Appendix A. Glossary of Terms and Abbreviations

A

Absolute Abundance - The total number of individuals in a population. This is rarely known, but usually estimated from relative abundance, although other methods may be used.

Abundance - See **Relative Abundance** or **Absolute Abundance**

Adaptive Management - In regard to a marine fishery, adaptive management is a scientific policy that seeks to improve management of biological resources, particularly in areas of scientific uncertainty, by viewing program actions as tools for learning. Actions are designed so that even if they fail, they will provide useful information for future actions. Monitoring and evaluation shall be emphasized so that the interaction of different elements within the system can be better understood.

Age Class - A group of individual organisms of the same age in a population. "Year-Class" or "cohort" are terms generally synonymous with age class, but are identified by the actual year in which the cohort was produced (e.g., 1991 year-class or sardines resulted from the 1991 spawning season).

Age Composition - Identifies the proportions of a population of fishes by age or age group.

Allocation - The opportunity to fish is distributed among user groups or individuals. The share that a user group receives is sometimes based on historic harvest amounts.

Altricial - A term used to describe the developmental pattern in birds in which newly hatched young are relatively immobile, have closed eyes, lack down, and must be cared for by the adults. Altricial young are born helpless and stay in the nest for a comparatively long time.

Allowable Biological Catch (ABC) - A term used that refers to the range of allowable catch for a species or species group. It is set each year by a scientific group created by the management agency. The agency then takes the ABC estimate and sets the annual Total Allowable Catch (TAC).

Assessment - A judgment made by a scientist or scientific body on the state of a resource (e.g., size, health, pollution impacts) usually for passing advice to management authority.

Availability - In a general sense, used to describe periods of poor (low availability) or good (high availability) catches, regardless of the size or health of a fish population. In a strict sense, it refers to the fraction of a population which is susceptible to fishing during a given fishing season.

B

Biomass - The total weight or numbers of a stock or population of fish at a given point in time. The **spawning biomass** is that portion of total biomass that is mature and spawning.

Brail net - A large dip net, sometimes used with the assistance of the vessel's hydraulics.

Bycatch - Fish or other marine life that are taken in a fishery but which are not the target of the fishery, including discards.

C

CalCOFI - California Cooperative Oceanic Fisheries Investigations.

Candidate Species - Officially noticed by the Commission as being under review by the Department of Fish and Game for addition to the rare, threatened, or endangered species lists.

Capacity Goal - The primary purpose of restricted access programs is to match the level of effort in a fishery to the health of the fishery resource, each restricted access program that is not based on individual transferable quotas shall identify a fishery capacity goal intended to promote resource sustainability and economic viability of the fishery.

Catch - Refers sometimes to the total amount (numbers or weight) caught, and sometimes only to the amount landed or kept. Catches that are not landed are called discards.

Catchability - A value that modifies a unit of fishing effort in the calculation of fishing mortality which usually will depend on the habits of the fish, its abundance, and the type and deployment of fishing gear.

Catch Per Unit Effort (CPUE) - The catch obtained by a vessel, gear or fisherman per unit of fishing effort (e.g., number of fish caught per hour of trawling).

CCR - California Code of Regulations.

CDFG - California Department of Fish and Game.

CEQA - California Environmental Quality Act.

Cohort - A group of fish spawned during a given period, usually within a year. See also: **age class**.

Commission - California Department of Fish and Game Commission.

Compensatory Mechanism - A process by which the effect of one factor on a population tends to be compensated for by a change in another factor. For example, a reduction in the egg production (spawning) may be compensated for by an increase in the survival rate of eggs.

Competition - Active demand between organisms for a common resource that is in limited supply (e.g., food, space).

CPFV - Commercial Passenger Fishing Vessel.

CPS - Coastal pelagic species (northern anchovy, jack mackerel, Pacific mackerel, Pacific sardine, and market squid).

D

Density Dependence - When the density of a population of organisms directly affects other processes, which can then affect the abundance of that population. For example, a reduction in the numbers of a population might lead to increased growth per individual (because of earlier maturity).

Department - California Department of Fish and Game.

Depletion Methods - These methods are based on the principle that a decrease in CPUE over time and for finite periods of time (usually years or seasons) bears a direct relationship to the extent of the decrease of the population. If this assumption is true, and a substantial proportion of the population is being removed over time, then this method can be used to estimate the population present at the beginning of that time.

Depressed - With regard to a marine fishery, the condition of a fishery for which best available scientific and other relevant information indicates a declining population trend has occurred over a period of time appropriate to that fishery. With regard to fisheries for which management is based on maximum sustainable yield,

or in which a natural mortality rate is available, "depressed" means the condition of a fishery that exhibits declining fish population abundance levels below those consistent with maximum sustainable yield.

Direct Enumeration - The counting of individuals in a population through direct visual observations, or through the use of such aids as sonar or video. Typically involves estimating species density along sampling transects, and applying the result to an entire survey area in order to estimate abundance. These methods have only limited value for the marine resource manager. Their usefulness has generally been limited to enclosed (freshwater) or anadromous (e.g., salmon) resources, where direct observations and subsequent counts can result in estimates of abundance.

Discards - Fish that are taken in a fishery but are not retained because they are of an undesirable species, size, sex, or quality, or because they are required by law to be released.

Drum seine - Like a purse seine, but a large drum stores, deploys, and retrieves the net.

E

Ecosystem - The relationships between the sum total biological and non-biological factors present in the area.

EEZ - Exclusive economic zone; consists of ocean waters from the edge of State waters three miles (5 km) to 200 miles (322 km) offshore.

Effort - The amount of time and fishing power used to harvest fish. Fishing power includes gear size, boat size, and horsepower.

Egg and Larval Surveys - Involves the collection of larvae, usually with a tow net, within a predefined geographic area. These surveys are typically carried out in conjunction with other studies in order to determine fishery information such as abundance and recruitment. They can also be used to define the geographic extent and peak time of spawning activity.

Egg Production Method - While this method is very expensive, it can provide a real-time, fishery-independent estimate of spawning biomass, that is directly calculated from population reproductive values that are measured by extensive at-sea sampling of eggs and adults on the spawning grounds.

EIR - Environmental Impact Report.

El Niño - An El Niño event occurs when the sea surface temperatures in the eastern equatorial Pacific region along the coasts of Peru and Ecuador increase significantly above the average temperature for three or more months. A La Niña is characterized by unusually cold ocean temperatures in the equatorial Pacific. Currently, El Niños have a return period of four to five years. An El Niño Southern Oscillation (ENSO) describes the full range of the Southern Oscillation that includes both warming and cooling of sea surface temperatures when compared to a long-term average. The ENSO has two parts: the El Niño is the oceanic component and the Southern Oscillation is the atmospheric component of the phenomenon.

Endangered Species - A native species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant which is in serious danger of becoming extinct throughout all, or a significant portion, of its range due to one or more causes, including loss of habitat, change in habitat, overexploitation, predation, competition, or disease.

ENSO - El Niño Southern Oscillation. See El Niño.

Equilibrium Yield - The yield in weight taken from a fish stock when it is in equilibrium with fishing at a given intensity and its abundance is not changing from year to year. Also called **sustainable yield**.

Escapement - That part of the stock which survives at the end of a fishing period (e.g., season, year).

Essential Fishery Information - Information about fish life history and habitat requirements; the status and trends of fish populations, fishing effort, and catch levels; fishery effects on fish age structure and on other living marine resources and users; and any other information related to the biology of a fish species or to taking in the fishery that is necessary to permit fisheries to be managed according to the requirements of §7060 FGC.

Ex-vessel - Refers to activities that occur when a commercial fishing boat lands or unloads a catch. For example, the price received by a captain for the catch is an ex-vessel price.

F

Fecundity - The production of eggs per individual or per unit weight of an individual.

FGC - Fish and Game Code.

Fishery- Both of the following:
(a) One or more populations of marine fish or marine plants that may be treated as a unit for purposes of conservation and management and that are identified on the

basis of geographical, scientific, technical, recreational, and economic characteristics.
(b) Fishing for, harvesting, or catching the populations described in (a).

Fishing Effort - The amount of effort expended by a gear or person which is usually standardized (e.g., number of net hauls per unit of time per size of net) and summed before being used as an index of total effort. Also see **Effort**.

Fishing Mortality (F) - A measurement of the rate of removal of fish from a population by fishing. Fishing mortality can be reported as either annual or instantaneous. Annual mortality is the percentage of fish dying in one year. Instantaneous is that percentage of fish dying at any one time. The acceptable rates of fishing mortality may vary from species to species.

Fledgling - A young bird that has recently left the nest and become capable of flight, but is usually still under the care of an adult bird.

FMP - Fishery Management Plan.

G

Growth Overfishing – A reduction in the proportion of fish caught that is not compensated for by a corresponding increase in their average size. This is more likely to occur when a fishery is taking too many younger individuals.

Growth Rate - Usually refers to the average growth of individuals, in length or weight by successive ages over the life span of the particular species.

H

Habitat - The physical, chemical, and biological features of the environment where an organism lives.

Habitat Enhancement – The improvement of habitat, typically for the benefit of a select number of species which depend on that habitat. Wetlands restoration, artificial reefs, and kelp reforestation are examples of habitat enhancement.

Hook and Line - Includes trolling, jigging, and longline gear types.

I

Incidental Catch - See **Bycatch**

Incidentally-Taken Species - See **Bycatch**

Indices of Abundance - These measures usually do not translate to an estimate of actual biomass of a population, and are usually collected over time (years) to reflect trends in a population. The indices can be compiled from a number of sources, usually reported annually (e.g., CPUE, aerial spotter, and acoustic, egg, larval, or adult research survey data). Indices of abundance, because of their simplicity, are seriously evaluated regarding the assumptions in their calculation. When they can be closely matched to more direct and precise of estimates of abundance, they can be cost-effective tools of tracking the trends of a population.

J
K
L

Lampara net – A round haul net with the sections of netting made and joined to create bagging. The net is pushed beneath squid to encircle it from each side. The "wings" of the net are pulled back to the boat and the squid end up in the bag portion of the net. This gear has no arrangement for pursing.

La Niña - A La Niña is characterized by unusually cold ocean temperatures in the equatorial Pacific. See El Niño.

Landings - The number or weights of fish unloaded at a dock by commercial fishermen or brought to shore by recreational fishermen for personal use. Landings are reported at the points at which fish are brought to shore. Note that landings, catch, and harvest define different things.

Limited Entry - Restriction of the right to participate in a fishery, by the use of permits or other means.

Living Marine Resources - Includes all wild mammals, birds, reptiles, fish, and plants that normally occur in or are associated with salt water, and the marine habitats upon which these animals and plants depend for their continued viability.

M

Marine Mammals - Animals that live in marine waters and breathe air directly. Females give live birth and can produce milk. Includes porpoises, whales, and seals.

Maximum Sustainable Yield - In a marine fishery, it means the highest average yield over time that does not result in a continuing reduction in stock abundance, taking into account fluctuations in abundance and environmental variability.

Mesh Size - The size of openings in a fishing net. Minimum mesh sizes are often prescribed in an attempt to avoid the capture of young fish before they reach their optimal size for capture.

MLMA - Marine Life Management Act.

Mortality (Total) - The sum total of individual deaths within a population. Usually it is stated as an annual rate and calculated as the sum of deaths due to natural causes (e.g., predation, disease), fishing mortality (deaths due to fishing and natural mortality), and nonfishing, artificial causes (e.g., pollution, seismic surveys).

MSFMP – Market Squid Fisheries Management Plan.

N

NOP - Notice of Preparation.

NMFS - National Marine Fisheries Service or NOAA Fisheries.

O

Optimal Sustainable Yield - A sustainable yield that takes into account biological, social, and political values, and the effect of harvesting on dependent or associated species, in an attempt to produce the maximum benefit to society from a stock of fish.

Optimum Yield - With regard to a marine fishery, means the amount of fish taken in a fishery that does all of the following:

(a) Provides the greatest overall benefit to the people of California, particularly with respect to food production and recreational opportunities, and takes into account the protection of marine ecosystems.
(b) Is the maximum sustainable yield of the fishery, as reduced by relevant economic, social, or ecological factors.
(c) In the case of an overfished fishery, provides for rebuilding to a level consistent with producing maximum sustainable yield in the fishery.

Overfished - With regard to a marine fishery, means both of the following:

(a) A depressed fishery.
(b) A reduction of take in the fishery is the principal means for rebuilding the population.

Overfishing - A rate or level of taking that the best available scientific information, and other relevant information that the Commission or Department possesses or

receives, indicates is not sustainable or that jeopardizes the capacity of a marine fishery to produce the maximum sustainable yield on a continuing basis.

P

Paralarvae – Life stage of market squid at the time of hatching (hatchlings).

Participants - The sport fishing, commercial fishing, and fish receiving and processing sectors of the fishery.

Pelagic - Pertaining to the water column, or referring to organisms living in the water column.

Performance Standard - A qualitative and/or quantitative standard used to judge whether the performance of a particular individual, tool, or process is functioning properly. The standard used must be objective and readily detectable. In fisheries biology, a performance standard used to gauge a specific management process could be the long-term recruitment success of a particular species as measured through a standard biological survey method.

PFMC - Pacific Fishery Management Council.

Population (see **Stock**) - A species, subspecies, geographical grouping, or other category of fish capable of management as a unit.

Predator - A species that feeds on other species. The species being eaten is the prey.

Prey - A species being fed upon by other species. The species eating the other is the predator.

Productivity - Generally used to refer to the capacity of a stock to provide a yield.

PSMFC - Pacific States Marine Fisheries Commission.

Purse Seine - A net used to encircle aggregations of fish by closing the bottom of the net. The net is continuous, with corks along the top and leads along the bottom. Purse seines have a drawstring running the length of the lead line, which is pulled tight after the set.

Q

Quota - A limit on the amount of fish which may be landed in any one fishing season or year. May apply to the total fishery or to an individual share.

R

Recreational Fishery - Harvesting fish for personal use, fun, and challenge. Recreational fishing does not permit sale of catch. Refers to and includes the fishery resources, fishermen, and businesses providing needed goods and services.

Recruit - A relatively young fish entering the exploitable stage of its life cycle.

Recruitment - Either the rate of entry of recruits into the fishery or the process by which such recruits are generated. Usually associated with attainment of a particular age or size, but can also be dependent on such factors as the fishes' appearance on a particular fishing ground, or how they grow to a size large enough to be captured by a certain mesh gear.

Relative Abundance - An estimate of biomass usually measured by indices that track trends in population biomass over time. This method is neither a direct nor usually precise estimate.

Restricted Access - A fishery in which the number of persons who may participate, the number of vessels that may be used in taking a specified species of fish, or the catch allocated to each fishery participant is limited by statute or regulation.

S

Selectivity - Refers to the selective nature of fishing gear in that almost all kinds of gear catch fish of some sizes more readily than other sizes.

SFAC - Squid Fishery Advisory Committee.

Spawning Biomass - See **Biomass**

Spermatophore - A capsule or compact mass of spermatozoa extruded by the males of certain invertebrates and directly transferred to the reproductive parts of the female.

SRSC - Squid Research and Scientific Committee.

Stock - A species, subspecies, geographical grouping, or other category of fish capable of management as a unit.

Survival Rate - Number of fish alive after a specified time interval (usually a year) divided by the initial number.

Sustainable, Sustainable Use, and Sustainability - with regard to a marine fishery, both of the following:

(a) Continuous replacement of resources, taking into account fluctuations in abundance and environmental variability.
(b) Securing the fullest possible range of present and long term economic, social, and ecological benefits; maintaining biological diversity; and, in the case of fishery management based on maximum sustainable yield, taking in a fishery that does not exceed optimum yield.

T

Threatened Species - a native species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant that, although not presently threatened with extinction, is likely to become an endangered species in the foreseeable future in the absence of the special protection and management efforts.

Total Allowable Catch (TAC) - The annual recommended catch for a species or species group. The regional council sets the TAC from the range of the Allowable Biological Catch (ABC).

Total Length - The straight-line distance from the most forward tip of the snout to the end of the tail fin, when the mouth is closed and the lobes of the tail fin are squeezed together.

Trawl - A large bag net that is tapered and forms a flattened cone. The mouth of the net is kept open while it is towed or dragged over the sea bottom.

Trophic Level - Position in the food chain, determined by the number of energy-transfer steps to that level.

U

USC - United States Code.

V

Y

Year Class - see Age Class.

Yield - Sometimes this term is synonymous with catch, but it more often implies a degree of sustainability over a number of years.

Yield-Per-Recruit - The expected lifetime yield per fish of a specific age. The yield is usually expressed in weight for each recruit. For a given species with a specific growth curve, and constant natural mortality, the yield-per-recruit will vary as a function of age at first capture and fishing mortality.

Yield-Per-Recruit Model - This model can be used to predict the yield from any given level of recruitment if just the natural mortality, present fishing mortality, and growth rates can be estimated. Furthermore, this model can be manipulated to estimate yields for any combination of natural mortality, fishing mortality, and age-at-first-capture. This information could then allow management to adjust mesh sizes, and thus age-at-first-capture, to provide for maximum or optimal yield-per-recruit regardless of population size.