

CALIFORNIA COASTKEEPER ALLIANCE

RIPARIAN PRINCIPLES

FOR CLIMATE-RESILIENT WATERSHEDS



Watersheds play a key role in community and ecosystem health. However, California's interconnected watersheds are threatened by over-allocation and diversions from rivers and streams, uncontrolled development, and increased stressors driven by climate change. California Coastkeeper Alliance (CCKA) has developed ten Riparian Principles to increase the climate resiliency of California's watersheds by promoting and restoring the natural functions of our rivers and streams. Together, these principles will sustain healthy watersheds for people and nature now – and for generations to come.

Principle **1** [Address flow impairments to promote healthy rivers and ecosystems for both humans and nature.](#) Protect water flows necessary to support riparian species, endangered fish, and all beneficial uses.

Principle **2** [Allow rivers to meander by protecting floodplains.](#) Promote decisions and practices that support natural riparian ecosystem and hydrologic functions. Increase restoration to improve aquatic ecosystem resilience and protect California communities from flooding.

Principle **3** [Prohibit livestock grazing in California waterways and within riparian buffer zones.](#) Explicitly prohibit livestock access to riparian zones to protect water quality and decrease streambank erosion.

Principle **4** [Promote the biological function of California's rivers and streams.](#) Restore the natural timing and function of rivers and streams, such as fish migration, sediment transport, and repression of toxic algal blooms, to increase the resilience of California's water systems.

Principle 5 **Reduce nutrient inputs to protect water quality for riparian ecosystems.** Manage and reform the use of nutrients to improve the health of California's waterways and prevent toxic algal blooms.

Principle 6 **Promote healthy soils to improve water quality.** Restore healthy, high-functioning soils as a critical tool to conserve water and limit sediment transport into waterways.

Principle 7 **Protect California's headwaters and historic salmon-bearing streams through improved timber harvesting management and forest restoration.** Prioritize forest health and improved timber management to protect California's most vulnerable watersheds.

Principle 8 **Deter illegal cannabis cultivation.** Enforce unregulated cannabis to ensure all cannabis operations are protective of water quality and not illegally diverting flows.

Principle 9 **Enforce existing water rights to protect public trust resources.** Fulfill public trust duties to protect fisheries and other public trust resources by prioritizing enforcement against illegal water diversions and groundwater extractions that impact public trust resources.

Principle 10 **Decrease water demand to improve flow in California's rivers.** Pursue water conservation and efficiency measures, water recycling, and stormwater capture as cost-effective and environmentally-sound sources of local water supply.

Principle 1 Address Flow Impairments to Promote Healthy Rivers and Ecosystems for Both Humans and Nature

Riparian ecosystems provide critical links and connections between aquatic and terrestrial habitats that support a wide range of wildlife. The resilience of these ecosystems, however, is threatened by ongoing human-caused stressors, such as the over-diversion, modification, and pollution of California's rivers and watersheds. The timing, quality, and function of flows must be protected and restored to enhance the resilience of riparian ecosystems – and the survival of the species they support – to climate change.

Throughout California, threatened and endangered fish struggle to survive in rivers that are over-diverted, dammed, and otherwise modified. Dams have blocked access to spawning grounds, reservoir operations have altered river flows, land and resource development has degraded essential habitat, and diversions for water supply have severely reduced the volume of water flowing in many California rivers. The overarching threat of climate change only intensifies the challenges these species face by decreasing streamflow, increasing water temperature, and shifting habitat. Even prior to the multi-year drought from 2012 to 2015, surface water diversions and excessive groundwater pumping left many California streams and rivers completely dry during summer months, or with water levels inadequate to sustain fish, wildlife, and recreation. Salmon and other anadromous fish like trout struggle to reach their spawning grounds in the Klamath River, Russian River, Yuba River, Ventura River, and numerous other rivers throughout California. Meanwhile, low flows exacerbate the presence of harmful algal blooms and conditions that make our rivers uninhabitable for native fish and wildlife.

California's failure to recognize and protect water flows through its water rights permit process and management of dams has resulted in the demise of endangered salmonid species such as Coho and Chinook salmon and steelhead trout while threatening drinking water supplies. As climate change further exacerbates these problems, California must act to protect its rivers from impaired flow and ensure resilient river ecosystems, during both wet years and periods of drought, to ensure the long-term resilience of these ecosystems for both humans and nature.

Principle 1 ACTIONS

- The State Water Board must retain its authority to issue 401 water quality certifications for federal dam relicensing projects to protect the quality and timing of river flows, despite current legal barriers.
- The State Water Board must issue 401 water quality certifications that use the best available science and modeling, in consultation with the National Marine Fisheries Service and California Department of Fish and Wildlife, to ensure certifications are protective of flows and wildlife while concurrent environmental analysis is completed.

- California should prioritize the removal of outdated and uneconomic dams to increase the resilience of riparian ecosystems and survival of native aquatic species by requiring the California Department of Fish and Wildlife to develop and maintain a list of dam removal projects with quantifiable milestones to remove priority dams by 2030, 2040, and 2050.
- The California Department of Fish and Wildlife must update its flow criteria to account for interconnected surface and groundwater.
- The California Department of Fish and Wildlife and State Water Board must develop and maintain an “endangered” rivers list of those impaired by low flows based on the Department’s functional flow criteria. The State Water Board must develop final flow objectives for “endangered” rivers consistent with the functional flow criteria, the public trust doctrine, clean water laws, endangered species protections, the prevention of the waste and unreasonable use of water, and all agricultural regulatory programs.
- The State Water Board should reassess water rights for rivers impaired by low flow, specifically considering waste, unreasonable use, and the protection of public trust; and set interim flow objectives within 4 years of creating the “endangered” rivers list.
- The State Water Board must take a watershed-wide approach when considering new diversion permits or water use change petitions to ensure that diversions do not exceed the flow capacity needed to support both humans and wildlife.
- The State Water Board should prioritize the completion of technical studies to inform wastewater change petitions and ensure flow objectives for effluent-dominated rivers and streams are protective of ecological health.
- California must prioritize funding for the State Water Board and Department of Water Resources to identify interconnected surface water and groundwater aquifers to improve water management, and to enforce against groundwater withdrawals that adversely impact surface water flow.
- California state agencies should require appropriate fish passage for all California dams, roads, and highways impacting historic salmon-bearing rivers and streams to reconnect spawning habitat with river systems.

Principle 2

Allow Rivers to Meander by Protecting Floodplains

Reduced snowpack, longer droughts, and stronger storms – exacerbated by climate change – are already impacting California’s communities, economy, and aquatic ecosystems. As atmospheric rivers become more frequent, and warmer storms bring more precipitation that falls as rain rather than snow in California’s mountain ranges, the resulting snowmelt and sheet flow will force water managers to release more water from dams during storm events, or otherwise cause flooding downstream. California is particularly susceptible to rapid shifts between drought and flood, as the state has witnessed rapid and dramatic transitions from a multi-year drought (2012-2016) to extreme wet years (2017 and again in 2019). Climate change will only exacerbate the oscillating wet and dry years experienced in California. Unfortunately, the state has lost over 80 percent of its riparian areas, leaving individual communities vulnerable to severe flooding during periods of extreme precipitation.

The state must promote decisions and practices that allow natural riparian ecosystem and hydrologic functions to be restored, which in turn will increase the resilience of California’s riparian ecosystems to climate change and protect California communities from flooding. Many of California’s historic floodplains, however, are now the state’s most urbanized or otherwise developed areas, with underserved or environmental justice communities living in these historic floodplains at greater risk of flooding. Strategically imposing riparian buffer zones and moving back levees and other barriers to natural floodplains will allow rivers to meander and expand safely during extreme wet periods without inundating these communities, while increasing habitat needed for birds, animals, and fish. Finally, protecting and restoring floodplains will increase groundwater recharge, protect communities from flooding, preserve water quality by filtering polluted runoff, and improve the resilience of California’s water supplies overall.

Principle 2 ACTIONS

- California should establish a consistent “riparian buffer” definition for all state and local agencies to integrate into their permits and decision-making processes to protect riparian zones from development and pesticide use.
- California must require mandatory riparian buffer zones in local land use plans, zoning ordinances, and variances for community and agricultural development to prevent encroachment of riparian systems with a width based on the best available science for that region. These riparian buffer zone requirements should be reevaluated with the update of a city or county’s General Plan to reflect projected buffer needs due to climate change.
- California must require a minimum 25-foot buffer for roads along riparian corridors that prohibit vehicle traffic and livestock access to increase native grasses and trees for soil stabilization.

- California should require cities and counties to designate riparian buffer zones and flood-compatible land uses in General Plan updates and identify priority areas and projects to increase these buffer zones.
- California should provide property tax breaks and other financial incentives for individual property owners that designate riparian buffer zones and flood-compatible land uses on their property to control excess flow and build detention ponds and swales to manage flood waters, filter pollutants, and increase groundwater recharge.
- The State Water Board must complete a Stream Protection Policy focused on riparian habitat as a follow up to the Wetlands Policy.
- California must adopt a statewide policy of annual net gain of ecologically functioning riparian and wetland habitat to mitigate for a century of net loss of these critical habitats.
- California must prioritize funding for high resolution, aerial mapping and imaging tools of state wetlands and riparian zones to track the efficacy of wetland management and restoration programs, and relevant permits.
- California must annually monitor and publicly publish the status, including acreage, of ecologically functional wetlands throughout the state.

Principle 3 Prohibit Livestock Grazing in California Waterways and Within Riparian Buffer Zones

As climate change threatens the quality and quantity of flow in California's rivers, California must prevent the introduction of unnecessary pollutants like manure, bacteria, nutrients, and sedimentation caused by the unfettered access of livestock to California's rivers and streams. Improper livestock grazing poses a serious threat to water quality through the direct discharge of contaminants and erosion of streambanks and can wreak ecological havoc on sensitive ecosystems by destroying vegetation, damaging wildlife habit, and disrupting natural processes. One hundred and twenty California waterways are impaired specifically due to grazing activities that impact riparian zones, with many lush streams and riparian forests throughout California reduced to flat, dry wastelands devoid of native vegetation due to the degradation of once-rich topsoil.

The primary impacts of grazing are caused by the unmanaged presence of livestock in waterways and riparian areas. When livestock are allowed direct access to a stream or river, their waste can increase the concentration of nutrients and bacteria, as well as other pathogens like viruses and fungi. When concentrated in riparian areas, grazing livestock can remove the vegetation needed to retain stream bank stability and degrade soils. In turn, this increases stream temperature due to

the lack of shade and increases erosion, leading to wider and shallower streams. Overgrazing and the compaction of soils by livestock also decreases infiltration rates, deteriorates soil structure, and decreases organic cover material. These impacts can modify the entire hydrologic regime and functions of our waterways with cascading effects on aquatic life, and coupled with low flow, exacerbate the presence of harmful algal blooms.

Principle 3 ACTIONS

- California should require enforceable standards under the Public Resources Code for development and other land uses, such as agriculture and livestock grazing, adjacent to creeks and watercourses to protect riparian habitat and to prevent waterway modification or vegetation removal that increases sedimentation or runoff.
- The State Water Board must explicitly prohibit livestock access to riparian zones, ponds or lake shores, wetlands, and streambanks using exclusionary fencing in all applicable permits and guidance documents. At a minimum, livestock should be prohibited from access to waterways that are a source of drinking water.
- The State Water Board must require sufficient riparian buffers based on the best available science and informed by the individual features of the streambank to limit direct animal access to waterways and to the riparian zone in all relevant policies and permits.
- The State Water Board should require riparian grazing management practices that include, but are not limited to, exclusion fencing, animal trails and walkways through or around sensitive areas, and stabilized stream crossings.
- The State Water Board should update and publish its Grazing Best Management Practices to prevent livestock from accessing riparian zones with practical guidance, such as encouraging ranchers to construct artificial shade areas far from riparian zones to encourage use of upland sites by livestock, particularly in hot locations.
- The State Water Board, through its Grazing Best Management Practices guidance document and Regional Board permits, should encourage ranchers to adjust the intensity and duration of grazing based on the actual availability of forage to protect soils from erosion.
- The State and Regional Water Boards should incorporate the principles and practices outlined in the Grazing Best Management Practices guidance document, including adaptive monitoring, into all applicable permit and programs.
- The State Water Board should require creek-adjacent Concentrated Animal Feeding Operations (CAFOs) to include sufficient riparian buffers to protect riparian vegetation and incorporate applicable Grazing Best Management Practices to prevent unnecessary erosion.

Principle 4 Promote the Biological Function of California's Rivers and Streams

California's highly engineered water system has allowed communities to develop in traditionally arid areas, though at a cost. Much of the riparian areas adjacent to California's rivers and streams have been destroyed to make more room for communities and urban areas, as well as crops and livestock. Past and present land use activities and the manipulation of California's natural water systems are spelling disaster not only for the health of aquatic ecosystems, but for our communities as water quality is degraded.

In their natural state, rivers form a series of complex channels entangled with rocks and plant material transported in stream flow from upstream portions of the watershed. The quantity and quality of the water that flows in streams and rivers are the product of not only human alterations, but also the climate, topography, geology, and vegetative characteristics of that watershed. California must adopt policies and regulations that address the biological and ecological impacts of hydromodification of rivers, including channelization and concretization, and prioritize funding for the daylighting and deconcretization of such rivers. California must take proactive actions to manage the timing of water diversions to restore the natural timing and function of California's river ecosystems, such as fish migration, sediment transport, and repression of toxic algal blooms to increase the overall health and function of California's watersheds now and as conditions change due to climate change.

Principle 4 ACTIONS

- The State Water Board must develop a statewide Biostimulatory and Biointegrity Policy that combines chemical and biological indicators to better understand the health of California's waterways, and to set numeric standards for watershed health factors such as flow, temperature, and nutrients.
- California must improve the timing of river and stream diversions to promote natural ecosystem processes, such as fish migration and sediment transport, and to reduce the occurrence of toxic algal blooms.
- California should invest in projects that address and rectify the biological and ecological impacts of hydromodification, including channelization and concretization of rivers.
- California should prioritize state funding to promote projects that 'daylight' rivers and remove concrete from rivers and streambanks to increase native vegetation and in turn increase shade to lower water temperatures and promote aquatic habitat.
- California should protect undisturbed sediments and mud in wetland and riparian areas through enforceable requirements in streambed alteration agreements, agricultural orders, and water quality permits, and prohibit the harmful practices of suction dredge mining.

Principle 5 Reduce Nutrient Inputs to Protect Water Quality for Riparian Ecosystems

With shifting precipitation patterns due to climate change, the water quality of California's rivers and streams could decline as heavy storm events increase the amount of polluted runoff from our cities and fields and the concentration of pollutants increase when flows dwindle during times of drought. Nutrient pollution and eutrophication are already pressing challenges to water quality in California, with agriculture as the largest source of California's nitrogen input. The over- or improper application of fertilizers onto agricultural fields can cause excess nutrients (i.e., phosphorous and nitrogen) to be lost to the environment through runoff, erosion, leaching, or volatilization. Fruit and vegetable crops only uptake approximately half of the nitrogen applied, while only a quarter of the nitrogen used for livestock feed converts to consumable meat or dairy products. Once in a waterway, these nutrients can lead to an excess growth of aquatic plants, including toxic algae and submerged weeds, which can impair beneficial uses, including drinking water and recreation.

Growers typically apply large amounts of untreated animal manure produced by their operations onto adjacent croplands. However, growers often apply waste in far excess of the amounts needed to fertilize crops and, as a result, much of that waste is mobilized via runoff into nearby waterways. The large amounts of animal waste produced by concentrated livestock has the potential to contribute nutrients, suspended solids, pathogens, and heavy metals to surface and groundwater supplies. Proper nutrient management, however, encourages the natural process of nutrient cycling which in turn optimizes crop growth, limits costs for growers, and minimizes the environmental impacts of nutrient pollution. California must manage and reform the use of nutrient inputs to improve the health of all 'waters of the state' in California, prevent nutrient pollution from continuing to degrade California's waterways, and ultimately increase the resilience and quality of California's rivers and streams in light of new stressors caused by climate change.

Principle 5 ACTIONS

- California should provide resources for the State Water Board to develop a numeric water quality standard for nutrients that is protective of aquatic health.
- The State Water Board must ensure Agricultural Orders and Basin Plan Amendments are protective of water quality standards and objectives, and properly implement California's Non-Point Source and Antidegradation policies.
- The State and Regional Water Boards should set enforceable groundwater nutrient loading performance standards based on accurate, up-to-date models for different ecosystems and basins.
- The State Water Board should strengthen surface water monitoring requirements by adopting, implementing, and enforcing appropriate nitrate and phosphorous standards, as well as ensuring all monitoring results are publicly available.

- The State Water Board should set nutrient application and removal (A/R) ratios based on field trials and testing data from operating farms as an enforceable standard based on the best available science for high nitrogen risk crops to prevent groundwater degradation and eutrophication of rivers and streams.
- California should require vegetation buffers alongside agricultural fields, particularly down slope of individual sites, to filter chemicals and pesticides from agricultural runoff.
- The State Water Board's Compost Order and applicable water quality permits should require compost piles be covered with an impermeable surface prior to rain events to prevent runoff.
- The State Water Board must prioritize the development of a statewide non-dairy CAFO permit to regulate and prevent often overlooked sources of nitrogen pollution from reaching California's waterways.
- The State Water Board must ensure CAFOs are consistently regulated to protect California's waterways, including limits on herd size, sufficient up- and down-stream monitoring to identify sources of nitrates, and the lining of all manure lagoons to retain nutrients onsite.
- The State Water Board should establish clear guidelines for the siting of new facilities or expansions that require CAFOs be located away from surface waters, areas with high potential for infiltration of contaminants into groundwater supplies, and critical or sensitive ecosystems.
- The State Water Board should identify all CAFOs statewide, update the list annually, and ensure all CAFOs of a specific size and threat to water quality are enrolled in proper the Waste Discharge Requirement (WDR) or National Pollutant Discharge Elimination System (NPDES) permit.
- The State Water Board should impose a moratorium on construction for the expansion of CAFOs absent implementation of best management practices.

Principle 6 Promote Healthy Soils to Improve Water Quality

Increasing California's resilience to climate change starts on the ground. Healthy, high-functioning soils store more water to make our soils and ecosystems more resilient during dry years, exhibit higher rates of water infiltration, retain more water and improve water quality by reducing runoff from agricultural lands, and are a critical tool in absorbing water during flood events. More water infiltration means less winter runoff, less soil erosion, and less sediment flow into our streams and rivers. The improved capacity of soils to receive and store water also increases the summer base flow in streams, which is important to dilute pollutants, decrease stream temperatures, and increase dissolved oxygen in the water column. Healthy soils tighten nutrient cycles for nitrogen, phosphorus, and sulfur, creating highly functional upland ecosystems while preventing stream eutrophication that deprive aquatic life of oxygen. Healthy soils also retain and break down pesticides, heavy metals, and other pollutants, preventing non-point source pollution from reaching aquifers and waterways. Finally, healthy soils also capture carbon and funnel less dust into the air, which helps rural communities breathe easier. Low impact development and proper construction practices can promote soil health, even in urban areas, to improve water quality and retention, and overall climate resilience, across California.

Principle 6 ACTIONS

- California should reward the adoption of best management practices for soil health, such as no-till agricultural practices, cover crops, and other crop residue management approaches through buyer contract preferences or agricultural tax incentives, in addition to the California Healthy Soils Program.
- California should require cover cropping from October to May in all agricultural policies and permits to maximize crop residue, boost soil fertility, and increase water retention during storm events.
- California should prioritize funding for education and incentive programs that allow property owners and residents to understand and test their soil to inform agricultural best practices that reduce the use of additives, increase the use of compost or other biologic catalysts to increase nutrient uptake, support carbon sequestration, decrease greenhouse gas emissions from tractor use, increase water-holding capacity, and improve crop yields.
- California should prioritize providing research, education, and technical support for growers to promote healthy soils, including funding academic research on healthy soil practices and developing a user-friendly and publicly accessible soil management database.

- California must improve education and awareness of government cost-sharing programs for implementing soil health best management practices to reduce the financial barriers of implementation and limit up-front costs for growers.
- All California stormwater permits should require low impact development (LID) – capturing at least an 85th percentile storm event – in new building and street designs to preserve and recreate natural landscape features, such as increasing pervious spaces, to retain stormwater runoff in soils and prevent harmful runoff into California’s creeks, rivers, and coast.
- The State Water Board should incorporate the principles of the California Healthy Soils Initiative in an update to the statewide Construction General Permit to protect organic matter, biological diversity, and vegetation by preserving native topsoil.

Principle 7

Protect California’s Headwaters and Historic Salmon-Bearing Streams through Improved Timber Harvesting Management and Forest Restoration

Water supplies stored in high-elevation forests are particularly vulnerable to climate change and with precipitation patterns projected to reduce snowpack and increase the frequency and intensity of wildfires. Roughly one-third of California is forested, while much of the state is composed of chaparral or woodland ecosystems, which are home to the upper watersheds that are the originating water source for millions of people across the state. These forests and woodlands provide critical air, wildlife, climate, and recreational benefits to California communities and visitors. However, poor conditions across these forests and watersheds, including excessive vegetation density and an overabundance of small trees and brush, have contributed to more prevalent and catastrophic wildfires with unprecedented tree mortality and loss of life and property. Healthy forests are needed to protect and enhance our water supplies downstream and prevent the occurrence of catastrophic wildfire.

California’s upper watersheds face significant threat due to increased risk of high-severity wildfires that are exacerbated by outdated land management practices, such as fire suppression and overgrowth. Naturally-occurring and low-intensity wildfire have long been suppressed, leading to overgrowth of California’s forests and chaparral areas with young trees, ladder fuels, and an unnatural mix of vegetation species so that when wildfires do occur, they are uncharacteristically hot with catastrophic consequences. With increased stressors posed by climate change, including increased drought and higher temperatures, severe and catastrophic wildfires directly endanger California’s water security and its communities. Improved forest management that protects mature forests with multi-age class trees will provide multiple benefits to society. By increasing the natural

function of forest ecosystems and alpine meadows, these ecosystems can support highly diverse species, sequester carbon, improve soil health, decrease reservoir sedimentation, and improve the overall health of the state's headwater streams. Diverse partnerships are needed to increase the success and scale of forest and watershed health projects, and to decrease the state's risk of catastrophic wildfire in its most vulnerable watersheds.

Further, despite the valuable cultural, economic, and environmental services California's native fish species provide to California streams and rivers, these species have long struggled against poor water and forest management. The science is clear that a number of timber harvesting practices – such as logging on muddy slopes during wet weather – have contributed to the sedimentation of streams throughout California. Virtually all major fish-bearing watercourses on the North Coast and countless rivers and streams throughout the state are impaired for sediment, which can prevent successful spawning and impair the health of salmon and other valuable fish species. Meanwhile, legacy pollution from historic hydraulic mining in the Sierra Nevada continue to leach mercury, arsenic, acid mine drainage, and other contaminated sediments into California's waters, threatening native fish species, entire ecosystems, and public health. California must prioritize forest health and improved timber management to protect its upper watersheds and headwater streams that California's native fish, communities, and entire water system rely on.

Principle 7 ACTIONS

- California must recognize the statewide benefits of forest health by funding multi-benefit forest and watershed restoration projects – including but not limited to ecologically-based thinning and controlled burning – and supporting regional coordination between state and federal agencies, watershed coordinator programs, resource conservation districts, nongovernmental organizations, and local entities to create a model that can increase the pace and scale of forest and watershed restoration, and reduce the threat of catastrophic wildfire, throughout the state.
- California should ensure the incorporation of local tribal ecological knowledge (TEK) into forest management projects and plans to promote healthy management practices and overall watershed health.
- California must monitor the impacts of phosphate-based fire retardant, and fund research to advance and implement non-phosphate-based fire retardants to combat wildfire.
- The Regional Water Boards must issue and update existing Waste Discharge Requirements (WDRs) with appropriate controls for sediment and temperature, including Basin Plan non-point source requirements, to achieve water quality objectives and to protect aquatic beneficial uses.
- California must require timber harvesting lands containing or adjacent to watercourses bearing listed anadromous salmonids that are impaired by sediment to have an appropriate erosion control plan that complies with section 13242 of the Water Code and non-point source requirements to protect water quality.

- California should prohibit timber harvesting activities that have an extreme erosion hazard rating, unless the timber harvesting plan must ensure all active or potential sites for sediment delivery be accounted for and controlled, and must be approved by a certified and licensed engineering geologist and reviewed by the appropriate Regional Water Quality Control Board.
- California should ensure forest practice rules include the protection and restoration of riparian zones in watersheds with listed anadromous salmonid species in order to support fish populations at all life history stages and to control pollutants known to negatively impact the survival of fish species.
- California must ensure erosion control plans for timber harvesting include specific methods to avoid significant sediment discharge into watercourses from timber operations, such as disclosing active and potential erosion sites from roads, skid trails, stream crossings, or any other structures or sites that have the potential to discharge sediment attributable to timber operations into waters of the state that adversely impact fish species.
- California state agencies must plan and implement active fish habitat restoration projects, such as the removal of obstacles to fish passage, maintaining habitat conditions to support all life stages of salmonids, and pollutant controls in watersheds impacted by the historic effects of hydraulic mining.

Principle 8

Deter Illegal Cannabis Cultivation

New and emerging regulated water use in California places additional strain on rivers and streams and can cause water quality problems if poorly managed. These new water uses, such as legal cannabis cultivation, add another layer of complexity to California's already over-burdened water rights system as the state attempts to meet both human and ecological needs while it prepares for climate change.

Illegal and unregulated cannabis cultivation in California drains streams and tributaries during dry summer months, degrades public lands, pollutes waterways with rodenticide and other illicit chemicals, and damages streambanks without proper erosion control. Fortunately, new statewide requirements issued by the California Department of Agriculture and the State Water Resources Control Board require licensees to hold valid water rights or apply for surface water rights that only allow cultivators to divert and store water during the winter months, and thereby reduce diversions that compete with salmon and other fish species during dry summer months. Critically, cannabis regulations in California are among the most stringent statewide and are far more stringent and

protective of water quality than historical agricultural permits. Due to protections afforded by these requirements, California must support those who lawfully cultivate cannabis by providing best practices that guide low-impact cultivation and assist growers in achieving these environmental safeguards.

The success of California's statewide requirements and improved cultivation practices to protect water resources, however, is largely dependent on cannabis cultivators entering the regulated sector. Unfortunately, since licenses were issued for cultivation and business retail in 2018, the number of license applicants has plummeted, and cannabis products have surged back into the unregulated market. The continued presence of illegal cannabis saturates the market and competes with those complying with California's stringent environmental regulations – resulting in lowered product value and a higher profit margin for those operating outside the legal market. In turn, unregulated cannabis floods the market that is potentially dangerous to consumers, easier to move across state lines, and more likely to degrade our environment and rivers.

Principle 8 ACTIONS

- California must reduce the proliferation of unregulated cannabis by reducing regulatory and financial burdens to increase legal and environmentally compliant cannabis cultivation.
- California should encourage enrollment in California's commercial cannabis license program by requiring all counties to allow legal cannabis cultivation within their jurisdiction.
- California must reduce the impacts caused by cannabis cultivation in historic salmon-bearing watersheds by appropriately managing the timing of water diversions or groundwater pumping and preventing the overuse of fertilizers or other chemicals to preserve water quality.
- California should publish best practices for both outdoor and indoor cannabis cultivation to prevent environmental degradation, such as clear-cutting areas for outdoor cultivation and limiting the use of pesticides, and to protect water quality.
- California should increase outreach conducted by Regional Water Boards and local Resource Conservation Districts to educate legal cannabis permittees of their water rights and best management practices to protect water quality and achieve compliance with the Cannabis Policy.
- California should prioritize funding, rather than establish new cannabis taxes, to the State Water Board to strengthen its enforcement of illegal cannabis cultivation, including the use of high-resolution satellite imagery to identify illegal grows.

Principle 9 Enforce Existing Water Rights to Protect Public Trust Resources

Water belongs to all people now and for future generations. Under both the U.S. and California Constitution, the public trust doctrine mandates that water be available to support public needs and that natural resources be protected for the benefit of the public – this includes a right to the overall health of our watersheds to support fish, wildlife, and rivers to enjoy. Mismanagement, including over-appropriation and over-diversion of our rivers and streams, undermines the economic stability and well-being of California’s communities and environment by leaving rivers dry or without adequate flow to sustain wildlife. Climate change only threatens the future viability river flows and the life these flows sustain. Fish, such as native salmon, are already facing rapid population declines and quality flows must be protected to increase the chance of survival for keystone species in our watersheds. California, through the State Water Board, is responsible for the protection of specific resources and beneficial uses of our waters, such as fisheries, wildlife, aesthetics, and navigation, that are held in trust for the public. The State Water Board must consider these responsibilities when planning and allocating water resources, and protect public trust uses whenever feasible. Given the State Water Board’s affirmative duty to take public trust resources, including fisheries, into account in its allocation of water resources, California should prioritize enforcement cases for water diversions that impact public trust resources.

Principle 9 ACTIONS

- The State Water Board must enforce an instream flow standard, and evaluate the individual and cumulative effects of illegal water diversions on the instream flow needed for fish spawning, migration, and rearing, and the flows needed to maintain natural flow variability when conducting water rights enforcement actions.
- California’s state agencies should invest in coordinated high-resolution areal imaging, data visualization, and data access to improve water rights enforcement, identify illegal diversions, water storage, other impacts to surface water availability, and track changes in riparian and wetland areas.
- The State Water Board and Department of Water Resources should maintain a public-facing clearinghouse of surface water flow and water diversions in real time, as well as historical water use.
- The State Water Board must improve its electronic management of water rights information (eWRIMS) to adequately inform water rights holders and the public of water rights changes and the status of pending petitions.

- The State Water Board must prioritize timely enforcement of water rights and actual penalties for violations based on the harm imposed on the environment, other water rights holders, and the individual economic status of the violating party to achieve actual deterrence.
- The State Water Board must prioritize enforcement of illegal diversions that adversely impact public trust resources.
- The State Water Board should increase funding streams for the Division of Water Rights to improve the processing of water rights applications and to conduct reliable, consistent enforcement statewide.

Principle 10 Decrease Water Demand to Improve Flow in California's Rivers

Water conservation must become a way of life for everyone in California. Much has changed in the past half century, and our technology, values, and awareness of how we use water have helped integrate conservation into our daily lives. There is more that can be done, and all Californians must embrace this effort to help us prepare for an uncertain water future due to climate change.

In 2009, the state adopted the Water Conservation Act through the passage of Senate Bill X7-7 requiring that we achieve a 20 percent reduction in urban per capita water use by December 31, 2020, promoting expanded development of sustainable water supplies at the regional level, and requiring agricultural water management plans and efficient water management practices for agricultural water suppliers. Conservation and efficiency are also keys to reducing the energy needed to pump, transport, treat, and deliver water – an important action included in the state's Climate Change Scoping Plan for reducing greenhouse gas emissions. On April 1, 2015, for the first time in state history, the Governor directed the State Water Board to implement mandatory water reductions in cities and towns across California to reduce water usage statewide by 25 percent, and in 2018, California adopted Assembly Bill 1668 and Senate Bill 606 to make water conservation 'a way of life.' We must continue to build from and implement these efforts to conserve water and promote innovative strategies to increase water conservation and ensure water conservation efforts are taken all year long – not only during drought years and over dry summers.

Meanwhile, there are environmentally sound, cost-effective water recycling and reuse options available to increase local water supply. For example, California's water has historically been treated solely as waste – used once, treated, and then disposed of directly into the ocean at tremendous environmental and economic cost. California also has a long history of managing

stormwater solely as a source of pollution and a flooding risk. Today's water recycling technology allows us to treat and reuse those wasteful discharges, which helps reduce energy consumption, increase water security, and meet California's constitutional obligations of preventing the waste and unreasonable use of water. California must support its cities and counties to make stormwater capture a growing portion of local water supplies and increase water recycling to promote more resilient local water supplies, and ultimately reduce the need to over-divert California's rivers and streams.

Principle 10 ACTIONS

- California must ensure statewide housing mandates, goals, and local General Plans align with available water supply, and where local supply is limited, incentivize the use of water recycling and efficiency.
- The State Water Board must mandate water conservation and efficiency measures before a Temporary Urgency Order reducing river flows is issued or approved in order to prevent a waste and unreasonable use of water – and to ultimately protect fish, recreation, and other beneficial uses.
- The State Water Board should create a State Revolving Fund specifically for water efficiency to provide local municipalities with legal and technical assistance to create tiered-based rate structures. Funding should also be awarded for leak detection and the implementation of water metering.
- The State Water Board should develop and publish technical and legal assistance to local jurisdictions to create tiered-based or income-based rate structures in compliance with Proposition 218.
- The State Water Board should require tiered rate structures in areas that fail to meet water quality standards to prevent dry-weather runoff and over-irrigation.
- The State Water Board and Department of Water Resource should identify and enforce water efficiency targets for all sectors, including but not limited to agricultural uses, recreational outdoor uses (e.g., golf courses), indoor municipal uses, industrial uses, and outdoor household uses (e.g., landscape watering), and establish metrics to determine compliance.
- California should require no flush urinals and water closets in all state and local government buildings.
- California must reform the state Constitution, specifically Proposition 218, to remove barriers for local jurisdictions to improve stormwater capture and reuse.
- The State Water Board should increase stormwater retention requirement to the 90th or 95th percentile, 24-hour rain event in all areas with demonstrated groundwater recharge potential.

- The Air Resources Board should complete the development of stormwater capture and use quantification methodology to demonstrate the benefits of stormwater capture and use for greenhouse gas reductions.
- The State Water Board must prevent the waste and unreasonable use of water by requiring wastewater that discharges directly into the ocean be recycled to the maximum extent practicable under existing and new discharge permits.
- California's state agencies should develop regulations, policies, and incentives for ocean wastewater dischargers to achieve California's existing statewide goal to recycle all ocean wastewater discharges.
- California should prioritize funding to the State Water Board to finalize raw water augmentation and Treated Drinking Water Augmentation regulations by 2023.
- The State Water Board must develop statewide regulations for the onsite treatment and reuse for non-potable end uses in multifamily residential, commercial, and mixed-use buildings (for example, flushing toilets or irrigation).
- California should replace all non-native turf grass on state-owned state properties with drought tolerant landscaping to conserve water and reduce greenhouse gas emissions from lawn maintenance.
- The State Water Board should delegate authority, ensure funding, and direct the Regional Water Boards to conduct reasonable use and waste analysis, and to impose permit limitations and compliance schedules to eliminate unreasonable use and waste by for publicly owned treatment works (POTWs).