

17 CUMULATIVE IMPACTS

17.1 INTRODUCTION

The Shoreline Plan is a long-range plan developed to manage the amount and intensity of recreational use and development along Lake Tahoe's shore in a manner that attains and maintains the environmental thresholds. Together, the Shoreline Plan works with the other elements of the Regional Plan and the Regional Transportation Plan (RTP) to regulate the total amount and type of development within the Lake Tahoe Region. Consequently, this planning framework inherently represents the cumulative condition within the Region. Because the Shoreline Plan considers the cumulative buildout of the shoreline, the analyses contained in Chapters 4 through 16 of this EIS are cumulative in nature. Similarly, the Regional Plan regulates the buildout of portions of the Region that are outside of the shoreline, and the EIS prepared for adoption of the Regional Plan evaluated the cumulative conditions of those portions of the Region. The analyses that have been carried out for the Regional Plan and the RTP, and their relationship to the Shoreline Plan, are discussed in brief, below.

17.1.1 Relationship to Other Programmatic Documents

The Regional Plan is a long-range plan that serves as the regulatory framework and blueprint for redevelopment and limited growth within the Tahoe Region. The Regional Plan consists of goals, policies, ordinances, and implementation measures to support achievement and maintenance of specific environmental standards – environmental threshold carrying capacities (thresholds). The Regional Plan limits the total amount of growth that can occur within the Tahoe Region, and establishes regulatory provisions, incentives, and project-review requirements necessary to attain and maintain the thresholds. See Chapter 4, "Land Use," for additional detail on how the Regional Plan regulates growth and development.

The 2017 RTP is a four-year plan to develop a transportation system in the Tahoe Region that offers strategies to support a healthy and prosperous community, economy, and environment and mitigates existing adverse mobility and environmental conditions. Strategies focus on travel modes, providing environmentally innovative infrastructure, creating incentives for distributing travel volumes, and prioritizing funding for specific projects to meet the RTP goals. The Sustainable Communities Strategy (SCS) is a combined land use and transportation plan to meet adopted goals for the reduction in greenhouse gas (GHG) emissions, in compliance with California's Senate Bill (SB) 375, Statutes of 2008. The contemporary concepts necessary to achieve the region's transportation vision were incorporated into the RTP, in conjunction with the SCS. These concepts include integration of land use planning and transportation; bringing work, shopping, recreation, housing, and lodging closer together; linking development better to a multi-modal transportation system; closing gaps in the existing bicycle and pedestrian network; enhancing transit service; and revitalizing communities through corridor enhancement projects that improve mobility for all travel modes.

In December 2012, prior to adoption of the Regional Plan Update (RPU) and RTP/SCS, a policy-level EIS was certified for the RPU, and in February 2017, a policy-level Initial Study/Mitigated Negative Declaration/Initial Environmental Checklist/Finding of No Significant Effect (IS/MND/IEC/FONSE) was certified for the 2017 RTP/SCS. Because of the policy-level nature of the RPU and its long timeframe, the EIS evaluated the environmental impacts of the RPU at a policy level and recognized the need for future project-level environmental review. In accordance with Section 15168 of the State CEQA Guidelines, a program EIR may be prepared on a series of actions that can be characterized as one large project and are related to, among other things, the issuance of general criteria to govern the conduct of a continuing program or individual activities carried out under the same authorizing statutory or regulatory authority and having generally similar environmental effects that can be mitigated in similar ways.

A program EIS provides regional consideration of cumulative effects and includes broad policy alternatives and program mitigation measures that are equally broad in scope.

The RPU EIS and 2017 RTP/SCS IS/MND/IEC/FONSE provide regional-scale analysis of the cumulative buildout and development of private and public lands within the Region, and they established a series of mitigation measures that reduce cumulative effects to a less than significant level. As described in Chapter 1, "Introduction," the TRPA environmental thresholds are the foundation for much of the decision making that occurs in the Tahoe Region. The environmental thresholds are used, in part, to guide preparation of findings, which are required prior to approval of certain actions. The cumulative analyses of the RPU EIS and RTP/SCS IS/MND/IEC/FONSE included assessment of: 1) programs that focus on environmental improvement, some of which are specifically designed to address environmental thresholds; 2) local plans, which set forth more specific planning guidelines and standards for much of the land area of the Tahoe Basin; 3) Tahoe Transportation District/Tahoe Metropolitan Planning Organization Projects and Programs; and 4) specific development projects that were known and reasonably foreseeable at the time the RPU EIS and RTP/SCS IS/MND/IEC/FONSE were under preparation.

17.1.2 Cumulative Growth, Programs, and Projects

CUMULATIVE GROWTH

Regional growth is guided and capped by the Regional Plan, which is implemented in part through local area plans. These plans represent the cumulative buildout conditions of the Region. As discussed in Chapter 4, "Land Use," the Shoreline Plan is one such plan, intended to guide and cap growth of structures within the shorezone. The analysis in Chapters 4 through 16 evaluate the cumulative effects of all shorezone structures that could be developed under each alternative, including cumulative increases in boating that would result from the structures. Some degree of growth in boat use would likely still occur due to surrounding population growth and increases in visitation, even without a Shoreline Plan. This cumulative analysis considers the combination of this background growth in boat use in the Region in combination with increases in boat use that would result from the Shoreline Plan alternatives.

While the Shoreline Plan would regulate the total number of boating facilities, cumulative growth in motorized boating could occur from: (1) additional launches at existing boat ramps, (2) additional use of personal watercraft (e.g., jet skis) that do not require shorezone structures, (3) an increase in the number of rental boats, and (4) an extended boating season due to climate change, all of which would increase motorized boat use on the lake. Background growth in boat use associated with launches at boat ramps, personal watercraft, and boat rentals is estimated to increase by 1.2 percent per year, which is equivalent to estimates of population-driven growth in boating prepared by the California Air Resources Board (CARB 2014). It is assumed that there would be no growth in the number of launches from a boat ramp during peak summer holiday weekends, because boat ramps generally operate at maximum capacity on peak days. However, the number of launches from boat ramps could increase on non-peak days, when ramps could absorb additional users. Increased boat use associated with rental boats could occur if moorings are converted from individual private use to accommodate additional rentals (e.g., if a marina rented fewer slips to private boat owners and instead used those slips for additional rental boats). The increase in personal watercraft and rental boat use could occur during both peak and non-peak periods. Overall, peak day boat trips are expected to grow by 3 percent (Exhibit 17-1) and annual boat trips are expected to grow by 11 percent (Exhibit 17-2) by 2040, even without implementation of a Shoreline Plan, due to background growth.

The cumulative increase in boat use is the amount of background growth in boat use plus the increase in boat use from the Shoreline Plan alternatives (Table 17-1). Cumulative increases range from a low-growth scenario under Alternative 4 (background growth only), to a high-growth scenario under Alternative 2 (48 percent increase in boat trips on a peak day, and 66 percent increase annually), see Exhibits 17-1 and 17-2.

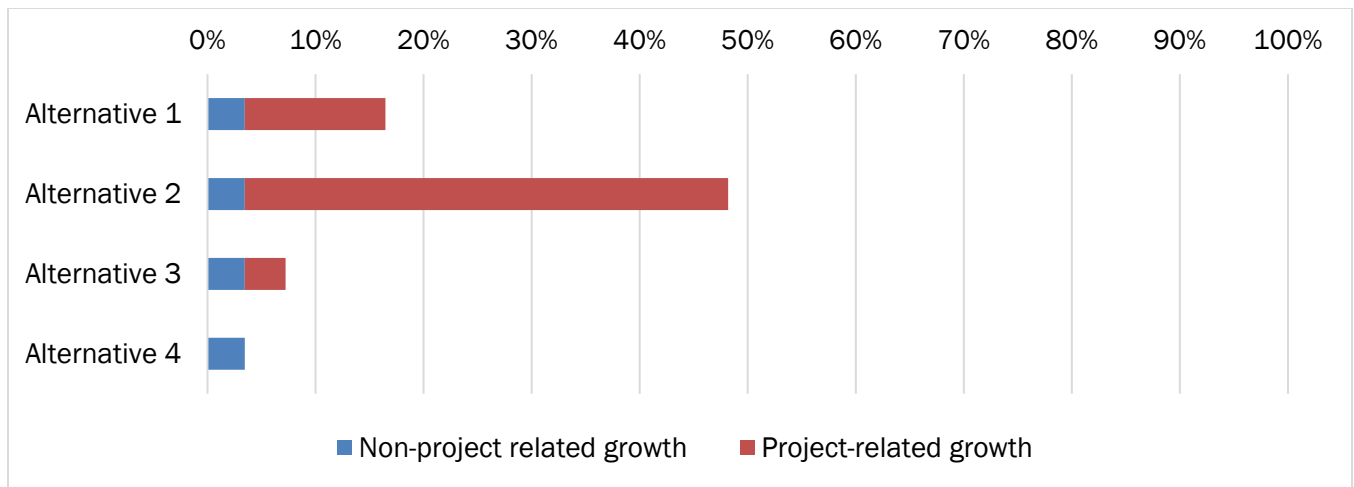


Exhibit 17-1 Estimated Cumulative Percent Increase in Peak Day Boat Trips, 2040

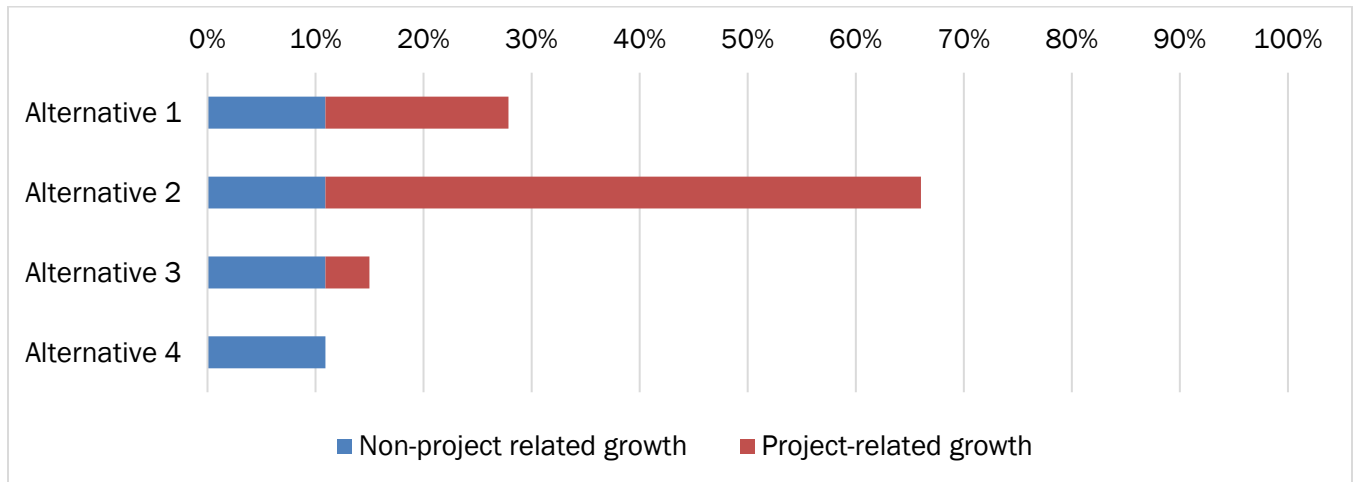


Exhibit 17-2 Estimated Cumulative Percent Increase in Annual Boat Trips, 2040

Table 17-1 Cumulative Peak Day and Annual Boat Use (engine hours, trips)

	Peak Day	Annual
Engine Hours		
Baseline Conditions	12,512	489,155
Baseline plus Background Growth	12,965	545,885
Alternative 1 Cumulative	14,549	626,653
Alternative 2 Cumulative	18,392	808,317
Alternative 3 Cumulative	13,435	565,653
Alternative 4 Cumulative	12,965	545,885
Boat Trips		
Baseline Conditions	5,899	234,102
Baseline plus Background Growth	6,103	259,656
Alternative 1 Cumulative	6,870	299,314
Alternative 2 Cumulative	8,741	388,692
Alternative 3 Cumulative	6,325	269,177
Alternative 4 Cumulative	6,103	259,656

CUMULATIVE PROGRAMS

Several existing programs will continue under any shoreline alternative. These programs, which are focused on environmental improvement, could combine with the effects of the Shoreline Plan on specific resources. Additional detail on cumulative programs is provided in Chapters 4 through 16, where applicable.

Cumulative programs that could combine with the effects of the Shoreline Plan include the following:

Environmental Improvement Program

The Lake Tahoe Environmental Improvement Program (EIP) is a partnership of federal, state, and local agencies, private interests, and the Washoe Tribe, created to protect and improve the extraordinary natural and recreational resources of the Tahoe Region and attain and maintain thresholds. EIP partners implement projects that fall within on or more of the six EIP areas: (1) watersheds, habitat, and water quality; (2) forest management; (3) air quality and transportation; (4) recreation and scenic resources; (5) applied science; and (6) program support. TRPA would continue to identify environmental improvement projects with a nexus with recreational impacts and present them as opportunities to advance expanded recreational access in concert with environmental restoration.

Lake Tahoe Total Maximum Daily Load

The Lake Tahoe Total Maximum Daily Load (TMDL) was developed in a partnership between the Lahontan Water Board and Nevada Division of Environmental Protection (NDEP) to address the declining transparency and clarity of Lake Tahoe. Because fine sediment particles, phosphorus, and nitrogen are responsible for the decline in lake transparency and clarity, Lake Tahoe is listed under Section 303(d) of the federal Clean Water Act as impaired by the input of these three pollutants of concern. Based on California law, the Lahontan Water Board has the obligation to implement and enforce the California Lake Tahoe TMDL through National Pollutant Discharge Elimination System (NPDES) discharge permits. NDEP's stated plan for implementing the Lake Tahoe TMDL for Washoe County and Douglas County is through memoranda of agreement (MOAs) with each jurisdiction. MOAs are a collaborative, legally nonbinding approach to implementing a TMDL. NDEP regulates the Nevada Department of Transportation and the Stateline Stormwater Association through NPDES discharge permits. California and Nevada will continue to require implementation of stormwater projects and other measures to reduce pollutant loading.

Sustainable Communities Strategy

The Tahoe Metropolitan Planning Organization (TMPO) and TRPA jointly developed the Lake Tahoe Regional Transportation Plan and Sustainable Communities Strategy (RTP/SCS) as Lake Tahoe's blueprint for a regional transportation system that enhances the quality of life in the Tahoe Region, promotes sustainability, and offers improved mobility options for people and goods. Important objectives of the RTP/SCS are to reduce the overall environmental impact of transportation in the Region, create walkable and vibrant communities, and provide real alternatives to driving. The RTP/SCS included an SCS, in accordance with California Senate Bill 375, statutes of 2008 (Sustainable Communities and Climate Protection Act). The RTP/SCS presents goals consistent with regional and federal requirements that focus on reducing dependency on the automobile and giving preference to projects that increase the capacity of the Region's transportation system through public transportation projects and programs.

Nearshore Agency Working Group

The Nearshore Agency Working Group (including representatives of TRPA, the U.S. Environmental Protection Agency, the Lahontan Quality Board, and the Nevada Division of Environmental Protection) is preparing a nearshore work plan, called the Nearshore Resource Allocation Plan, to guide nearshore monitoring and coordination needed to understand and manage nearshore conditions that affect water quality, including stormwater runoff, coverage, and fertilizer use.

Aquatic Invasive Species Management

The Tahoe Region's program to prevent and control aquatic invasive species (AIS) is expected to continue and expand. The program is governed and guided by the Lake Tahoe Region Aquatic Invasive Species

Management Plan, California–Nevada. This AIS management program includes mandatory boat inspections, decontamination of watercraft, and public education to prevent new introductions of AIS, and implementation of AIS control projects to manage or eradicate existing infestations.

CUMULATIVE SHORELINE PROJECTS

In addition to the cumulative analysis of buildout of the Shoreline Plan contained in Chapters 4 through 16, the cumulative programs, and the background growth in boating use described above, there are several reasonably foreseeable future projects that could combine with the effects of the Shoreline Plan on specific resources. These projects are described below and addressed in the cumulative analysis of each resource that follows.

Waterborne Passenger Ferry

The RTP includes a goal that calls for a passenger ferry service to transport residents, visitors, and commuters between North Lake Tahoe and South Lake Tahoe. This project would involve the redevelopment of two to three public piers and associated facilities on the north and south shores and operation of a passenger ferry between these points. This proposed project is in the early planning stages. Additional detail on the project is included in the 2017 RTP (TRPA 2017).

Public Safety Facilities

New public safety shorezone structures are allowed to provide lake access for public safety and emergency response (TRPA Code Section 84.10.1). One essential public safety facility is allowed in the shorezone for each of El Dorado, Placer, Washoe, and Douglas counties, and one for the U.S. Coast Guard. These facilities could be new facilities or modifications to existing facilities and could deviate from shorezone design standards to accommodate functionality. If they are no longer used as public safety facilities, they must be removed, or brought into conformance with design standards.

Tahoe Keys

Tahoe Keys is a homeowners association community of over 1,500 homes adjacent to a series of human-made canals and lagoons that provide water access to Lake Tahoe. An estimated 2,443 moorings are associated with private residences in Tahoe Keys. Its lagoons and boating facilities are not within the shoreline, so the future planning framework for the Tahoe Keys is not a subject of the Shoreline Plan. The Tahoe Keys are virtually built-out, so although there are specific development and redevelopment projects proposed in the community, the potential for substantial changes in boating levels is very low. However, the effects of future redevelopment of boating-related structures in the Tahoe Keys is considered in this cumulative analysis.

Kings Beach State Recreation Area General Plan and Pier Rebuild Project

California State Parks (CSP) is proposing to adopt a revised General Plan for the Kings Beach State Recreation Area (KBSRA). As a near-term project under the General Plan, CSP is proposing to rebuild the public pier within KBSRA. The rebuilt pier would be a combined fixed and floating pier located at the eastern edge of the park and reaching of approximately 488 feet in length. The pier would be open to the public but would not allow boat launches. As part of the pier rebuild project, CSP would remove the existing boat ramp within the park. CSP and TRPA released a Draft EIR/EIS for the project for public review from May 1 through June 29, 2018.

17.1.3 Cumulative Analysis

This section addresses the potential cumulative impacts for each resource topic, identified and summarized below. The geographic scope of the cumulative impact analysis for each resource is identified in Table 17-2. The analysis identifies: whether an existing significant adverse cumulative condition exists with respect to each resource, whether implementation of the Shoreline Plan alternatives in the context of past, present,

and reasonably foreseeable plans, programs and projects, would result in a significant cumulative impact, and whether the Shoreline Plan would represent a considerable contribution to the cumulative impact. In cases in which no existing significant cumulative condition is identified, the analysis addresses whether the incremental contribution of the Shoreline Plan alternatives, combined with those of related region-wide plans, programs, and projects, would create a significant cumulative impact.

Table 17-2 Geographic Scope of the Cumulative Impact Analysis by Topic

Topic	Geographic Scope
Land Use	Lake Tahoe Region
Fisheries and Aquatic Biological Resources	Shorezone and lakezone
Transportation	Lake Tahoe Region
Air Quality	Lake Tahoe Air Basin
Greenhouse Gas Emissions/Climate Change	Global
Noise	Localized (based on audibility and sensitive receptors) but may aggregate throughout the Shorezone
Geology, Soils, Land Capability, and Coverage	Geologic hazards – localized Coverage – Lake Tahoe Region Soil erosion – shorezone and adjacent upland areas
Hydrology and Water Quality	Lake Tahoe Hydrologic Basin
Scenic Resources	Localized (based on view shed and visibility) but may aggregate throughout the Lake Tahoe Region
Biological Resources	Lake Tahoe Region
Recreation	Recreation facilities – shorezone Demand for recreation – Lake Tahoe Region
Public Safety	Shorezone and lakezone
Cultural Resources	Shorezone and adjacent upland areas

LAND USE

Prior to adoption of the first Regional Plan and thresholds, development in the Tahoe Region included many damaging land development practices, including failure to recognize hydrologic and topographic limitations, unnecessary and widespread destruction of vegetation, realignment and pollution of streams, encroachment on flood plains, and disruption of natural drainages. These actions led to indirect impacts to various resources including water quality, air quality, biological resources, and recreation. The first Regional Plan, adopted in 1987, recognized the adverse cumulative condition resulting from such development and, in response, adopted land use policies and regulations to improve environmental conditions.

The Regional Plan and Code of Ordinances guide TRPA's land use planning efforts. In accordance with the Tahoe Regional Planning Compact, the Regional Plan was created as the practical guide for achieving the balance, or equilibrium, between the natural environment and the built environment articulated in the TRPA thresholds. The first iteration of the Regional Plan, developed in 1987, focused on growth control and on regulating development practices that degrade the natural and built environments. The Regional Plan was updated in 2012. It maintained the growth control system and environmental programs from the 1987 plan and added provisions to promote "environmental redevelopment" to replace older, environmentally degrading developments with more sustainable development and restored landscapes. The growth management system, limiting the number of development rights and allocations, concentrating development on high capability lands, and implementing the land use map, community plans, and plan area statements have facilitated environmental improvements since the original adoption of the Regional Plan. As such, there is no existing adverse cumulative land use condition in the Tahoe Region.

The four Shoreline Plan alternatives are intended to complement the Regional Plan in that they provide for implementation and design requirements for shorezone structures designed to assist in achieving the Regional Plan goals and attaining and maintaining TRPA thresholds. The policies addressed by the alternatives augment the Regional Plan and provide standards for development of structures within its framework. Development under the any of the Shoreline Plan alternatives, including development of the cumulative shoreline projects described above, would be required to conform with all other provisions of the TRPA Code and all existing land use designations, as specified by the Regional Plan and local plans. Plans, policies, and regulations associated with non-TRPA entities at the federal and state levels that govern the placement of shorezone structures would be adhered to, including any standards that are more stringent than the provisions of the Shoreline Plan. Consequently, there would be **no adverse cumulative condition** in the Tahoe Region with respect to land use that would result from implementation of the Shoreline Plan alternatives.

FISHERIES AND AQUATIC BIOLOGICAL RESOURCES

For more than a century, Lake Tahoe's aquatic biological resources have been affected by land use activities, lake development, fishing pressure, introduction of non-native aquatic species, and other factors. This has resulted in an assemblage of fish and aquatic biological resources that is different from natural historical conditions. Although actions and initiatives implemented to manage the lake's aquatic resources has improved lake ecology, changes will continue to occur. The combined effects on fish and aquatic biological resources from past, present, and reasonably foreseeable projects and actions considered under the future cumulative condition vary considerably. Key factors that may adversely affect the future conditions of aquatic biological resources in Lake Tahoe include the following:

- ▲ population growth immediately adjacent to the lake and within the lake's watershed, which will affect lake habitat, water quality, and lake clarity;
- ▲ development of new structures within the shorezone;
- ▲ increased recreational fishing
- ▲ increased recreational boating;
- ▲ introduction or spread of AIS;
- ▲ fish stocking programs; and
- ▲ changes in lake levels and water temperatures due to climate change.

In addition, TRPA and other parties have implemented, and will continue to implement policies, programs, and regulations intended to positively affect the future conditions of aquatic biological resources. These include:

- ▲ Lake Tahoe Restoration Act;
- ▲ Lake Tahoe Total Maximum Daily Load;
- ▲ regulations designed to protect aquatic species (e.g., no-wake zone and fishing regulations);
- ▲ aquatic habitat management and restoration activities,
- ▲ AIS detection, control, and eradication efforts; and
- ▲ Environmental Improvement Program projects.

The future cumulative condition of aquatic habitat in Lake Tahoe is anticipated to remain similar to the current condition or be somewhat further degraded due to expansion of AIS and climate change. These effects would be significantly adverse for some aquatic species and not adverse for others, relative to current conditions.

Climate change, increased nutrient loading to the lake, increased boat use, and increased angling activity could all promote AIS introduction and spread. The Shoreline Plan alternatives could contribute to the risk of AIS introduction and spread primarily through increased boating and angling. However, this risk would be more than offset by program provisions that would maintain AIS inspection programs and increase AIS control efforts. Because Alternative 4 would not increase boat use, the risk of AIS introduction or spread is substantially lower for Alternative 4 than for Alternatives 1, 2, and 3. Continued implementation of regulations, restrictions, policies, and fish habitat improvement actions by TRPA and other parties would help combat the factors that contribute introduction and spread of AIS and assist in eradicating existing infestations. Even with these programs, it is expected that the future cumulative conditions with respect to AIS will continue to be significantly adverse. However, as described in Chapter 5, "Fisheries and Aquatic Biology," the effects of each alternative on the introduction or spread of AIS would be less than significant. Alternative 1 would include a new funding mechanism that would increase the rate of AIS control, and Alternatives 2, 3, and 4 would include a mitigation measure that would increase the rate of AIS control. This program element and mitigation measure would reduce the risk of AIS spread, which would have a positive effect on the cumulative condition related to AIS. Therefore, the Shoreline Plan alternatives **would not make a considerable contribution** to a significant adverse cumulative effect related to AIS.

None of the Shoreline Plan alternatives would result in a loss of prime fish habitat. Alternatives 1, 3 and 4 would result in no net loss of prime fish habitat relative to baseline conditions because of the requirement to replace prime fish habitat at a ratio of 1.5:1. Alternative 2 does not allow placement of structures in prime fish habitat. Therefore, the alternatives would have **no impact** on prime fish habitat and therefore, **would not make a considerable contribution** to a significant cumulative condition pertaining to prime fish habitat.

Construction-related effects of the Shoreline Plan alternatives and the cumulative shoreline projects on Lake Tahoe aquatic habitat quality (including water quality), fish populations, invertebrate communities, and plankton communities would be minor, localized for any given structure, and temporary in nature. Consequently, these effects would not be of sufficient magnitude nor occur over a sufficiently long time-frame such that they could combine with the effects of other projects or actions to produce significant cumulative effects. Hence, the construction-related effects of implementing the Shoreline Plan alternatives would not, themselves, cause a new cumulatively significant impact to fish and aquatic resources, and they **would not make a considerable contribution** to an adverse future cumulative condition for fish and aquatic resources.

Although all of the alternatives would cause small amounts of habitat modification within the lake, none would result in a degree of permanent habitat modification or loss to cause a new significant, adverse future cumulative impact to lake habitat. Vast expanses of aquatic habitat would remain after buildout of any of the alternatives such that fish and aquatic organisms would be virtually unaffected with regard to habitat loss. The alternatives **would not make a considerable contribution** to any significant, adverse future cumulative habitat condition that may occur in the lake due to other future actions and factors.

Boat use is estimated to increase under the future cumulative condition due to buildout of the Shoreline Plan and population growth in surrounding areas, by about 66 percent under Alternative 2, 28 percent under Alternative 1, 15 percent under Alternative 3, and 11 percent under Alternative 4 (Exhibit 17-2). Because Alternative 4 would not itself cause increased boat use, it would neither cause a new future cumulative impact, nor contribute to any significant, adverse future cumulative condition for fish and aquatic resources caused by recreational activity. As described in Chapter 5, recreational activities (including increases due to the Shoreline Plan alternatives and population growth) in Lake Tahoe are heavily regulated and monitored for their potential direct adverse effects on fish and aquatic resources and their habitats. Due to the life history of species in Lake Tahoe, and the temporary and distributed nature of recreation activities, the cumulative condition related to recreation effects on fisheries would not be significantly adverse, for the same reasons described in Impact 5-5 in Chapter 5, "Fish and Aquatic Biological Resources." Therefore, future levels of boating and recreation in the lake would not cause significant, adverse future cumulative impacts to the lakes aquatic resources or habitats, and the alternatives **would not make a considerable contribution** to a significant adverse cumulative impact.

HYDROLOGY AND WATER QUALITY

Cumulative impacts to hydrology and water quality are considered in the context of the Lake Tahoe Basin. Historic activities such as logging, milling, mining, and grazing within the Tahoe Basin accelerated erosion and contributed to a decline in the clarity of Lake Tahoe. Urbanization and development altered the natural hydrologic regimes of many of the catchments in the Tahoe Region. Much of the urban development has occurred along the edge of Lake Tahoe, meaning that in many cases, there is little or no buffer between the source of pollution and the Lake. The nearshore of Lake Tahoe is an increasingly important focus for managers in the Region. It is the portion of the lake with which visitors and residents most often interact, and the presence of invasive species (e.g. Eurasian watermilfoil and curlyleaf pondweed) and anecdotal reports of change in nearshore conditions have heightened concern about the water quality of the nearshore. The effects of historic activities combined with runoff from urban and recreational developments have degraded the water quality of Lake Tahoe, resulting in an existing cumulative adverse condition.

The plans, projects, and programs that could combine with the Shoreline Plan to affect cumulative water quality conditions include those projects described above, as well as programs intended to improve water quality. The Lake Tahoe total maximum daily load (TMDL) was developed to address pollutant loading. Studies completed as part of the Lake Tahoe TMDL show that urban areas are the primary source of fine sediment (the pollutant known to impact lake clarity) (Lahontan & NDEP 2010). To achieve the goals set forth in the TMDL, local jurisdictions are implementing water quality improvement projects as described in each jurisdiction's Pollutant Load Reduction Plan or Stormwater Load Reduction Plan. Actions to meet water quality goals, as outlined in the TMDL, include practices and treatment options for urban uplands, forest land, atmospheric deposition, and stream channel erosion. In addition to the TMDL, TRPA requires water quality BMPs as the first line of defense to reduce stormwater runoff from developed properties. They include vegetating bare soils, building infiltration trenches, paving dirt roads and driveways, and other improvements that capture and reduce runoff to adjacent roads or properties. Additionally, the Environmental Improvement Program (EIP) includes numerous publicly- and privately-funded projects to restore disturbed areas of the watershed and reduce the adverse cumulative condition. EIP partners are retrofitting roads with stormwater quality improvements, restoring sensitive lands in the Upper Truckee River, Blackwood Creek, Ward Creek, Meeks Creek, Cold Creek, Second Creek, Rosewood Creek, and Incline Creek watersheds, among others. The EIP also includes land acquisition programs and more than 3,000 acres of land have been acquired by state and federal agencies. To address water quality condition within the nearshore, a nearshore agency working group has developed a Nearshore Protection Plan and a resource allocation plan to expand the understanding of the drivers of nearshore water quality and to allocate water quality improvements resources in the most effective manner possible.

The Shoreline Plan alternatives would authorize new shoreline structures. These alternatives and the cumulative projects described above could affect water quality through construction activities (e.g., dredging, pier construction, redevelopment of existing shorezone structures), and through operations (e.g., aerial deposition of pollutants or resuspension of lakebed sediment through increased boating activity).

As described in Chapter 6, "Hydrology and Water Quality," activities that could lead to erosion and/or release of pollutants to water bodies from shorezone construction and dredging activities are regulated by TRPA, Lahontan Water Board, Nevada Department of Environmental Protection, and federal and local agencies. Because all shorezone facility construction and maintenance, including dredging, that would occur would be required to conform with all applicable state, federal, local, and TRPA regulations pertaining to protection of water quality from construction-related discharges, and erosion and transport of sediment and other pollutants from a project site would be minimized to the extent feasible, individual projects and maintenance activities would not contribute to soil erosion or construction-related discharge impacts. Therefore, the Shoreline Plan alternatives and cumulative shorezone facility construction activities allowed under each alternative **would not make a considerable contribution** to a cumulative adverse condition related to hydrology or water quality.

Cumulative operational impacts could result from increases in pollutant loading from the direct entrainment or atmospheric deposition of pollutants from boat exhaust. The Waterborne Passenger Ferry, future changes

at the Tahoe Keys, and the public health and safety cumulative projects could each lead to additional boat activity. However, as described in Chapter 6, “Hydrology and Water Quality,” a net reduction in boating emissions, including emissions of oxides of nitrogen (NO_x) and particular matter (PM), would result as the increased boating hours are offset by fleet turnover, with older boat engines replaced with cleaner and more fuel-efficient boat engines. Thus, the Shoreline Plan would result in less direct entrainment and atmospheric deposition than under existing conditions and it **would not make a considerable contribution** to a cumulative adverse condition.

Cumulative operational impacts could also result from the combined hydrodynamic effects of motorized boating, which can disturb and resuspend lakebed sediment through propeller wash and boat wake, potentially leading to increased turbidity and reductions in nearshore clarity. Water quality effects from propeller wash and boat wake are generally limited to shallower areas, with no effects for water depths greater than 10 feet (Beachler and Hill 2003). TRPA Code Section 84.17.1 requires a no-wake zone within 600 feet of the shore with 5-mile-per-hour (mph) speed limit. Most of Lake Tahoe’s shallower depths are within the existing no-wake zone, with notable exceptions being the nearshore areas adjacent to South Lake Tahoe and Tahoe City.

Alternatives 1, 2, and 3 are projected to generate a peak-day increase in boating activity. On peak days, increased boat use could combine with existing boat use and background growth in boating activity to increase wave action and turbulence generated by boat wake. The shallower portions of the nearshore outside existing no-wake zone regulations are likely more susceptible to short-term and temporary declines in clarity because of increased wave action, relative to other nearshore areas. However, the alternatives include an expansion of the Nearshore Water Quality Network or a similar effort to include monitoring stations located within areas of shallow lakebed but outside the no-wake zone. If research generated by the monitoring concludes that boating activities contribute to an exceedance of TRPA’s nearshore thresholds, TRPA would implement management actions to avoid or offset this impairment. Thus while, the shoreline Plan alternatives have the potential to affect nearshore water quality, they would expand nearshore water quality monitoring and implement actions to improve nearshore water quality. This effort, when considered in combination with the TMDL, EIP, and other projects, plans and programs would result in a cumulative improvement in nearshore water quality conditions. Thus, the Shoreline Plan **would not make a considerable contribution** to a cumulative adverse condition related to hydrology or water quality.

SOIL CONSERVATION

The Bailey (1974) land classification system (described in Chapter 7) provides the basic concept of land development in the Lake Tahoe Region, emphasizing prevention of water resource and ecosystem damage while planning and executing development in the Region. Development prior to TRPA’s adoption of the land capability system included many damaging land development procedures, including failure to recognize hydrologic and topographic limitations, unnecessary and widespread destruction of vegetation, realignment and pollution of streams, encroachment on flood plains, and disruption of natural drainages. These actions led to the degradation of soil conditions and indirect impacts to various resources including water quality, air quality, biological resources, and recreation. The Regional Plan recognized the adverse cumulative condition resulting from such development and adopted policies and regulations related to land capability and coverage, as well as environmental threshold carrying capacities, aimed to improve the environmental conditions in the Region. Improvement of the cumulative adverse condition in the Region has been the focus of TRPA since.

Cumulative impacts related to land coverage, erosion, and changes to natural topography are considered in the context of the Lake Tahoe watershed. The cumulative projects described above, as well as the Shoreline Plan would adhere to regulations that would prevent increases in land coverage that exceed land capability limits, create soil disturbance that could lead to increased erosion, or make adverse changes to existing topography. Projects would be permitted on an individual basis and would be required to comply with the regulatory protections enforced by TRPA, Nevada Division of Environmental Protection, and the Lahontan Water Board. These protections control the amount of land coverage that can be created by any project, require temporary and permanent erosion control BMPs, and protect natural topographic features.

Therefore, because regulations are in place to protect geologic and soil resources for all cumulative projects within the Lake Tahoe watershed, including shorezone structures, the Shoreline Plan **would not make a considerable contribution** to cumulative adverse effects to these resources.

Seismic effects are localized by nature and are not cumulative. As discussed in Impact 15-4, because the potential for risk to people and structures would be minimized through the seismic design requirements of the California Building Code (CBC) and International Building Code (IBC), and because local hazard mitigation plans would continue to address seiche hazards through public education and development of early warning systems, this impact would be less than significant for all alternatives. Therefore, the alternatives **would not make a considerable contribution** to cumulative seismic impacts.

RECREATION

The Tahoe Region is a tourist destination with numerous recreational opportunities. Recreation services and facilities are located throughout the Region, within urban centers, forested land, along the shoreline, and on waterways. The Quality of Recreation Experience and Access to Recreational Opportunities recreation thresholds are in attainment. Recreational user surveys show the majority of recreational users are very satisfied with their recreational experience (TRPA 2016). The Region has seen a consistent increase in the amount of public land available for low-density recreational use and the number of amenities that provide access to that land. In addition, evaluation of the Fair Share of Recreation Capacity standard indicates an increase in recreational development that is consistent with the policy statement's direction that a "fair share" of resource capacity be available for public recreation, and the Region has experienced an increase in the amount of public land available to support recreational purposes (TRPA 2016). Because the threshold indicators demonstrate a reasonable level of recreational opportunities, experiences, and capacity, there is no existing adverse cumulative condition related to demand for recreation facilities and availability of outdoor recreation capacity.

While the Kings Beach State Recreation Area General Plan and Pier Rebuild Project would provide public access to the lake, there are no cumulative projects that would change public motorized boat use. Therefore, there would be no cumulative impact on access for motorized watercraft or other shoreline users, nor would the Shoreline Plan affect the fair share distribution of recreational capacity around the lake.

Population growth in outlying areas could increase overnight visitors to Lake Tahoe resulting in additional motorized boaters accessing the lake. Cumulative boat density with implementation of Alternative 1 would increase approximately 14 percent as compared to baseline conditions (see Table 17-3). Because of the size of Lake Tahoe (over 190 square miles) and the very low density of existing boating (over 20 acres per boat), this increase would not be noticeable by recreationists on the lake and in the shorezone such that the quality of recreation experience would be degraded. Cumulative boat density with implementation of Alternative 2 would represent an approximately 33 percent increase in boat density on the lake compared to baseline conditions (see Table 17-3). While this level of boat density is still relatively low at over 14 acres per boat, the change is substantial enough that it could contribute to a potentially significant impact related to quality of recreation experiences for motorized watercraft, nonmotorized watercraft, swimmers, and other beachgoers. However, with implementation of Mitigation Measure 8-1c, TRPA would revise the standards to decrease the rate at which new shorezone structures are approved, thus controlling the increase in motorized boats on the lake. TRPA would monitor recreation user satisfaction and if monitoring data indicate the need, the number of boat ramps and moorings could be capped if quality of recreation experience declines, which would also reduce the overall number of boats on the lake under cumulative conditions. Cumulative boat density with implementation of Alternative 3 would represent an approximately seven percent increase in boat density compared to baseline conditions (see Table 17-3). Cumulative boat density with implementation of Alternative 4 would represent an approximately four percent increase in boat density compared to baseline conditions. Under cumulative conditions, the increase in boat trips would not be substantially greater than the boat trips that would occur under buildout of each of Alternatives 3 or 4, as described in Impact 8-1, and would be similar to baseline conditions. For these reasons, there would be **no adverse cumulative condition** related to recreation.

Table 17-3 Peak Day Cumulative Boat Density

	Boat Density ¹					
	Boat Trips	Cumulative Growth in Boat Trips	Existing Plus Project Peak Day (boats/square mile)	Cumulative Peak Day (boats/square mile)	Existing Plus Project Peak Day (acres/boat)	Cumulative Peak Day (acres/boat)
Baseline Conditions	5,899	+204	31	32	20.8	20.1
Alternative 1	+767	+971	35	36	18.4	17.9
Alternative 2	+2,639	+2,843	44	46	14.4	14.0
Alternative 3	+222	+426	32	33	20.1	19.4
Alternative 4	No change	+426	No change	32	20.8	20.1

Notes: NA = not available

Additional detail on the data sources, assumptions, and calculations of boating activity and structure buildout are provided in Appendix A.

¹ The surface area of Lake Tahoe is approximately 122,880 acres, or 192 square miles.

Source: Compiled by Ascent Environmental in 2018

SCENIC RESOURCES

The visual landscape of the Tahoe Region possesses a striking combination of rugged mountain peaks, a vast lake surface, and densely forested slopes. These landscape elements work in concert to produce a visual impression that makes the Lake Tahoe Region one of the truly unique places in the world. Despite development and alteration of the landscape for over a century, the Tahoe Region continues to attract visitors due to its powerful and stunning inherent landscape character.

To maintain scenic values in the Region, as mandated by the Compact, the environmental thresholds include targets for roadways, the shoreline, and public recreation areas and bike trails. As described in Chapter 9, “Scenic Resources,” scenic thresholds have improved since 2001, indicating improvement in the cumulative scenic environment. The threshold standard for Scenic Quality is a non-degradation standard, meaning that a scenic resource is considered in attainment of the threshold standard so long as its scenic quality rating remains equal to or higher than the rating it was originally assigned. Thus, there is not an existing adverse cumulative effect associated with scenic quality in the Tahoe Region (2016).

Cumulative increases in boat use would not affect scenic resources, because the boats themselves are temporarily visible on the lake and consistent with Lake Tahoe’s character as a recreational destination. Other reasonably foreseeable cumulative projects could combine with the effects of the Shoreline Plan alternatives when they occur within the same viewshed.

After implementation of required mitigation measures, none of the Shoreline Plan alternatives would result in significant impacts related to scenic quality. In addition, future projects including those authorized under the Shoreline Plan and other reasonably foreseeable projects, would be evaluated when those projects are proposed. Project level review would include a scenic assessment consistent with the Scenic Resources/Community Design, and Light and Glare sections of TRPA’s Initial Environmental Checklist. The project-level review of future shoreline projects would require compliance with scenic regulations in the TRPA Code, including the visual magnitude system and mitigation requirements in Chapter 66. Prior to approving a shoreline structure or other project, TRPA would require feasible mitigation measures to reduce or avoid significant adverse environmental effects, including effects on scenic resources. Furthermore, Code Section 4.4.1.B requires that, prior to approving any project, TRPA must make a finding, based on evidence, that the project “will not cause the environmental threshold carrying capacities to be exceeded.” This finding would prevent TRPA from approving individual projects that could degrade a shoreline or roadway travel unit rating, or a scenic quality rating for a scenic resource. Therefore, the Shoreline Plan alternatives **would not make a considerable contribution** to a cumulative impact related to scenic resources.

AIR QUALITY

The Lake Tahoe Air Basin (LTAB) is designated as nonattainment with respect to TRPA's 8-hour average ozone threshold standard and TRPA's 24-hour average PM₁₀ threshold standard (TRPA 2016:3-8 and 3-9). CARB has designated the LTAB as nonattainment with respect to the California Ambient Air Quality Standards (CAAQS) for ozone and respirable particulate matter with an aerodynamic diameter of 10 micrometers or less (PM₁₀). These nonattainment designations are the result of emissions of ozone precursors, reactive organic gases (ROG), and NO_x, generated by cumulative development projects in the LTAB, as well as from transport of these same pollutants from outside the LTAB. This is also the case regarding the nonattainment status of the LTAB with respect to the CAAQS for PM₁₀. When all sources of ROG and NO_x in the LTAB are combined they result in a severe ozone problem. Similarly, when all sources of PM₁₀ in the LTAB are combined they result in a severe PM₁₀ problem. The nonattainment designations of the LTAB with respect to the CAAQS for ozone and PM₁₀ are the result of the emissions generated by cumulative development in the LTAB, as well as from transport of these same pollutants from outside the LTAB. When all sources of ROG, NO_x, and PM₁₀ throughout the Tahoe Region are combined they can result in a severe ozone and PM₁₀ problem, as expressed by a nonattainment status with respect to the CAAQS for these pollutants. The analysis of long-term emissions of ROG, NO_x, PM₁₀, and fine particulate matter with an aerodynamic diameter of 2.5 micrometers or less (PM_{2.5}) presented under Impact 10-1 in Chapter 10, "Air Quality," is an inherently cumulative analysis of the combined level of ozone precursor and particulate emissions from existing on-road vehicle travel, boating activity, and area sources in combination with new or increased boating activity and on-road vehicle travel that would result from implementation of the Shoreline Plan alternatives. While cumulative projects such as the Waterborne Passenger Ferry could increase air pollutant emissions during construction, and potentially decrease such emissions during operation (displacing vehicle trips), implementation of Shoreline Plan Alternatives 1, 3, and 4 would result in a net reduction in daily emissions of ozone precursors and particulate matter at buildout in 2040, as explained in Impact 10-1 and as shown in Tables 10-7, 10-9, and 10-10, respectively. Thus, long-term operational emissions under Shoreline Plan Alternatives 1, 3, and 4 **would not make a considerable contribution** to a cumulative impact.

Shoreline Plan Alternative 2 would result in a long-term increase in emissions of NO_x and CO. The long-term increase in NO_x, which is an ozone precursor, could contribute to the nonattainment status of the LTAB with respect to the CAAQS for ozone and/or an exceedance of TRPA's 1-hour ozone threshold standard of 0.08 parts per million (ppm). The long-term increase in CO could conflict with implementation of the CO maintenance plan and/or contribute to exceedances of TRPA's 8-hour threshold standard of 6 ppm. These adverse effects would be cumulatively considerable under Alternative 2. Mitigation Measure 10-2, however, would require TRPA to implement measures to ensure that boat emissions would not cause or contribute to an exceedance of the TRPA's numeric threshold standard for ozone, or the CAAQS for ozone or CO and thereby reducing this impact to a less-than-significant. Thus, long-term operational emissions under Shoreline Plan Alternative 2 **would not make a considerable contribution** to a cumulative impact.

As discussed in Impact 10-2, emissions of pollutants generated during construction are temporary in nature. Emissions are primarily associated with heavy-duty construction equipment and fugitive emissions from ground disturbance and earth-moving activities. Unmitigated emissions associated with construction projects in the LTAB that would occur under the Shoreline Plan alternatives would contribute on a cumulative basis to nonattainment conditions for ozone and PM₁₀. In addition, when taken together, construction-generated emissions would have the potential to result in violations of, or considerable contributions to violations of, ambient air quality standards.

All Shoreline Plan alternatives would implement Mitigation Measure 10-2, whereby TRPA would develop and implement a Construction Best Practices policy to reduce construction-generated emissions of ROG, NO_x, PM₁₀, and PM_{2.5}. Implementation of Mitigation Measure 10-2 would reduce fugitive PM₁₀ and PM_{2.5} dust emissions percent for each project and reduce diesel equipment exhaust emissions of NO_x and PM₁₀ by a minimum of 20 percent and 45 percent, respectively. This mitigation would minimize construction-generated emissions and an individual project's contribution to cumulative impacts for ozone and PM₁₀. Therefore,

cumulative construction-related emissions of ROG, NO_x, and PM₁₀ would be less than significant, and the project contribution **would not be cumulatively considerable**.

GREENHOUSE GAS EMISSIONS AND CLIMATE CHANGE

Greenhouse gas emissions are inherently cumulative in nature and are discussed in Chapter 11, “Greenhouse Gas Emissions and Climate Change.” Implementation of any of the Shoreline Plan alternatives would result in GHG emissions associated with the construction and demolition of boating facilities and on-road motor vehicle trips to and from new boating facilities. Under Alternatives 1, 2, and 3, implementation of the Shoreline Plan would also result in an increase in GHG-emitting boating activity. It is not feasible to know whether the fleet of motorized boats on Lake Tahoe will become more GHG efficient and, if it does, whether the improvement in GHG efficiency would be enough to offset the GHGs associated with construction activity, the increase in on-road motor vehicle travel, and the projected increase in boating activity. Therefore, this impact would be potentially significant. The development and implementation of a GHG Reduction Policy, as required by Mitigation Measure 11-1, would reduce GHG emissions, but the extent of this reduction depends on participation rates, available funding, and available technology. Given the uncertainty about the magnitude of the increase in GHG emissions under the Shoreline Plan and the uncertain effect of these mitigation measures, the Shoreline Plan alternatives **could have a considerable contribution to the cumulative impact** of GHG emissions and climate change. Mitigation Measure 11-1 requires the implementation of all feasible measures to GHG emissions from boating, shoreline construction, and vehicle trips associated with the Shoreline Plan. Because there is uncertainty in the magnitude of GHG reductions associated with the mitigation and there is no other feasible mitigation this impact would be significant and unavoidable for all alternatives.

NOISE

Many parts of the Tahoe Region are currently nonattainment with respect to TRPA-established noise standards. According to the 2015 Threshold Evaluation, single noise events from aircraft and motorized watercraft; and cumulative noise levels for several land uses and transportation corridors are not in attainment of threshold standards (TRPA 2016). Therefore, ambient noise in the Tahoe Region is an existing adverse cumulative condition.

Noise and vibration levels associated with construction of boating structures would be temporary, intermittent, and relatively minor. Further, construction-related noise and vibration is typically considered a localized affect, affecting the land uses closest to construction activities. Regulations are in place that would limit construction noise and vibration to the less sensitive times of the day and construction activities would implement construction noise-reducing measures required by TRPA, further reducing human disturbance. Given that construction activities associated with individual shorezone structures developed in accordance with the Shoreline Plan would be relatively minor, dispersed over time, and throughout a large area (i.e., entire lake shorezone), noise and vibration levels would be localized only affecting areas surrounding individual construction sites, and would occur during the less-sensitive times of the day, construction activities associated with Alternatives 1, 2, 3, and 4 would not substantially combine with noise from other construction activities or from construction of other cumulative shorezone structures such that it would cause a substantial increase in cumulative noise levels. This impact would **not be cumulatively considerable**.

Under the cumulative conditions, boating activity is anticipated to increase due to population growth and related increases in demand. Because the number of moorings is capped by the Shoreline Plan and growth in boat use associated with moorings is evaluated as part of the project and thus inherently cumulative, this background growth is considered applicable to the types of boating activity that could increase and are not limited by the Shoreline Plan. Because adoption of Alternatives 1, 3, and 4 would limit boating activity to some level, increases in the number of exceedances of single-event noise levels and cumulative noise levels influenced by boating activity would be similar for all the action alternatives, for which little correlation was found between boating activity and number of exceedances. Nonetheless, because of the existing 600-foot no-wake zone enforced by TRPA and the fact that most boat use occurs during the day, boat-related noise is

not a primary noise source affecting CNEL around the lake. Adoption of any of the alternatives would not contribute to the nonattainment status of TRPA thresholds and this impact would **not be cumulatively considerable**.

Long-term increases in traffic-noise on area roadways would be associated with cumulative background growth (future development and population growth within and outside the region) and increases in boating activity related to additional boat structures (e.g., boat ramps, slips, buoys). The number of structures of all types would be greatest with Alternative 2 at buildout, but would be limited with Alternatives 1, 3, and 4. As discussed under Impact 12-4, even if all additional project-generated traffic were to occur on roadways with the lowest existing traffic volumes, a substantial (i.e., 3 A-weighted decibels) increase in noise would not result. Further, increases in traffic would be dispersed around numerous roadways around the lake, thus resulting in much fewer additional trips on any one roadway segment. Because Alternatives 1, 3, and 4 would all limit boating activity by regulating boating structures, additional vehicle trips on affected roadways would also be limited and would not result in a measurable difference in roadway noise under the cumulative condition. In addition, cumulative programs (e.g., RTP/SCS) and cumulative projects (e.g., Waterborne Passenger Ferry) would seek to reduce vehicle trips and noise.

In addition, TRPA, pursuant to the requirements of Mitigation Measure 3.6-1 in the 2012 RPU EIS (TRPA 2012:3.6-15 through 3.6-16) and Mitigation Measure 3.6-4 of the 2012 RTP/SCS EIR/EIS, developed its Region-wide traffic noise mitigation program, which aims to reduce traffic noise levels along highways where they currently exceed applicable TRPA standards and maintain traffic noise levels along highways where they currently do not exceed TRPA thresholds. When this mitigation is completely implemented, traffic-noise levels on transportation corridors would be in attainment of TRPA thresholds. This impact would **not be cumulatively considerable**.

ROADWAY TRANSPORTATION AND CIRCULATION

Cumulative projects, including known, and as-yet unknown residential, commercial, tourist, transit/transportation, and recreational development in the Tahoe Region, would generate traffic trips that contribute to the cumulative intersection and roadway operations of the region. As described in Chapter 4, "Land Use," cumulative growth in the Region is limited by the growth control system of the Regional Plan. The analysis in this section reflects the cumulative growth within the Tahoe Region and includes vehicle use associated with complete buildout of all development allowed by the Regional Plan, construction and operation of reasonably foreseeable transportation projects and programs proposed as part of the Regional Transportation Plan, and growth expected to occur outside the Tahoe Region, which could increase vehicle use within the Region.

The 2017 RTP/SCS included updated LOS modeling for major roadway segments within the Tahoe Region for the 2040 (cumulative) conditions. The existing average daily traffic volumes and LOS for these major roadway segments are shown in Table 17-4.

Table 17-4 2040 Cumulative Roadway Segment Operations

Roadway	Roadway Segment	ADT	LOS	PM Peak Hour Volume	PM Peak Hour LOS
US 50	SR 89 (Luther Pass Rd.) to Navahoe Dr.	22,570	F	2,060	F
US 50	Pioneer Trail to Arapahoe St.	20,260	D	1,940	F
US 50	SR 89 to Dunlap Dr.	42,380	E	3,420	F
US 50	Tahoe Keys Blvd. to Winnemucca Ave.	39,870	D	3,210	E
US 50	Edgewood Cir. to Al Tahoe Blvd.	41,280	E*	3,300	E*
US 50	Pioneer Trail to Park Ave. / Heavenly Village Way	38,450	D	3,320	E*
US 50	Lake Parkway to SR 207 (Kingsbury Grade Rd.)	36,090	D	3,020	E

Table 17-4 2040 Cumulative Roadway Segment Operations

Roadway	Roadway Segment	ADT	LOS	PM Peak Hour Volume	PM Peak Hour LOS
US 50	SR 207 (Kingsbury Grade Rd.) to Kahle Dr.	27,780	C or better	2,450	D
SR 28	West of US 50	7,610	C or better	660	C or better
SR 28	Red Cedar Dr. to W. Lakeshore Blvd.	18,660	E	1,630	E
SR 28	SR 28 Cal Neva Dr. to Stateline Rd.	20,110	E**	1,790	E**
SR 28	SR 28 Brassie Ave. to SR 267 (N Shore Blvd.)	24,930	F	2,190	F
SR 28	N Lake Blvd. to Lake Forest Rd.	16,280	E	1,510	E
SR 89	South of Lester Beach Rd.	7,010	C or better	810	D
SR 89	Fallen Leaf Rd. / Heritage Way to Valhalla Rd.	7,370	C or better	940	D
SR 89	Tucker Ave. to US 50 (Lake Tahoe Blvd.)	19,950	C or better	1,900	D
SR 267	North Ave. to Tiger Ave.	15,100	E	1,460	E
SR 89	US 50 to Pomo St.	5,370	C or better	540	C or better
US 50	North of Lincoln Hwy	18,020	E**	1,790	E**
SR 207	US 50 to Kahle Dr.	14,250	D	1,370	D
US 50	SR 28 to Kings Canyon Rd.	16,150	C or better	1,360	C or better
SR 431	SR 28 to 2nd Creek Dr.	7,340	C or better	670	C or better
SR 267	Tahoe Rim Trail to Gas Line Rd.	12,960	D	1,240	D
SR 89	West of Fairway Dr.	20,740	E**	1,870	E**

Notes: ADT = Average Daily Traffic. Level of Service (LOS) in bold font indicates an exceedance of the LOS standard.

* Operations degrade from four or less hours at LOS E (acceptable) to five or more hours of LOS E (unacceptable)

** Currently unacceptable LOS E operations are degraded to a significant degree (v/c ratio increases by more than 0.05)

Source: TRPA 2017

As indicated in Table 17-4, multiple roadway segments (shown in bold) would operate at unacceptable LOS under cumulative conditions. The 2017 RTP/SCS also included updated LOS modeling for cumulative (2040) conditions of major intersections within the Tahoe Region shown in Table 17-5.

Table 17-5 2040 Intersection Operations

Intersection	Jurisdiction	City/Community	LOS/Average Delay (seconds)
SR 28 / SR 267	Caltrans	Kings Beach	E / 69
SR 28 / Village Boulevard	NDOT	Incline Village	D / 37
US 50 / SR 89 (south Y)	Caltrans	South Lake Tahoe	C / 27
US 50 / Ski Run Boulevard	Caltrans	South Lake Tahoe	C / 25
US 50 / Park Avenue	Caltrans	South Lake Tahoe	D / 39
SR 28 / SR 89	Caltrans	Tahoe City	C / 24
US 50 / SR 207	NDOT	Kingsbury	C / 27

Notes: Existing conditions representative of a Friday afternoon/evening peak hour in August.

Source: TRPA 2017

As shown in Table 17-5, all intersections listed would meet applicable LOS standards. As discussed in described in Impact 13-1 of Chapter 13, structures that would potentially be developed under the Shoreline Plan (i.e., public buoys, slips, boat ramps) could result in additional vehicle trips that would be added to the circulation network within the Tahoe Region. However, the timing, location, and intensity of development under the Shoreline Plan alternatives are not known at this time.

As shown in Table 13-4 in Chapter 13, “Automotive Transportation and Circulation,” at buildout and during future cumulative peak summer traffic periods the Shoreline Plan alternatives would generate the following number of new vehicle trips:

- ▲ Alternative 1: 632 vehicle trips,
- ▲ Alternative 2: 2,723 vehicle trips,
- ▲ Alternative 3: 423 vehicle trips, and
- ▲ Alternative 4: no new vehicle trips.

As shown in Table 17-4 and 17-5, multiple roadway segments would operate at unacceptable LOS under 2040 conditions. Additionally, several intersections would operate at LOS just above an acceptable LOS; and thus, the addition of new project generated trips could result in an increase in delay and degradation of LOS to unacceptable levels at these intersections. Thus, Alternatives 1, 2, and 3 could add traffic volumes in a direction or at a location that would exacerbate an LOS deficiency or degrade an acceptable LOS in the cumulative scenario. Thus, the addition of project generated trips under Alternatives 1, 2, and 3 could contribute to a significant cumulative impact.

However, Chapter 3 of the TRPA Code of Ordinances requires that TRPA review any proposed project to determine if it would result in a significant environmental effect. This project-level environmental review would include an evaluation of the project-generated trips and effects on LOS (see TRPA Initial Environmental Checklist Section 13, and Code of Ordinances Section 65.2). Prior to approving a marina expansion, public boat ramp, or other project TRPA would require feasible mitigation measures to reduce or avoid significant adverse environmental effects, including effects on LOS. Furthermore, Code Section 4.4.1.A requires that, prior to approving any project, TRPA must make a finding, based on evidence, that the project “...will not adversely affect implementation of the Regional Plan, including all applicable Goals and Policies....” This finding would prevent TRPA from approving a marina expansion, public boat ramp, or other project that would exceed the LOS standards identified in Regional Plan Policy T-10.7, or add vehicle trips to a roadway or intersection operating at a deficient LOS. Therefore, effects on LOS would be analyzed and mitigated, if necessary, at the project level.

Alternative 4 would not generate and vehicular traffic; and thus, would not exacerbate an existing LOS deficiency or degrade an existing acceptable LOS. Thus, the Shoreline Plan alternatives **would not make a considerable contribution** to a significant cumulative impact.

The analysis of region-wide VMT resulting from buildout of the alternatives is presented in Chapter 13. That analysis also accounted for cumulative growth that could occur throughout the rest of the Lake Tahoe Region consistent with the TRPA Regional Plan, to allow for comparison of regional VMT under the alternatives to TRPA’s regional VMT threshold standard. Table 17-6 shows summer daily VMT in the Tahoe Basin under baseline 2015 conditions and in cumulative 2040 conditions for each alternative, assuming full buildout of the Tahoe Basin. The VMT threshold is periodically updated whenever the TRPA updates its transportation model. The most recent VMT threshold was calculated at 2,030,938 for a peak summer day, based on the 2014 model update. Existing summer daily regional VMT is estimated to be 1,937,070, or 93,868 below the TRPA threshold standard based on the most recent modeling completed to support the Tahoe Regional Transportation Plan (TRPA 2016) but is projected to increase to 2,168,384 by 2040 with normal growth, not accounting for adoption of a Shoreline Plan. Therefore, even without adoption of a Shoreline Plan, Basin-wide VMT are expected to surpass the VMT threshold by 2040. In future cumulative conditions for all alternatives, daily summer VMT in the Tahoe region would increase by various amounts. Some cumulative programs (e.g., RTP/SCS) and cumulative projects (e.g., Waterborne Passenger Ferry) would seek to reduce VMT. However, under cumulative conditions for all alternatives, VMT would exceed the TRPA regional VMT threshold standard of 2,030,938.

However, as described in Chapter 50 of the TRPA Code of Ordinances, two years after each release of land use commodities (which are released in 4-year cycles), TRPA is required to monitor VMT and only release commodity allocations upon demonstrating through modeling and the use of traffic counts that the TRPA VMT threshold standard shall be maintained over the subsequent 4-year period (see Code of Ordinances Section 50.4). Therefore, the monitoring of VMT, and release of commodity allocations contingent on achievement of the TRPA VMT threshold standard would prevent region-wide VMT from exceeding the threshold standard of 2,030,938. This is consistent with the findings of the 2017 RTP/SCS IS/IEC which determined that the mitigation presented in the 2012 RPU EIS (and subsequently incorporated into the TRPA Code of Ordinances as Section 50.4) would be applicable to the current RTP and would adequately resolve the impact. Thus, the Shoreline Plan alternatives **would not make a considerable contribution** to a significant cumulative impact for VMT.

Table 17-6 Region-Wide Daily Summer VMT under Future Cumulative Conditions with Buildout of Each Alternative

	Baseline 2015	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Cumulative Region-wide VMT (2040)	n/a	2,168,384	2,168,384	2,168,384	2,168,384
Cumulative Plus Project Region-wide VMT	1,937,070	2,179,752	2,217,391	2,175,997	2,168,384
TRPA Threshold Standard	2,030,938	2,030,938	2,030,938	2,030,938	2,030,938
Standard Met	No	No	No	No	No

Notes: n/a = not applicable. Additional details provided in Appendix A
 Source: TRPA 2016; Data provided by Ascent Environmental in 2018

TERRESTRIAL BIOLOGICAL RESOURCES (WILDLIFE AND VEGETATION)

Osprey, bald eagle, and waterfowl are designated by TRPA as special interest species and use the shorezone and adjacent locations for breeding and foraging. As described in Chapter 14, “Terrestrial Biological Resources,” the osprey population in the Tahoe Basin has increased over the last several years; and, bald eagles have nested consistently in two areas of the Tahoe Basin (Marlette Lake and Emerald Bay), with a third bald eagle nest site recently documented at Sugar Pine Point along the west shore. The Tahoe Basin is also a wintering area for bald eagles, and the wintering population is considerably greater than during the breeding season. Because of increased recreational encroachment into wetland areas over the last several decades, habitat quality at TRPA-designated waterfowl population sites has been degraded; however, populations of waterfowl that occur in the Tahoe Basin are not considered rare or threatened.

As described in detail in Chapter 14, potential effects of the Shoreline Plan alternatives on osprey and bald eagle could include construction-related disturbances to nesting activities from new piers and boat ramps, long-term increased disturbance to osprey and bald eagle and suitable habitat from boating and other recreational uses, and habitat degradation within TRPA-designated osprey and bald eagle disturbance zones. Although suitable nesting habitat for waterfowl is limited in the shorezone where new projects would be permitted (e.g., outside of TRPA-designated waterfowl population sites), construction-related activities that may occur within suitable habitat could disturb nesting attempts of waterfowl. The types of potential impacts to osprey, bald eagle, and waterfowl would be similar for Alternatives 1, 2, 3, and 4, with some differences in magnitude based on the locations, amounts, and quality of habitats potentially affected. However, with implementation of Mitigation Measures 14-1a and 14.1b, potential disturbances to osprey and bald eagle nest sites and disturbance zones, and disturbance or loss of waterfowl nests, under Alternatives 1, 2, 3, and 4 would be avoided, minimized, or compensated for. Through implementation of these project-level mitigation measures, the breeding productivity and population sizes of these species, and availability of suitable habitat in the region, would be fully mitigated. Therefore, the Shoreline Plan’s potential contribution to the existing significant cumulative impact on waterfowl habitat would not be considerable; and, the incremental contribution of the Shoreline Plan alternatives, combined with those of related region-wide plans, programs, and projects, **would not make a considerable contribution** to a significant cumulative impact on osprey or bald eagle.

Tahoe yellow cress (TYC) is a sensitive plant species found only on the sandy beaches of Lake Tahoe. This species is designated as a sensitive plant and threshold indicator species by TRPA and is state-listed as critically endangered and endangered by the states of Nevada and California, respectively. Therefore, a baseline significant cumulative impact exists for this species. The current attainment status of the TRPA threshold indicator for TYC is “considerably better than target.” However, the attainment status may change from year to year depending on the number of TYC plants found during annual surveys.

Alternatives 1, 2, 3, and 4 of the Shoreline Plan would result in construction and operation of new shorezone structures within beach habitats. Depending on the specific locations and size of individual projects in relation to TYC occurrences and suitable habitat, construction-related activities that may occur within or adjacent to beach habitat occupied by TYC could result in the direct removal of TYC plants, or other disturbances through inadvertent trampling, soil disturbance, and dust deposition. Over the long term, the additional recreation capacity for motorized watercraft, nonmotorized watercraft, anglers, swimmers, and beachgoers could increase the frequency of recreationists within occupied TYC habitat, which could result in additional trampling, degradation, or loss of existing TYC, and adversely affect current or future TYC habitat suitability. The types of potential impacts to TYC would be similar among Alternatives 1, 2, 3, and 4, with some differences in magnitude based on the amounts and locations of beach habitats potentially affected.

Subsection 61.3.6 of the TRPA Code states that “all projects or activities that are likely to harm, destroy, or otherwise jeopardize sensitive plants or their habitat, shall fully mitigate their significant adverse effects. Those projects or activities that cannot fully mitigate their significant adverse effects are prohibited.” Additionally, in California, because TYC is listed as endangered under CESA, any take of TYC would require authorization by CDFW through a California Fish and Game Code Section 2081 incidental take permit. For Alternatives 1, 2, 3, and 4, any potential loss of TYC plants as a result of Shoreline Plan implementation would be a project-level significant impact. However, with implementation of Mitigation Measure 14-2, potential impacts to TYC would be less than significant for all alternatives. With implementation of Mitigation Measure 14-2, TYC plants that are present in areas of potential disturbance would be identified before construction and disturbances to those plants would be avoided. To protect TYC plants from potential long-term increased beach use and disturbance as an indirect result of increased recreation activity in the shorezone, protective fencing and educational signage about the need to avoid these areas would be installed around all TYC clusters on beaches that may be affected. Therefore, with the project mitigation measures implemented, the project **would not make a considerable contribution** to a significant cumulative impact to Tahoe yellow cress.

PUBLIC HEALTH AND SAFETY

Chapter 15, “Public Health and Safety,” identifies potentially significant impacts related to an increase in boating accidents due to increased boating and navigational hazards. Specifically, public piers that extend beyond the no wake zone and the 53 percent increase in annual boat trips over baseline conditions that could result with implementation of Alternative 2 could lead to a substantial increase in boating accidents.

Under the cumulative conditions, boating activity is anticipated to increase due to population growth and corresponding increases in demand consistent with increases statewide. Because the number of shorezone structures is capped by the Shoreline Plan and growth in boat use associated with shorezone structures is evaluated as part of the project, this cumulative growth is only applicable to the sources of boating activity that are unaffected by the shoreline plan. In other words, most of the potential boating safety impact would be borne out of and attributable to the proposed Shoreline Plan rather than from background growth or cumulative projects. The project’s impacts combined with the incremental increase in boating activity due to population growth would result in cumulatively considerable impacts to public safety.

With implementation of Mitigation Measure 15-1a, new public piers for Alternatives 1, 3, and 4 and multiple-use piers for Alternative 2 would be required to demonstrate that safe lateral access for nonmotorized watercraft and swimmers would be provided within the no wake zone. A 200-foot buffer area between motorized watercraft in motion and nonmotorized recreationists outside of no wake zones would also reduce

conflict between motorized and nonmotorized uses. With implementation of Mitigation Measure 15-1b, TRPA would revise the standards for approval of new shorezone structures that would increase motorized boats on the lake so that the rate of new moorings or boat ramps are approved is metered, based on close monitoring of Lake Tahoe boating accident statistics. Therefore, upon implementation of Mitigation Measure 15-1a and 15-1b, the project's contribution to cumulative impacts to public safety would **not be cumulatively considerable**.

The Shoreline Plan could result in increased activity in the nearshore, foreshore, and backshore, which could hinder emergency responders' ability to access boaters and swimmers in the water. Furthermore, low water conditions during drought years and under future projected climate scenarios would present a challenge for emergency responders, as some existing lake access points are unavailable during low water conditions. Alternatives 1 and 2 would implement low lake level adaptation strategies which would ensure sufficient shoreline emergency access during low water conditions. Under Alternatives 3 and 4, buoy floats and anchors within buoy fields would be allowed to move farther lakeward during periods of low lake levels, but those alternatives contain no other provisions to allow modifications to facilities or structures to be useable during such conditions.

Under cumulative conditions, boating activity is anticipated to increase because of population growth and corresponding increases in demand consistent with increases in statewide. This could further increase activity in the nearshore, foreshore, and backshore, hindering emergency responders' ability to access boaters and swimmers in the water, as well as increase the demand for emergency response. Because most of the emergency responders' watercraft are located on the water, lake access is not an issue for most first responders. TRPA Code section 84.10.2 establishes a framework to provide essential emergency access and egress to and from Lake Tahoe to protect public health and safety would reduce shoreline emergency access impacts. However, Alternatives 3 and 4 do not contain low lake level adaptation strategies and shoreline emergency access could be hindered during low water conditions. The impacts from Alternatives 3 and 4, combined with the incremental increase in demand for emergency response due to population growth, would result in cumulatively considerable impacts to shoreline emergency access.

Mitigation Measure 15-3 would adopt low lake level adaptation strategies for Alternatives 3 and 4 that would accommodate lake access at a wider range of water level conditions, thereby reducing potentially significant impacts to shoreline emergency access because such strategies would maintain sufficient lake access for emergency response providers during low water conditions. Therefore, the alternatives' contribution to cumulative impacts to shoreline emergency access would **not be cumulatively considerable**.

CULTURAL RESOURCES

Development from all Shoreline Plan alternatives, including reasonably foreseeable development projects (including those listed above) and currently unknown projects, would have the potential to result in a cumulative loss or destruction of historical resources in the region. The intensity of development would be lowest under Alternative 4, and highest under Alternative 2. The potential to disturb historical resources would be greater for alternatives with higher levels of development. However, TRPA requires a project-level evaluation of potential effects on cultural resources (see TRPA Initial Environmental Checklist Section 20); and TRPA, state, and federal lead agencies require mitigation of potential effects on known or unknown cultural resources as a standard practice.

As described in Chapter 16, "Cultural Resources," impacts to known and unknown historical and archeological resources, and ethnic and cultural values would be avoided and minimized through implementation of Mitigation Measures 16-1 and 16-2. These mitigation measures would offset the project's contribution by requiring historic and archeological evaluations before development starts and would require protective measures for significant resources identified. With implementation of Mitigation Measure 16-1 and 16-2, the Shoreline Plan **would not make a considerable contribution** to cumulative impacts on cultural resources.