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ACRONYMS AND ABBREVIATIONS

The following acronyms and abbreviations are used in the text or in bibliographic citations.

Agencies and Organizations

ABC – American Bird Conservancy
BLM – Bureau of Land Management
CCC – Civilian Conservation Crew
CDF – California Department of Forestry and Fire
CDFW – California Department of Fish and Wildlife
CDPR – California Department of Pesticide Regulation
DOI – United States Department of the Interior
EPA – United States Environmental Protection Agency
FWS – United States Fish and Wildlife Service
IUCN – International Union for Conservation of Nature
NPS – United States National Park Service
SEKI – Sequoia and Kings Canyon National Parks
SNARL – Sierra Nevada Aquatic Research Laboratory
USFS – United States Forest Service
USGS – United States Geological Survey
YOSE – Yosemite National Park

Other Acronyms Used

aPAD – Acute Population Adjusted Dose
BLMS – BLM Sensitive
BMP – Sequoia and Kings Canyon National Parks Backcountry Management Plan, 1986
CC – California Candidate Species
CE – California Endangered
CEQ – Council on Environmental Quality
CEQA – California Environmental Quality Act
CESA – California Endangered Species Act
CNPS – California Native Plants Society
CP – California Protected
cPAD – Chronic Population Adjusted Dose
CSC – California Special Concern
CT – California Threatened
CWL – California Watch List
DEIS – Draft Environmental Impact Statement
DFS – Department of Forestry Sensitive
DGEE – Diethylene Glycol Ethyl Ether
DO – Dissolved Oxygen
DOC – Dissolved Oxygen Content
DWLOC – Drinking Water Level of Concern
EA – Environmental Assessment
EDWC – Estimated Drinking Water Concentration
EIS – Environmental Impact Statement
ESA – United States Endangered Species Act of 1973, as amended
FC – Federal Sensitive (former C2)
FCS – Federal Candidate Species
FE – Federal Endangered

FS – Forest Service Sensitive
 FT – Federal Threatened
 FEIS – Final Environmental Impact Statement
 GMP – Sequoia and Kings Canyon National Parks Final General Management Plan and Final Environmental Impact Statement, 2007
 LC50 – median Lethal Concentration
 LOC – Level of Concern
 LOAEL – Lowest Observed Adverse Effect Level
 MD – Management Directive
 MOE – Margin of Exposure
 MRA – Minimum Requirement Analysis
 MYLF – Mountain yellow-legged frogs
 N/A – Not Applicable
 ND – Not Detectable
 NEPA – National Environmental Policy Act of 1969
 NF – National Forest
 NMP – N-Methyl-Pyrrolidone
 NOAEL – No Observed Adverse Effect Level
 NOEL – No Observed Effect Level
 NOI – Notice of Intent
 NPDES – National Pollution Discharge Elimination System
 NPOMA – National Park Omnibus Management Act
 NTU – Nephelometric Turbidity Units
 PIT – Passive Integrated Transponder
 R – Rare (California)
 RfD – Reference Dose
 RMP – Sequoia and Kings Canyon National Parks Natural and Cultural Resources Plan, 1999
 SAR – Search and Rescue
 UF – Uncertainty Factor
 USC – United States Code

Unit Abbreviations

mm - millimeter	lbs - pounds
cm - centimeter	ac – acre
m - meter	ha – hectare
km – kilometer	hr – hour
ft – foot/feet	min - minute
mi - mile	°C – degrees Celsius
µg - microgram	°F – degrees Fahrenheit
mg – milligram	ppb – Parts Per Billion
g - gram	ppm – Parts Per Million
kg - kilogram	ppt – Parts Per Trillion
ml - milliliter	SVL – Snout to Vent Length
l - liter	

GLOSSARY

abundance – a measure of the total number of individuals of a particular species in a defined area, population, or community.

adaptive management - a principle that incorporates monitoring and research into conservation actions. Specifically, it is the integration of planning, management and monitoring to test assumptions in order to adapt and learn. Also, a systematic process for continually improving management policies and practices by learning from the outcomes of operational programs.

algae - one-celled (phytoplankton) or multi-cellular plants either suspended in water (plankton) or attached to rocks and other substrates (periphyton). Algae are an essential part of the lake ecosystem and provide the food base for most lake organisms including fish. Phytoplankton populations vary widely from day to day because its life cycles are short.

application concentration – the amount of a particular substance (e.g., rotenone) in a given amount of another substance (e.g., water) when applied to an aquatic system. For example, when a CFT Legumine™ formulation containing 5% rotenone active ingredient is used to remove undesirable fish from a waterbody, the Environmental Protection Agency requires that it is applied with the proper amount of product in relation to the volume of water being treated, such that the water dilutes the CFT Legumine™ to a concentration of no more than 1 part per million in streams (= 50 parts per billion rotenone) and 4 parts per million in lakes (= 200 parts per billion rotenone). Rotenone is so effective at causing mortality to fish that it can be applied at extremely low application concentrations.

amphibian chytrid fungus – the fungal pathogen (*Batrachochytrium dendrobatidis*), which causes a highly infectious disease (chytridiomycosis) in many amphibian species. It was first scientifically described in 1998 and has been shown to be a major factor contributing to global amphibian declines.

backcountry - more remote, roadless, and less intensely used park areas where the majority of use is by overnight campers who hike or ride stock. Backcountry includes federally designated wilderness.

benthic - relating to or characteristic of the bottom of a lake, deep river or sea. The benthic community is composed of a wide range of plants, animal and bacteria from all levels of the food web.

best available technology - technology that will help achieve efficient and economically viable facilities and services, while offering the greatest protection and environmental benefit for park visitors, employees, resources and values.

biological integrity – the ability to support and maintain a balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of a natural habitat of the region.

biota - the combined plant and animal life of a particular region.

climate change - the long-term shift in weather patterns in a specific region or globally, such as precipitation, temperatures, cloud cover and other parameters. According to the scientific experts in the field of climatology, climate change is caused by human activities that have resulted in an increased concentration of greenhouse gases in our atmosphere, including carbon dioxide, water vapor, methane, ozone, and nitrous oxide.

community composition – The assortment of species or taxa that comprise an ecological community.

CFT Legumine™ - an emulsifiable liquid fish toxicant manufactured by Envincio, LLC. The active ingredient is rotenone (5.0%). The formula also includes a proprietary emulsifier and solvent package for chemical delivery in aquatic habitats.

chytridiomycosis – a highly infectious disease caused by the fungal pathogen (*Batrachochytrium dendrobatidis*), also known as amphibian chytrid fungus. This disease causes high rates of mortality in post-metamorphic mountain yellow legged frogs after aquatic zoospores penetrate the keratinized skin of animals or mouthparts of tadpoles.

chytrid fungus – (see *amphibian chytrid fungus* and *chytridiomycosis*)

conserve - to protect from loss or harm; preserve. Historically, the terms conserve, protect, and preserve have come collectively to embody the fundamental purpose of the NPS—preserving, protecting and conserving the national park system.

copepod - a tiny crustacean that lives among plankton and is an important food source to many organisms.

critical habitat - specific areas within a geographical area occupied by a threatened or endangered species which contain those physical or biological features essential to the conservation of the species, and which may require special management considerations or protection; and specific areas outside the geographical area occupied by the species at the time of its listing, upon a determination by the Secretary of the Interior that such areas are essential for the conservation of the species. (See 16 USC 1342)

cultural landscape - a geographic area, including both cultural and natural resources and the wildlife or domestic animals therein, associated with a historic event, activity, or person, or exhibiting other cultural or esthetic values. There are four non-mutually exclusive types of cultural landscapes: historic sites, historic designed landscapes, historic vernacular landscapes, and ethnographic landscapes.

cultural resource - an aspect of a cultural system that is valued by or significantly representative of a culture, or that contains significant information about a culture. A cultural resource may be a tangible entity or a cultural practice. Tangible cultural resources are categorized as districts, sites, buildings, structures, and objects for the National Register of Historic Places, and as archeological resources, cultural landscapes, structures, museum objects, and ethnographic resources for NPS management purposes.

distribution – the geographical area (i.e., range) within which a taxon or other group of organisms occurs.

diversity – the species richness of a community or area.

Draft Environmental Impact Statement (DEIS) - a document that describes and assesses the impacts of proposed alternative actions and is available for public comment for a minimum of 60 days.

ecological function – the services provided to an ecosystem by one of its components (e.g., organisms).

ecosystem - a discrete unit that consists of living and non-living parts, interacting to form a stable system. Fundamental concepts include the flow of energy via food-chains and food-webs, and the cycling of

nutrients biogeochemically. Ecosystem principles can be applied at all scales. Principles that apply to an ephemeral pond, for example, apply equally to a lake, an ocean, or the whole planet.

effect - the result of actions on natural and cultural resources, aesthetics, economic, social or human health and safety. Effects can be direct, indirect, or cumulative. Used interchangeably with “impact.”

enabling legislation - the legislation that establishes national parks and that can be modified by subsequent legislation. Enabling legislation often describes the park purpose- the special attributes that caused the areas to be set aside with the mandate to protect these resources in an unimpaired condition for future generations.

endangered species - any species that is in danger of extinction throughout all or a significant portion of its range.

endemic – species having a distribution that is restricted to a relatively small region.

ephemeral – (as in ephemeral stream): not holding surface water most of the year.

extinct – a taxon having no living representative (i.e., died out).

extirpated species - a species that is no longer present in an area where it once lived. This could be the result of several environmental factors, including human activities.

Final Environmental Impact Statement (FEIS) - the document that responds to public comments on the draft environmental impact statement and may include corrections and revisions as a result of public comment.

floodplain - a flat region in the bottom of a valley that is, or historically was, influenced by river flooding.

frontcountry - areas that are easily accessible to visitors (as opposed to backcountry or wilderness) and that are more highly used, often by single-day visitors to the parks. The frontcountry contains developed park areas and is generally along or accessed by transportation corridors.

general management plan - a legislatively required plan that usually guides park management for 15-20 years. It is accompanied by a draft and final environmental impact statement.

genetic barcode - also known as a DNA barcode – the usage of a genetic marker (i.e. gene or DNA sequence) in an organism’s DNA to identify it as belonging to a particular taxonomic (species) group.

genetic clade – a sub-group of organisms from among a larger group sharing common ancestry, not shared by the other organisms in the larger group.

global warming - refers to just one aspect of climate change - a rise in the surface temperature of the earth’s surface.

impact – (see effect)

introduction – in regards to nonnative species, the intentional or unintentional escape, release, dissemination, or placement of a species into an ecosystem as a result of human activity.

invasive species - a nonnative species whose introduction does or is likely to cause economic or environmental harm or harm to human health. Invasive species display rapid growth and spread, establish over large areas, and persist.

invertebrate – an animal lacking a backbone, such as an arthropod, mollusc, annelid, coelenterate, etc. The invertebrates constitute an artificial division of the animal kingdom, comprising 95% of animal species and about thirty different phyla.

invertebrate drift – when invertebrate larvae in streams are dislodged from substrates by a disturbance such as a flood or piscicide treatment and carried downstream by flows.

lentic - a nonflowing, standing or still body of fresh water, such as a lake or pond.

lotic - a flowing body of fresh water, such as a river or stream.

macroinvertebrate – any invertebrate that is large enough to be seen with the naked eye (with a body longer than 2 mm).

minimum requirement - a documented process used by the NPS to determine the appropriateness of all actions affecting wilderness.

minimum tool - a use or activity, determined to be necessary to accomplish an essential task, which makes use of the least intrusive tool, equipment, device, force, regulation, or practice that will achieve the wilderness management objective.

mitigation - measures that are taken to reduce the intensity of an adverse impact. Examples include alternative actions that would avoid the impact, that would minimize the impact by limiting the magnitude of the action, that would rectify the impact by repairing, rehabilitating, or restoring a resource, that would reduce impacts through preservation or maintenance; or that would compensate for the impact through replacement or substitution (e.g., creating a wetland environment at another location).

native species - with respect to a particular ecosystem, a species that, other than as a result of an introduction, historically occurred or currently occurs in that ecosystem.

National Environmental Policy Act of 1969 (NEPA) - this public law requires federal agencies to look at alternatives for proposed major federal actions and to fully analyze the impacts of those alternatives on the human environment before a decision is made.

nonnative species - with respect to a particular ecosystem, any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem.

packstock – (see stock)

piscicide - a substance that is toxic to fish, and specifically defined as a pesticide whose intended function is to eliminate undesirable fish from a body of water. Rotenone and antimycin A are commonly used piscicides.

piscicidal concentration – (see application concentration)

plankton – minute pelagic organisms that drift or float passively with the current in a sea or lake, consisting chiefly of diatoms, protozoans, small crustaceans, and the eggs and larval stages of larger animals.

physical tools – tools used to physically eradicate fish from treatment areas, including gill nets, electrofishers and dipnets, shovels and boots to disturb redds, and blasting to change cascades into vertical waterfalls that can serve as fish barriers.

potassium permanganate - a dark purple salt (KMnO₄) used as an oxidizer and disinfectant. It is commonly used in fishery management to neutralize piscicides such as rotenone.

public involvement - public input sought in planning for public lands and required under the National Environmental Policy Act. Comment is sought at the initial scoping and at the DEIS stages. Substantive comment on the DEIS must be responded to in the FEIS.

Record of Decision (ROD) – a document that states the official decision for alternative actions proposed by agencies in a draft environmental impact statement and revised in a final environmental impact statement.

reintroduction – the renewed introduction of a species to an area from which it has almost or completely disappeared within historical times.

rotenone - rotenone is a selective, non-specific pesticide, primarily used to control insects and invasive fish species, with some acaricidal (i.e., lethal to some arachnids) properties. Rotenone is used in home gardens for insect control, for lice and tick control on pets, and for fish eradications as part of water body management. The use of the rotenone for control of fish and in cranberries is restricted by the Environmental Protection Agency.

Rotenone is a rotenoid plant extract, obtained from such species as barbasco, cub, haiari, nekoe, and timbo. These plants are members of the pea (Fabaceae) family. Rotenone containing extracts are taken from the roots, seeds, and leaves of the various plants.

rotenolone – a primary decomposition product of rotenone, which possesses about half the toxicity of rotenone.

redd – a hollow in gravel, sand or woody debris on stream and lake bottoms, scooped out and cleaned by spawning trout, salmon, or other fish as a place to deposit eggs (i.e., a fish egg nest).

self-sustaining - for this plan/EIS, refers to reproducing fish that are able to maintain populations over time without further stocking.

special-status species - a species, subspecies or distinct vertebrate population segment that has been added to the federal lists of endangered and threatened wildlife and plants as they appear in section 17 of Title 50 of the Code of Federal Regulations (50CFR 17.11 and 17.12).

species - a group of organisms all of which have a high degree of physical and genetic similarity, generally interbreed only among themselves, and show persistent differences from members of allied groups of organisms.

species composition - the types and number of species that occupy a particular area.

stock - animals such as horses, mules, donkeys, or llamas that can be ridden or used to carry supplies.

substrate - the surface or material on or from which an organism lives, grows, or obtains its nourishment.

sustainable - the use of park resources and environments in a way that does not deplete or permanently damage them, thereby allowing the uses to continue for an extended time.

taxa (plural of “taxon”) – a taxonomic group of any rank, such as a species, family, or class.

taxa richness (a.k.a., biodiversity) – The number of taxa present in a community, measured as the number of taxa in a given area.

threatened species - any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

refugia - a geographical region that has remained or will remain unaltered by a disturbance that is affecting surrounding regions, therefore forming a refuge for relict plants and animals.

trophic cascade - influence of consumer organisms on those lower in the food web with alternating effects at each trophic level; a.k.a., top-down control.

vascular - plants that have sap-carrying vessels (similar to blood vessels).

vertebrate - an animal of a large group distinguished by the possession of a backbone or spinal column, including mammals, birds, reptiles, amphibians, and fishes.

vision - a broad philosophical statement that describes what the parks should be with regard to future resource conditions and human experiences.

wilderness - an area set aside by Congress as part of the wilderness preservation system. The intent is to protect lands in their primitive condition with little impact by man. These are unroaded areas where no development is permitted, and certain uses, such as motor vehicles, motorized equipment or motorboats, landing of aircraft, any form of mechanical transport, and landing of aircraft, are prohibited.

wilderness character – essential features of every wilderness, regardless of size, location, agency administration, or any other attribute. These characteristics require that wilderness be *natural* (ecological systems are substantially free from the effects of modern civilization), provide *solitude* (there are outstanding opportunities for solitude or other primitive and unconfined recreation), be *undeveloped* (retain its primeval character and influence, and is essentially without permanent improvement or modern human occupation), and *untrammeled* (essentially unhindered and free from the actions of modern human control or manipulation). Some specific sites within wilderness areas may have their character defined by special ecological, geological, or other features of scientific, educational, scenic, or historical value.

zooplankton - microscopic or barely visible animal that eat algae (the animal form of plankton). Freshwater zooplankton found in high mountain lakes would include microscopic animals such as protozoans, rotifers, copepods, and cladocerans. Zooplankton are an important component of the lake food web and ecosystem, and are a primary food source for many organisms.

zoospores - a motile, unicellular, flagellate spore. Zoospores can be created by algae, bacteria, and fungi (e.g., chytrid zoospores).