked with making "all reasonable efforts to at least double natural production of anadromous fish in California's Central Valley streams on a long-term, sustainable basis".
Anadromous (anadromy)	Fish which hatch and rear in fresh water, migrate to the ocean to grow and mature, and return to fresh water to spawn.
BKD	Bacterial Kidney Disease. A disease of salmonids caused by the bacterium <i>Renibacterium salmoninarum</i> . The bacterium can be passed between juvenile fish where they are concentrated in hatcheries and in transportation systems and can be passed to the next generation by an infected female.
Broodstock	Adult fish used by hatcheries to propagate the next generation of fish.
Coded wire-tag	A magnetically detectable wire etched with a distinctive numeric code implanted in the nose of a young fish, which, when retrieved, allows for the identification of the origin of the fish bearing the tag.
DPS	Distinct Population Segment. A group of steelhead trout that is (1) substantially reproductively isolated from other conspecific units and (2) represents an important component of the evolutionary legacy of the species.
ESA	Endangered Species Act. A 1973 act of congress mandating that endangered and threatened species of fish, wildlife, and plants be protected and restored.

ESA recovery plan	A plan to recover a species listed as threatened or endangered under the ESA. Plans must, at a minimum, contain (1) site-specific management actions necessary to achieve the plan's goal; (2) objective, measurable criteria which, when met, would result in a determination that the species should be removed from the list; and (3) estimates of the time required and cost to carry out the actions needed to achieve the plan's goal.
Escapement	The portion of a freshwater run for an anadromous species that is not harvested and escapes to natural or artificial spawning areas.
ESU	Evolutionarily Significant Unit. A group of Pacific salmon that is (1) substantially reproductively isolated from other conspecific units and (2) represents an important component of the evolutionary legacy of the species.
Eyed egg	A fish egg containing an embryo that has developed to the point where the eyes are visible through the egg membrane.
Fecundity	Eggs per female.
Fingerlings	In California, a subyearling hatchery fish released as a subyearling during early spring (Central Valley) or early summer (Klamath-Trinity system).
Fish collection/handling facility	Facility where adult salmon and steelhead are separated by species and then passed to holding ponds or raceways until they are spawned or returned to the river.
Fitness (Individual)	The mean number of adult, or sexually mature offspring, produced by an individual organism. Individual fitness is the multiplicative product of two probabilistic components: (1) viability fitness, which measures the probability that an individual will survive to sexual maturity from zygote formation, and (2) reproductive fitness, the expected number of sexually mature offspring that the individual will produce after attaining sexual maturity. Individual fitness is a function of the individual's genotype (genetic makeup at zygote formation) and the environments to which that organism is exposed throughout its lifetime.
Fitness (Population)	The mean fitness of all individual within a population that interbreed when mature within a common environment.
Fry	A stage of development in young salmon or trout. During this stage the fish is usually less than one year old, has absorbed its yolk sac, and is rearing in the stream.

Grilse	A precocious or early-maturing age-2 salmon; also called a jack.
Half-pounder	Steelhead that return to their natal stream from the ocean sexually immature. A life-history variant in the Klamath/Trinity system.
Hatchery-origin fish	Fish resulting from artificial reproduction of fish spawned in the hatchery environment.
Hatchery production	The total number of hatchery fish produced that survive to a specified life stage. (<i>contrast natural production</i>)
HOB	The number of hatchery-origin fish used as hatchery broodstock.
HOS	The number of hatchery-origin fish spawning naturally.
Homing	The ability of a salmon or steelhead to correctly identify and return to their natal stream, following maturation at sea.
Imprinting	The physiological and behavioral process by which migratory fish assimilate environmental cues to aid their return to their stream of origin as adults.
Integrated hatchery program	A hatchery program with the intent to maintain the genetic characteristics of a local, natural population among hatchery-origin fish by minimizing the genetic effects of domestication.
Jack	A precocious or early maturing age-2 salmon; most are males. Also called grilse.
Kelt	A spent or spawned out steelhead trout.
Local adaptation	The evolutionary product of natural selection for a population that inhabits and reproduces within a specific environment for many generations until a genetic-environmental equilibrium is established where the phenotypic means of the population equal, or approximately equal stochastically, the phenotypic optima that confer maximum fitness for the species in the specified environment.
Natal stream	Stream of origin.
Natural-origin fish	Fish resulting from natural reproduction of fish spawning in the natural environment.
NOB	The number of natural-origin fish used as hatchery broodstock.
NOS	The number of natural-origin fish spawning in natural areas.

Natural production	The total number of natural area-produced fish that survive to a specified life stage. (<i>contrast hatchery production</i>)
Outmigration	The downstream migration of juvenile fish toward the ocean.
Parr	The developmental life stage of salmon and trout between alevin and smolt when the young have developed parr marks and are actively feeding in fresh water.
pHOS	Proportion of natural area spawners composed of hatchery-origin fish. Equals $HOS/(NOS + HOS)$.
PIT-Tag	Passive Integrated Transponder tags are used to identify individual salmon for monitoring and research purposes. This miniaturized tag consists of an integrated microchip that is programmed to include specific fish information. The tag is inserted into the body cavity of the fish and decoded at selected monitoring sites.
PNI	Proportionate natural influence on a composite hatchery-/natural-origin population. Equals $pNOB/(pNOB + pHOS)$.
pNOB	Proportion of hatchery broodstock composed of natural-origin fish. Equals $NOB/(HOB + NOB)$.
Recruitment	The stage at which a juvenile has survived long enough to become part of (i.e., recruited into) a population or an exploitable segment of a population.
Recruits	The total number of fish of a specific stock available at a particular stage of their life history.
Recruits per spawner	The ratio of fish returning to an area over the number that spawned in the previous (i.e., parental) generation. A measure of stock productivity.
Redd	A salmon or steelhead spawning nest in gravel in which eggs are deposited.
Residualism	When an anadromous steelhead forgoes smoltification and maintains a resident trout life-history.
SAR	Smolt to adult return rate, measured from the point where a juvenile fish is released or captured to their return to the same point as an adult.
Segregated hatchery program	A hatchery program with the intent to maintain a genetically distinct hatchery population. As defined by the California HSRG, pHOS must be equal to zero for segregated hatchery programs.

Smolt	The salmonid or trout developmental life stage between parr and adult, which the juvenile is at least one year old and is undergoing adaptations to the marine environment.
Straying	1) With respect to natural-origin fish, straying is a natural phenomena whereby some adult spawners do not return to their natal stream, but instead enter and spawn in some other stream; 2) as used by the California HSRG, straying is a failure to return to the hatchery or near the vicinity of the hatchery at which fish were spawned and reared. Straying may be increased by the off-site release of hatchery fish.
Sustainable	1) With respect to fishery harvest rates, “sustainable” harvest rates are those that a natural population can withstand without continued declines in abundance and, eventually, theoretical extinction due to fishing; 2) with respect to salmon and steelhead hatchery operations, “sustainable” hatchery operations are those that allow for the long-term persistence of natural populations while resulting in sufficient numbers of anadromous adults returning to the facility for program perpetuation; 3) with respect to the Central Valley AFRP, a natural population is defined as “sustainable” if it is “capable of being maintained at target levels without direct human intervention in the spawning, rearing or migration processes.”
Terminal Fishery	A fishery that takes place in freshwater and is directed on mature fish enroute to spawning grounds or hatcheries.