Chapter 15
PUBLIC HEALTH AND SAFETY

15-1. INTRODUCTION

This chapter presents a description of existing conditions in the Shorezone area with respect to public health and safety, and identifies potential environmental impacts on public health and safety that could result from each of the five alternatives. Public health and safety are not environmental factors, but it is important for public decision makers to consider how features of the proposed alternatives may affect health and safety issues.

Public health and safety within the Shorezone includes numerous elements such as boating safety, personal watercraft (PWCs) safety, emergency access, source water, uniform building code, weather, spatial conflicts, and existing structures. The statistics noted in this chapter point to a strong increase in boating accident trends. The evidence suggests that the increase results from a total increase in the number of boats in use. The data suggests that little of the increase can be attributed to navigational hazards such as structures, for increasing accidents are primarily associated with one watercraft colliding with another.

REGULATORY CONSIDERATIONS

The federal, state, and local agencies empowered to regulate boating safety cooperate with one another. This cooperation between jurisdictions results in multiple-agency responses to boating emergencies. A neighboring jurisdiction may be the first to respond to an accident. This interagency cooperation is advantageous to both the agencies and the boater who needs assistance on the water.

Tahoe Regional Planning Agency

TRPA’s Regional Plan documents, particularly the Goals and Policies (Goals), Plan Area Statements (PAS), and Code of Ordinances (Code), include policies establishing the importance of public health and safety and establish provisions for necessary protection. In addition, the TRPA Rules of Procedure allows expedited review of emergency projects to protect public health and safety. The Code provides the most direct provisions for public health and safety concerns.

The Shorezone Chapters of the Code include provisions for public health and safety. Chapter 51 includes safety, navigational, and public service facilities as allowed uses in the Shorezone and lakezone throughout the Region. These facilities include navigational buoys, navigational lighting, scientific monitoring devices, and radio communication devices. Chapter 54 regulates the placement of safety and navigation devices in the foreshore and nearshore. Chapter 55 allows land coverage and land disturbance in the backshore for construction of public service facilities necessary for erosion control or public health and safety. Chapter 50 requires TRPA to find that proposed Shorezone or lakezone projects do not adversely impact navigation or create a threat to public safety prior to project approval. TRPA relies on the assessment of those agencies with jurisdiction over a lake’s navigable waters to meet this finding. These findings are generally discussed at the Shorezone Review Committee’s monthly meetings. The Shorezone Review Committee consists of all public agencies exercising jurisdiction on Lake Tahoe; this includes the U.S. Army Corps of Engineers, CA and NV State Lands, and the U.S. Coast Guard.
Federal Agencies

U.S. Army Corps of Engineers (Corps)
The Corps regulates navigational safety on Lake Tahoe with respect to navigational hazards other than boats, pursuant to Section 10 of the Rivers and Harbors Act. For example, prior to issuance of a permit for a pier, TRPA must find that the structure would not create a navigational hazard. TRPA relies on the Corps in making the finding that a navigational hazard does not exist for the proposed structure.

Federal Boat Safety Act of 1971
This act specifically addresses boating safety. It provides authority for the Secretary of Transportation to establish minimum safety standards for boats and associated equipment. The U.S. Coast Guard Boating Safety Manual sets safety standards for Lake Tahoe, a navigable water body of the United States. In part, federal law prohibits motorized watercraft within 300 feet of Pope, Baldwin, El Dorado, and Nevada Beaches.

United States Coast Guard
The Coast Guard is the overall search and rescue lead on Lake Tahoe. All Marine Units described below report to Coast Guard Station Tahoe when on patrol. The Coast Guard also has vast resources from Sacramento and the Bay Area to respond to any and all emergencies and large environmental spills. The Coast Guard is operational year round and has two patrol boats that regularly conduct patrols and respond to emergencies. The mission of Station Tahoe is Search and Rescue only. All environmental spill responses would be coordinated through the National Response Center.

United State Navy
The U.S. Navy provides additional air search and rescue capabilities. They are located at Naval Air Station in Fallon, Nevada and regularly participate in search and rescue in and around Lake Tahoe.

State Agencies

Nevada Department of Wildlife (NDOW)
NDOW regulates boating safety pursuant to the Nevada Boat Act. Patterned after U.S. Coast Guard regulations, the Nevada Boat Act provides for the investigation of boating accidents on the Nevada side of Lake Tahoe, and the regulation of watercraft equipment and operation, and anchoring and mooring of watercraft to buoys.

El Dorado, Douglas, Washoe and Placer County Sheriff’s Departments, and the City of South Lake Tahoe’s Police Department
These law enforcement agencies implement either the California Department of Boating and Waterways’ regulations, known as the California Boating Law or the Nevada Boat Act for their respective jurisdictions. The Sheriff’s Departments also have other resources to respond to emergencies. Examples would be County Search and Rescue Teams and Air Search and Rescue.

Tahoe-Douglas Fire, Incline Fire Department, and South Lake Tahoe Fire Department
The fire departments assist in rescue activities on Lake Tahoe. They utilize inflatable boats to perform shallow water rescues when larger vessels cannot approach the rescue scene due to water depth and the presence of rocks.

Nevada State Parks
Rangers from NV State Parks generally patrol Cave Rock and Sand Harbor. In emergency situations they can respond to assist local agencies.
Volunteer Organizations and Private Companies

**Coast Guard Auxiliary** is a volunteer organization that assists the U.S. Coast Guard in its mission of boating safety. They conduct regular patrols on Lake Tahoe looking for boaters in distress, and hazards to navigation. Additionally, they conduct vessel safety checks, boater safety courses, and have air patrols that can be used for Search and Rescue.

**Vessel Assist** is a for fee or membership service which provides on-water assistance to boaters on Lake Tahoe. They provide towing assistance, fuel, sea battery jumpstarts, engine fluids, basic engine parts, and ungrounding assistance services to boaters. This service helps to eliminate potential safety concerns with disabled boats.

**The Uniform Building Code (UBC)**

The UBC is designed to implement safe and consistent construction standards and designs. Due to the lack of a UBC that specifically addresses piers, building departments may enforce and interpret the UBC differently. Consequently, depending on the County, a specific permit for construction may be required. The County Building Departments' requirements, in general, are outlined below.

- **The City of South Lake Tahoe Building Department** does not require permits pursuant to UBC for the installation or maintenance of structures located below the high water line.
- **Douglas County Building Department** issues permits for all aspects of construction in the Shorezone. In Douglas County there are no building codes for handrails on piers. However, if there are stairs to a pier or stairs from a pier to another location on the same pier, handrails would be required for the stairs.
- **El Dorado County Building Department** issues permits for all aspects of construction in the Shorezone. In El Dorado County, there are no building code requirements for handrails on piers extending into navigable waters, although they are recommended for any stairs located on the pier.
- **Placer County Building Department** does not require permits for the installation or maintenance of a structure located below the high water line, although mechanical elements of a Shorezone structure, such as electrical circuits and plumbing, do require permits.
- **Washoe County Building Department** requires permits for all aspects of a Shorezone structure, including structural engineering, electrical, mechanical, and plumbing components.

Local building departments' enforcement of the UBC requirements in the Shorezone has been, at times, inconsistent due to the lack of UBC that specifically addresses piers. Some of the local building departments are often reluctant to issue permits for Shorezone structures due to the potential liability. This is highlighted by the fact that out of four building departments, all four have differing interpretation of the UBC as it pertains to structures below the highwater line.

As a result of the above local policies, some Shorezone structures are constructed without local building permits. Fortunately, most structures appear to be over-engineered structurally because they are designed to withstand the forces of wave action and currents.

Piers are by their very nature an "attractive nuisance" (UBC). An attractive nuisance is generally defined as a structure that may present a safety hazard simply by their presence. An example of this is when a person is drawn to a structure, such as an abandoned building,
to see what is inside. This applies to piers as when a person wants to walk out to the end to see what is there. Potential safety issues may occur when people walk on a pier, walk under one during low water, or climb over one during highwater. These situations may present a liability problem for property owners.

15-2. EXISTING PUBLIC HEALTH AND SAFETY CONDITIONS

BOATING LAW ENFORCEMENT

As noted above, the TRPA regulates navigational safety as it pertains to the approval of structures, but exercises little authority over the conduct of vessels underway on Lake Tahoe. The noted exceptions to this are the 600-foot no wake zone from the waterline that was instituted to reduce noise, recreational, and wildlife impacts in the Shorezone; the regulation of carbureted two-stroke engines; and noise standards. TRPA Code Chapter 8, Compliance, applies to all projects and activities in the Lake Tahoe Region. Article IX, Compliance Procedures, in the TRPA Rules of Procedure, outlines quasi-judicial procedures intended to provide notice and opportunity to be heard and promote settlement of violations without litigation in civil court.

The above procedures do not grant citation authority to the TRPA Compliance Division staff. The existing TRPA enforcement framework is dissimilar from that of the local authorities, which traditionally enforce boat operation violations. This dissimilarity prevents Sheriff’s Departments from enforcing most TRPA ordinances, existing or proposed. Nevada Department of Wildlife can only enforce the statutes and limitations of the Nevada Boat Act (Messmann, 1997. Personal Communication). In order for local authorities to enforce a TRPA ordinance, each state must enact an identical provision within its specific boating law framework. (The only exception to this is in California, which has adopted the carbureted two-stroke ban in its local restrictions and the noise standards.) Because of the difference in the states’ laws and the TRPA ordinances, only TRPA staff may enforce any future TRPA ordinance intended to control the operation of vessels on the Lake, unless each State legislates the same change to its boating laws. Any future changes to the TRPA ordinances would require more resources for enforcement than are currently available to TRPA. The existing procedures outlined in the Code and Rules of Procedure can be used, although some procedural amendments would be required for enforcement efforts to become efficient.

The California Department of Boating and Waterways is concerned about increases in the disproportionate accident and injury rates due to the operation of personal watercrafts (PWC). As a result, the agency has recommended that PWC users be trained to properly operate their vessels through an instruction package to be made available to boating safety instructors. Educational efforts are particularly aimed at decreasing the number of alcohol-related accidents. Through increased education, California hopes to reduce accident rates (California Boating Safety Report, 1995). In addition, as of January 1, 1998, California adopted regulations prohibiting PWC operators from undertaking reckless practices (such as wake jumping within 100 feet of another vessel); requiring PWC operators to attach lanyard switches to their person; and imposing limits on the operation of motorboats based on age, horsepower and length of a vessel. With some exceptions, no person under 16 years of age may operate a motorboat of more than 15 HP (California Boating Safety Report, 1997). The State of California’s reaction to its own data may indicate that increases in accidents, injuries, and fatalities are notable, but not alarming, as California has recently rejected measures such as imposing stricter minimum age limits for motorized watercraft operators (Baumgardner, 1997. Personal Communication).
In 1996, the State of Nevada enacted legislation requiring concessionaires to properly instruct all operators of rented PWCs; their emphasis is on education first, enforcement second (Messmann, 1997. Personal Communication). Nevada authorities point out that existing boating safety laws appear to be inadequate because the limited resources available thwart enforcement efforts. During 1995, NDOw patrolled Lake Tahoe on a vessel for 104 hours. During that time period, 1,683 contacts were made (16 contacts per hour on average), 43 citations issued, 137 warnings issued, and 288 boat checks made. For each hour on the water, 1.7 enforcement actions were taken (Nevada Department of Wildlife, 1995 Boating Safety Report). This data suggests that there may be more problems with existing enforcement capability than with existing boating safety regulations.

**BOATING SAFETY**

The increase in boating accidents is a concern in the Region and throughout the two states. Boating safety is a function of vessel preparedness, operator skill, weather, and navigational hazards.

**Accident Statistics**

In 2001, there were approximately 12,876,346 numbered boats in the U.S. Nationwide; there were 681 reported fatalities, approximately 5.1 deaths per 100,000 registered boats (US Coast Guard, 2001). Nearly 70 percent of all reported accidents involve operator controllable factors. The primary causes of accidents are operator inattention, careless/reckless operation, operator inexperience, operating at an unsafe speed, and no proper lookout. “Capsizing” and “Falls Overboard” accounted for 386 fatalities, nearly 60 percent of all reported boating fatalities. Nine out of every 10 of those victims drowned. “Collision with Another Vessel” was the most reported type of accident. These accidents resulted in 1,366 injuries and accounted for nearly nine million dollars in property damage (US Coast Guard, 2001). Despite the increasing number of boats operating, boating accidents resulting in fatalities in the United States have decreased from 924 fatalities in 1991 to 681 in 2001. (US Coast Guard 2001).

State and Federal agencies collect boating accident statistics at Lake Tahoe. Differences exist in reporting techniques, requiring individual examination for complete understanding.

**Federal** - Coast Guard data gathered during federal fiscal years (October 1 – September 31) 1990 through 1996, shows boating incidents on Lake Tahoe peaked in 1992 at 310, but then dropped to a seven-year low of 158 in 1996 (U.S. Coast Guard Statistics, 1990-96). In 1990 and 1991, four fatalities occurred on the California side of the Lake. The data does not distinguish boating accidents from boating incidents. Many responses are to vessels in distress due to mechanical problems or severe weather conditions. Coast Guard and Red Cross officials state that no more than 15 percent of all accidents were reported, due to ignorance of reporting laws, or difficulty in enforcing reporting laws. The U.S. Coast Guard 2002 Annual Report By State shows that a total of 53 deaths occurred in California and 8 in Nevada with no specific waters identified. These numbers, on average, are similar to the pervious years’ data.

**Nevada** - An NDOW Boating Accident Synopsis for 1993 through 2002 reported an increasing trend in boating accidents during these years on the Nevada side of the Lake. Between 1998 and 2002, the accident average has been seven, with 2002 seeing the highest rate of 10. The statistics in Table 15-1 do not differentiate between PWCs and larger vessels, but represent actual accidents as opposed to incidents.
Data on statewide trends reported by NDOW clearly shows an increasing trend in the number of boating accidents. Table 15-2 summarizes this information, beginning in 1964, and provides annual counts between 1990 and 2002. The data shows an increase from an average of 48 accidents statewide per year during 1964 to 1969, to an average of 313 accidents statewide per year during 1990 to 2002, although accident rates of steadily decreased since 1997. Property damage varies widely from 1990 to 2002, with 1991 showing the highest property damage numbers ($758,980) and 2000 having the lowest ($216,291). Table 15-2 summarizes the trends in injuries and fatalities on Nevada waters between 1964 and 2002 and includes estimated property damage amounts.

### Table 15-2. Trends in Injuries and Fatalities on Nevada Waters From 1964 to 2002

<table>
<thead>
<tr>
<th>Year</th>
<th>Boats Registered</th>
<th>Total No. of Accidents Reported</th>
<th>Total No. of Vessels Involved in Accidents</th>
<th>Persons Aboard</th>
<th>No. of Fatalities</th>
<th>No. of Injured Persons</th>
<th>Amount of Property Damage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1964-69</td>
<td>--</td>
<td>242</td>
<td>274</td>
<td>--</td>
<td>19</td>
<td>57</td>
<td>$328,100</td>
</tr>
<tr>
<td>1970-79</td>
<td>--</td>
<td>568</td>
<td>645</td>
<td>--</td>
<td>50</td>
<td>109</td>
<td>$1,096,900</td>
</tr>
<tr>
<td>1980-89</td>
<td>--</td>
<td>837</td>
<td>897</td>
<td>--</td>
<td>59</td>
<td>270</td>
<td>$2,627,777</td>
</tr>
<tr>
<td>1990</td>
<td>42,694</td>
<td>170</td>
<td>244</td>
<td>476</td>
<td>4</td>
<td>70</td>
<td>$516,669</td>
</tr>
<tr>
<td>1991</td>
<td>43,164</td>
<td>178</td>
<td>258</td>
<td>473</td>
<td>4</td>
<td>68</td>
<td>758,980</td>
</tr>
<tr>
<td>1992</td>
<td>43,819</td>
<td>174</td>
<td>253</td>
<td>535</td>
<td>0</td>
<td>40</td>
<td>320,261</td>
</tr>
<tr>
<td>1993</td>
<td>45,990</td>
<td>191</td>
<td>296</td>
<td>510</td>
<td>3</td>
<td>49</td>
<td>315,956</td>
</tr>
<tr>
<td>1994</td>
<td>47,921</td>
<td>287</td>
<td>405</td>
<td>730</td>
<td>9</td>
<td>108</td>
<td>439,801</td>
</tr>
<tr>
<td>1995</td>
<td>51,584</td>
<td>306</td>
<td>448</td>
<td>826</td>
<td>6</td>
<td>100</td>
<td>655,732</td>
</tr>
<tr>
<td>1996</td>
<td>55,626</td>
<td>188</td>
<td>255</td>
<td>525</td>
<td>9</td>
<td>104</td>
<td>302,948</td>
</tr>
<tr>
<td>1997</td>
<td>58,059</td>
<td>199</td>
<td>300</td>
<td>583</td>
<td>6</td>
<td>75</td>
<td>425,116</td>
</tr>
<tr>
<td>1998</td>
<td>59,404</td>
<td>159</td>
<td>246</td>
<td>483</td>
<td>8</td>
<td>62</td>
<td>705,071</td>
</tr>
<tr>
<td>1999</td>
<td>60,639</td>
<td>156</td>
<td>241</td>
<td>469</td>
<td>2</td>
<td>53</td>
<td>634,741</td>
</tr>
<tr>
<td>2000</td>
<td>61,566</td>
<td>143</td>
<td>208</td>
<td>431</td>
<td>3</td>
<td>74</td>
<td>216,291</td>
</tr>
<tr>
<td>2001</td>
<td>61,622</td>
<td>152</td>
<td>233</td>
<td>535</td>
<td>5</td>
<td>82</td>
<td>678,631</td>
</tr>
<tr>
<td>2002</td>
<td>60,211</td>
<td>122</td>
<td>177</td>
<td>439</td>
<td>52</td>
<td>8</td>
<td>341,800</td>
</tr>
</tbody>
</table>

Grand Total 4,072 5,380 7,015 239 1,329 $10,364,774


**California** - In 2002, California Department of Boating and Waterways reported a statewide total of 911 boating accidents, involving 468 injuries, 53 fatalities and $3.7 million in property damage. The number of accidents is the highest reported since 1997 (926 accidents), although fatalities were slightly lower (43 vs. 53 in 2002). Table 15-3 indicates the rates of...
boating accidents in California from 1992 through 2002 (California Department of Boating and Waterways, 2002).

### Table 15-3. 1992 to 2002 Boating Accidents in California

<table>
<thead>
<tr>
<th>Year</th>
<th>Total No. of Accidents</th>
<th>Total No. of Injuries</th>
<th>Total No. of Fatalities</th>
<th>Total Amount of Property Damage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1992</td>
<td>689</td>
<td>447</td>
<td>59</td>
<td>$4,360,100</td>
</tr>
<tr>
<td>1993</td>
<td>743</td>
<td>434</td>
<td>67</td>
<td>$2,052,800</td>
</tr>
<tr>
<td>1994</td>
<td>709</td>
<td>386</td>
<td>40</td>
<td>$1,740,300</td>
</tr>
<tr>
<td>1995</td>
<td>833</td>
<td>490</td>
<td>52</td>
<td>$2,536,500</td>
</tr>
<tr>
<td>1996</td>
<td>850</td>
<td>537</td>
<td>56</td>
<td>$2,241,700</td>
</tr>
<tr>
<td>1997</td>
<td>925</td>
<td>526</td>
<td>43</td>
<td>$3,266,800</td>
</tr>
<tr>
<td>1998</td>
<td>772</td>
<td>413</td>
<td>58</td>
<td>$2,299,600</td>
</tr>
<tr>
<td>1999</td>
<td>907</td>
<td>491</td>
<td>42</td>
<td>$2,299,600</td>
</tr>
<tr>
<td>2000</td>
<td>906</td>
<td>524</td>
<td>51</td>
<td>$3,038,400</td>
</tr>
<tr>
<td>2001</td>
<td>907</td>
<td>502</td>
<td>48</td>
<td>$2,841,900</td>
</tr>
<tr>
<td>2002</td>
<td>911</td>
<td>468</td>
<td>53</td>
<td>$3,732,850</td>
</tr>
</tbody>
</table>


Both Nevada and California have recently instituted increased public education efforts to combat the rising number of boating accidents. Hagler-Bailly's *Watercraft Use Study, Preliminary Report, 1998*, examined current understanding of navigation rules. This survey found that 67 percent of boaters owning property on Lake Tahoe and 69 percent of those using boat ramps and marinas indicated they were personally familiar with navigation rules. However, most of the Lake Tahoe property owners had not taken a boating safety course (60 percent), although the percent dropped for those using marinas and boat ramps (44 percent).

#### Operator Factors

Statistical information collected across the United States in 2001 suggests that a boater is most likely to die while cruising in a boat 16 feet in length or less, on a Saturday in July, between the hours of 2:30 p.m. and 4:30 p.m., on calm waters with light wind, and with good visibility. Water temperature is likely to be 70-79 degrees Fahrenheit (see Weather Factors, discussed below). Forty-four percent of fatalities are the result of operator error, with alcohol use involved in 31 percent of those accidents. The most common type of accident resulting in injury or death is collision with another vessel (US Coast Guard 2001).

Boating accidents occur most often when the number of boats on the water has peaked, and the greatest danger to boaters is other boaters. In response, the Coast Guard's *Boating Safety Manual* primarily addresses the type and use of safety devices that are located on vessels, not on shore. The manual requires boaters to operate their vessels “...at a safe speed so that she can take proper and effective action to avoid collision and be stopped within a distance appropriate to the prevailing circumstances and conditions.” Safe speed is determined by and based on factors such as visibility, traffic density, the maneuverability of the vessel, the presence of background light at night from shore lights or back scatter of the vessel’s own lights, the state of wind, sea, and current, the proximity of navigational hazards, and the draft in relation to the available depth of water.

Increasing numbers of accidents are caused not only by increased boating use, but may also be a result of the type of vessel used, and the experience of the vessel operator. Over
the last decade, the number of personal watercraft in use on Lake Tahoe has increased dramatically. Personal watercraft-involved accidents are on the rise.

Spatial Conflicts

Boating accidents may occur as a result of conflicting recreational uses on the Lake. Spatial conflicts occur, in particular, where different types and sizes of vessels encounter one another. This is of particular concern related to use of personal watercraft (PWC) and is discussed in more detail below.

Most of the current parasail operations on Lake Tahoe launch the parasailor from a boat well out in the lakezone. Parasail operations that use land starts, as opposed to launching from a boat, may create a safety hazard to beach users and recreationists using small craft (such as kayaks or PWCs) in shallow waters. PWC operators have become entangled with parasail lines that have been allowed to hang close to the water's surface during launch. Parasailors themselves may not be in perfect control of their landing, and may injure themselves or others.

The safety of swimmers is commonly guarded by the delineation of swim areas. Safety hazards resulting from the above-mentioned conflicts could also be reduced by the delineation of "recreational zones" to separate conflicting uses. For example, personal watercraft operations could be distinctly separated from parasail operations where conflicts have been identified.

Personal Watercraft (PWC)

An increasing number of accidents are not only the result of increased boating use, but may also be a result of the type of vessel used. Personal watercraft (PWC) are licensed and regulated like any other vessel, although they are seldom operated in a similar fashion as a recreational boat. The U.S. Environmental Protection Agency estimates that nationwide use of PWCs constituted approximately four percent of all watercraft use in 1993 and would rise to over 20 percent by 2007 (USGS 1998). These predictions have become a reality in that the number of registered PWCs in Nevada is 23% (Coast Guard 2002). California reports PWCs as an inboard, which does not allow the percentage to be easily calculated. Ease of operation, shallow draft, and high maneuverability enable an inexperienced boater to pilot a personal watercraft almost immediately. These same features encourage operation with many quick, tight turns and sudden periods of acceleration. Other watercraft that venture close become hazards if the PWC operator loses control. The result is an increasing number of collisions between two PWCs, and between PWCs and other boats. In 2001, 60 percent of PWC accidents involved another PWC (2002, California Boating Safety Report). In response, most established PWC rental concessions require their customers to remain confined to a specific area of the Lake to reduce the potential for conflict with other watercraft. However, the confinement of personal watercraft may pose conflicts to other types of beach and Lake recreation users.

Since the carbureted two-stroke ban took effect in 1999, the number of PWCs in use on Lake Tahoe has increased dramatically. The Nevada Department of Wildlife estimates that there were 14,324 PWCs registered in Nevada in 2001. Of the 152 accidents reported in 2001, 58, or 38 percent involved PWCs, and resulted in two fatalities (F. Messman, personal communication, 2003). Information available for 1992 and 2002, showed that the total number of registered boats in Nevada rose from 43,819 in 1992 to 60,211 in 2002, an increase of 73 percent.

In 2003, the Lake Tahoe Nevada State Park reported a total of 13,386 boat launchings at their Lake Tahoe facilities, an increase of 17.5 percent over 2002 launching numbers. These
numbers confirm an upward trend of boating use at Lake Tahoe, of which some would be PWCs. However, Nevada State Park no longer keeps separate records of PWC launchings (Table 15-4).

<table>
<thead>
<tr>
<th>Park Launch Area</th>
<th>Total Boats Launched 2002</th>
<th>Total Boats Launched 2003</th>
<th>Percentage Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sand Harbor</td>
<td>5,983</td>
<td>7,133</td>
<td>-19.2%</td>
</tr>
<tr>
<td>Cave Rock</td>
<td>5,410</td>
<td>6,253</td>
<td>+15.6%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>11,393</strong></td>
<td><strong>13,386</strong></td>
<td>+17.5%</td>
</tr>
</tbody>
</table>


PWC registration totals rose from 90,977 to 157,687 in California, from the years 1993 to 2002 (California Department of Boating and Waterways, 2002). As of December 31, 2002, there were 157,687 PWC registered in California, comprising 18 percent of registered vessels (California Department of Boating and Waterways, 2002).

California Department of Boating and Waterways reported the following general findings in their 2002 Boating Accident Report:

- PWC operators in the 11-20 age group were involved in more accidents than any other age groups, followed by the 21-30 age group.
- Of the 253 PWC accidents reported, 167 involved collisions with other vessels. Sixty percent (100) of the collisions involved a PWC colliding with a second PWC.
- Someone other than the registered owner operated 70 percent of PWCs involved in accidents; 50 percent were borrowed, and 17 percent were rented.

Although PWCs account for 18 percent (157,687) of all vessels registered in California, Department of Boating and Waterways statistics (2002) show that PWCs were involved in 28 percent of all accidents, 40 percent of all injuries, 13 percent of all fatalities, and 14 percent of all property damage. Table 15-5 shows that a high proportion of accidents were determined to be the fault of a PWC operator (Cause of Accident) (California Department of Boating and Waterways, 2002).

<table>
<thead>
<tr>
<th>Type of Accident</th>
<th>Percentage of Accidents</th>
</tr>
</thead>
<tbody>
<tr>
<td>With other PWC</td>
<td>60</td>
</tr>
<tr>
<td>Falls overboard</td>
<td>13</td>
</tr>
<tr>
<td>Struck by boat</td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cause of Accident</th>
<th>Percentage of Accidents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operator inattention</td>
<td>60</td>
</tr>
<tr>
<td>Excessive speed</td>
<td>57</td>
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</tbody>
</table>

Source: California Department of Boating and Waterways, 2002

WEATHER FACTORS

High winds and cold water temperatures may pose the greatest natural threat to the safety of boaters on Lake Tahoe. Persons operating small craft on the West Shore, after losing control of their vessel or becoming separated from their vessel, have been blown across the
Lake by west winds, and have landed on the East Shore. Persons separated from their vessel in deeper, colder waters are subject to hypothermia in a matter of minutes, and may lose consciousness if not rescued promptly.

**STRUCTURES**

California Senate Bill 349 identifies private recreational piers as providing safe harbor and anchorage for vessels and protecting the public from navigational hazards along California's waterways; “Therefore, their proliferation along California's waterways, including Lake Tahoe, is beneficial to the public's interest and should be encouraged.” The Shorezone Partnership Committee debated whether private piers provide safe harbor or anchorage, or protect the public from navigational hazards. Piers themselves may be a navigational hazard. The benefit of structures to boating safety depends upon a structure's ability to attenuate waves and currents.

Open piling piers do not protect boaters from winds or wave action. Despite the findings made in California Senate Bill 349, it is not universally recognized that the presence or absence of piers significantly benefits public health and safety. Conversely, piers usually are not found to be safety hazards. Most new structures are located among existing structures that have previously dictated navigational patterns. However, longer structures that project beyond the pierhead line may be navigational hazards.

Fences located below the high water line become navigational barriers if the fence is submerged. Fences have been installed at a number of locations around the Lake during times of drought, primarily on properties adjacent to public beaches. As the water level has risen, some of these fences have become inundated, and may not be visible to watercraft at all times.

Reported incidents of vessels colliding with structures are few; however, TRPA staff have received reports of vessels colliding with buoys during peak boating weekends. Rising Lake levels have resulted in some buoy floats becoming submerged, because they were installed at a length appropriate for low lake levels, and not adjusted as the levels rise. It is likely that vessels sometimes strike submerged buoys in any location. Due to their relatively small size, when compared to other structures, new buoys may pose a navigational hazard to those unfamiliar with the locations of new structures, particularly during severe weather or at night.

**EMERGENCY ACCESS**

Emergency Lake access is provided primarily by the marinas and boat ramps. The access points are spatially distributed fairly well, with the noted exceptions of the East Shore between Sand Harbor and Deadman's Point, just north of Glenbrook Bay, and the area around Emerald Bay. Since most of the emergency responders’ watercraft are located on the water, lake access not an issue for a majority of first responders. Access on the California side is fairly abundant due to CA Senate Bill 349, which allows for using private piers in emergency situations. Due to the proximity of local hospitals and factors of emergency transportation, Medivac helicopter transports are the preferred ambulatory method for patients in serious condition. Helicopter operations require a large, unobstructed area for the safety of the crew and the public. This factor along, with boating access, is a key consideration for using marinas and boat ramps as the preferred emergency access sites.

Lake geography determines, to some extent, where Lake access points may be located. Backshore slope must be gentle enough to allow vehicular access. Ideal access points are
protected from prevailing winds and oriented to avoid negative impacts created by littoral drift. Lake bottom slope should drop off sufficiently to allow marina channels or boat ramps to function during low water conditions.

Some existing access points were unavailable during low water conditions. These low water years are unavoidable. The emergency response agencies will generally know which emergency access points are available in a given year. The addition of additional access points may not improve the emergency response of a given accident. The fact is that the responders are on patrol on any given day, and to improve response times the access would need to be located where the emergency takes place.

The added benefit of local SAR Helicopter operations may mitigate the access problems of inaccessible areas of Lake Tahoe. If the emergency warrants, rescue operations can take place from water-to-air or from watercraft-to-air for direct transport to the appropriate medical facility. This added ability gives emergency responders the flexibility to prioritize each emergency situation and transport each patient in the most efficient method depending on their injuries.

15-3. SUMMARY OF PROJECT ALTERNATIVES

As discussed in Chapter 2 of this EIS, the different alternatives would have varied effects on Shorezone development at Lake Tahoe.

ALTERNATIVE 1 – NO PROJECT ALTERNATIVE

This alternative would continue current practices for the review of Shorezone projects under the existing TRPA Code of Ordinances.

ALTERNATIVE 2 – PROPOSED PROJECT ALTERNATIVE

This alternative would result in revisions to the Shorezone provisions of the Code of Ordinances based on the consensus agreements of the Shorezone Partnership Group, direction from the Shorezone Policy Committee, and TRPA staff revisions for consistency, streamlining, and environmental adequacy. The general goal of this proposal is to assure all littoral parcels are eligible to apply for a pier and sufficient buoys to access the lakes of the Region; that all related impacts would be mitigated; and that all applicable environmental thresholds would be attained. The prohibition on the location of Shorezone structures in prime fish habitat would be eliminated under this alternative. This alternative would also include a new scenic review system and would introduce the concept of private, quasi-public, and public structures to provide the basis for design standards and deviation from those standards.

ALTERNATIVE 3 – NO FISH HABITAT RESTRICTIONS ALTERNATIVE

This alternative would continue all Shorezone provisions of the current TRPA Code, except that the prohibitions on Shorezone structures located in fish habitat areas would be eliminated, including stream setbacks. In addition, this alternative would allow littoral parcel owners, who also have the availability of a multiple-use facility, to apply for their own private Shorezone structure.
ALTERNATIVE 4 – PUBLIC STRUCTURES ONLY ALTERNATIVE

This alternative would remove the prohibition on locating Shorezone structures in prime fish habitat. The prohibition of Shorezone structures within 200 feet of a stream mouth would remain unchanged. However, in order to promote thresholds, this alternative allows new or expanded structures for public facilities (open to the general public) only. No new or expanded private structures are allowed.

ALTERNATIVE 5 – REDUCED DEVELOPMENT ALTERNATIVE

This alternative would prohibit the construction of private single-use Shorezone structures. Under this alternative, only multiple use structures would be permitted and would require a 2:1 structure reduction mitigation for private multiple use and quasi-public structures, and a 1:1 structure reduction mitigation for public multiple use structures.

Table 15.6 below provides a summary of the main project features of the five proposed alternatives and provides an abbreviated overview of their differences. Table 15.7 provides a summary of the overall total buildout numbers for the five alternatives.

<table>
<thead>
<tr>
<th>Table 15-6. Summary of Project Alternatives</th>
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<tr>
<td>Project Features</td>
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<tr>
<td>Streamlined Review</td>
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<tr>
<td>New Structures</td>
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<tr>
<td>Private Structures</td>
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<tr>
<td>Quasi–Public Structures</td>
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<tr>
<td>Public Structures</td>
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<tr>
<td>Repairs/ Modifications</td>
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<tr>
<td>Reduction in Structures</td>
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<table>
<thead>
<tr>
<th>Table 15-7. Full Buildout Numbers by Alternative</th>
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<tbody>
<tr>
<td>Structure Type</td>
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<tr>
<td></td>
</tr>
<tr>
<td>Piers</td>
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<tr>
<td>Buoys</td>
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<tr>
<td>Ramps</td>
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<tr>
<td>Floating Docks</td>
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<tr>
<td>Slips</td>
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*Totals do not include new extensions/expansions.
15-4. STANDARDS OF SIGNIFICANCE

TRPA is required by the Compact to regulate activities within the Tahoe Region that may substantially impact the environment. As mentioned previously, public health and safety are not environmental factors, but they are an important consideration for public decision-makers. In addition, features of the proposed alternatives may affect health and safety issues described in this chapter.

The evaluation of potential impacts to public health and safety resources is based on each alternative’s potential to conflict with existing or proposed land uses in the Shorezone area. In this analysis, an alternative is considered to have a significant impact on public health and safety resources if it would result in any of the following:

- Increase in boating accidents due to increased boating use;
- Increase in boating accidents due to an increase in navigational hazards; or
- Decrease in emergency access to the Shorezone.

SUMMARY OF POTENTIALLY SIGNIFICANT IMPACTS

Implementation of the proposed alternatives would affect public health and safety, largely due to impacts associated with new obstructions to navigation, increased boat traffic, and emergency access. These elements increase the risk of boating accidents and affect emergency access capabilities. Alternative 3 would allow the greatest development potential and would increase public safety concerns compared to the other alternatives considered. The operation of motorized watercraft and their proximity to water intake lines could also affect drinking water quality and, as a result, would be a public health concern. Drinking water quality issues, along with potential impacts and mitigations are discussed in Chapter 5 of this DEIS, Water Quality.

This analysis identifies the following potentially serious effects on public health and safety as a result of implementation of any of the proposed alternatives:

- Increased boating accidents between boats due to higher numbers of boats (including personal watercraft) operating in limited space.
- Increased boating accidents due to higher numbers of boats and increased navigational hazards (i.e. more and larger structures).
- Decreased emergency access due to a reduction or addition of boat ramps and private piers

Boating Use and Accidents

Section 15.2 above includes a discussion of the factors involved in boating accidents and identifies other boaters as the greatest threat to boating safety. All the alternatives considered except Alternative 5 would allow increased boating use on Lake Tahoe compared to present conditions. This increased boating use would aggravate all of the factors that contribute to boating accidents, except the weather, specifically:

- Increased numbers of watercraft produce increased accidents as clearly shown by current trends, even if all the other contributing factors remain unchanged.
- Increased numbers of watercraft would increase overall boat density in many locations, including along popular shorelines, at the entrance to marinas and boat
ramps, and near concession operations. Spatial conflicts between types of watercraft would worsen at increased densities.

- Assuming the increase in percentage of PWC use compared to total boat use continues, accident trends would worsen compared to the existing relationship. PWCs are more likely to be involved in an accident even though they are a small representation of the population of all watercraft.
- Increased boating further stresses the local enforcement capabilities of those agencies with boating safety responsibilities. As the ratio of enforcement to total boat use declines, accidents would likely increase.

Some current and planned actions would improve the negative accident trend. The existing 600-foot no-wake zone established in 2001 is a very low speed limit for shoreline areas vulnerable to impacts related to increased density. The establishment of the 600-foot no-wake zone has resulted in an overall decrease in the number of spatial conflicts with differing types of marine craft (e.g., kayaks and canoes vs. power boats). Compliance with this standard relies solely on public education and the TRPA Watercraft Team, who are tasked with enforcing the no-wake zone. California, Nevada, and the Coast Guard are engaged in aggressive public boating safety education programs and expect these efforts to be effective in reducing overall accident rates. At least some of the projected watercraft usage increases involve rental craft, most of which are accompanied by safety information.

The agencies charged with the primary responsibility for boating safety typically rely on the strategy of public education and targeted enforcement to reduce accident rates. Increasing trends in accident statistics over the last 10-20 years do not demonstrate an obvious success with this strategy. However, public safety continues to be a high visibility issue and as accident rates continue to increase, improved enforcement is expected to follow.

**Emergency Access**

The likelihood of death or serious injury resulting from boating accidents can be reduced through adequate emergency access. This includes both access to accident sites by emergency vehicles or vessels, and emergency exit opportunities for watercraft in trouble. All of the project alternatives, with the exception of Alternative 5, allow additional public boat ramps. This increase could potentially benefit public safety by increasing the number of access points available to emergency vessels. However, increasing the number of boat ramps may not result in an increased number of exit points on the Lake (which would be desirable during severe weather), as a trailer is required to pull a vessel out of the Lake. Recreational boaters accessing the Lake via a boat ramp are effectively forced to exit at the same point from which the boat was launched. Only those boat ramps constructed in conjunction with a harbor and available mooring space afford a safe haven and an additional exit point for vessels threatened by severe weather. Existing regulations and topographic constraints limit the number of locations available for boat ramps. The effect of boat ramps on emergency access, therefore, is neutral for the most part.

**Navigational Hazards**

Navigational hazards result from placement of obstructions in the travel way. This can include new piers (particularly in areas currently without piers), extensions of existing piers, buoys, and Shorezone protection devices such as breakwaters. Navigational hazards increase boating accidents in two ways; watercraft can collide with the hazard itself or the hazard can decrease maneuvering room and cause two watercrafts to collide. In daylight hours, these hazards pose the greatest concern during adverse weather conditions when wind or waves can reduce a boater's control, resulting in no-fault accidents. Improper watercraft operation also increases the chance of collision with navigational hazards. During
the evening and nighttime hours, hazards associated with physical obstructions increase as few of them are lit. Nighttime watercraft operation risks collision with navigational hazards in adverse weather conditions and when they are not operated safely (e.g., excessive speed or inadequate lighting).

Some of the Shorezone development envisioned by the five alternatives offer little potential for impacts related to navigational hazards. In most cases, new private piers are surrounded by existing structures that have already dictated navigational patterns. Therefore, new piers constructed within the required setbacks and within the pierhead line that constitutes “in-fill” development rarely constitute a navigational hazard. Increased buoy density when placed within established buoy fields also avoids creating new hazards. The Coast Guard requires that all mooring buoy fields be lit at the lakeward corners. This requirement may be enforced as fields expand through permitting and potentially lowering the navigational hazard. Additionally, floating platforms are most common at multiple-use and public facilities and often incorporate a swimline, warning boaters to keep a safe distance and to avoid collisions with the structure, as well as swimmers. Proliferation of floating platforms on private property produce similar effects as buoys, noted below.

On the other hand, new or modified facilities (particularly piers and certain protective structures) that are allowed to significantly extend beyond the pierhead line represent a new navigational hazard with potential for impacts. New facilities, even if located within the pierhead line that lies in areas currently undeveloped (at least 1,000 feet from any adjacent structure) also represent a new hazard.

Due to their relatively smaller size and lower visibility compared to other structures, buoys installed in open waters, with few or no existing structures in the immediate area, create hazards for watercraft operators, particularly at night. When associated with piers, buoys are installed that much closer to navigation lanes. Impacts become greater if buoys are not maintained during fluctuating lake levels to avoid the float becoming submerged. Submerged buoys in any location may be struck by a vessel underway, and may cause injury to boaters. Properly maintained buoys situated in close proximity with existing structures, in most cases do not significantly impact navigation.

Existing fences that pose navigational hazards are prohibited. Implementation of any of the alternatives should not significantly affect the number of permitted fences below the high water line and, therefore, would not result in any significant impact on public health and safety.

**Source Water**

Chapter 5, Water Quality, identifies threats to public drinking sources resulting from increased boat use allowed by the alternatives. This threat is highest in Nevada as most of the water purveyors rely in part or in whole on Lake Tahoe water to meet public water supply needs. Please refer to Chapter 5 for a complete discussion of potential impacts to source water.

Table 15-8 summarizes impacts to public health and safety for each of the five alternatives.

<table>
<thead>
<tr>
<th>Table 15-8. Alternatives Comparison: Public Health and Safety</th>
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<tbody>
<tr>
<td>Navigation Hazards</td>
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<tr>
<td>--------------------</td>
</tr>
<tr>
<td>Alternative 1</td>
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<tr>
<td>Alternative 2</td>
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<tr>
<td>Alternative 3</td>
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<tr>
<td>Alternative 4</td>
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<tr>
<td>Alternative 5</td>
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</tbody>
</table>

NS = Non Significant Impact  S = Potentially Significant Impact  B = Beneficial Impact
15-5. SIGNIFICANT PUBLIC HEALTH AND SAFETY IMPACTS AND REQUIRED MITIGATION MEASURES

ALTERNATIVE 1 – NO PROJECT ALTERNATIVE

With the No Project Alternative TRPA would continue to review Shorezone projects under the current Code of Ordinances. This alternative would not allow new Shorezone structures in mapped or fields verified as fish spawning or feed and cover habitats, or within 200-feet of designated spawning streams. TRPA may permit new structures in marginal fish habitats.

The evaluation criteria described above provide the basis for determining the significance of impacts to public health and safety. The following impacts have been determined to be significant when evaluated against the specific criteria described.

15.1.1 Impact: The No Project Alternative could result in increased boating use and accidents.

Alternative 1 would increase the total annual boat trips from the 2004 estimate of 231,978 to an estimated 322,080 at full build out. Alternatives 2, 3, and 4 would produce more boat trips at the build out year, while Alternative 5 would produce fewer boat trips. As noted above, increased boat use would increase accidents, including increasing the risk of serious injury or fatalities. Of the total predicted boat trips in 2024, some of those would be rental craft, which would provide for increased opportunities for public education regarding safety issues. Existing public education and enforcement campaigns would need to be expanded to meet this projected increase.

With the increase in boating activity, spatial conflicts also would increase. This would occur most dramatically closer to public access points (where PWCs tend to congregate) and in popular shoreline areas. As spatial conflicts increase throughout the Region, many regular boaters would likely adjust use patterns (time of day and location) to avoid a decreased recreational experience. However, peak weekend periods would continue to experience increased boating density and an increased risk of accident. While these expansions could create increased densities at entrance/exit points, environmental documentation prepared during project development is required to consider specific site conditions, identify this risk, and mitigate it if necessary.

15.1.1a Mitigation Measure: In order to minimize the potential impacts caused by an increase in boating, TRPA shall coordinate with the California Boating and Waterways and Nevada Department of Wildlife to legislate a 600 foot no wake zone on Lake Tahoe with each state and to institute a Lake Tahoe boat sticker program which will fund additional law enforcement and water quality needs on Lake Tahoe.

Implementation of this mitigation measure would reduce this potential significant impact to a level that is less than significant

Non-Significant Public Health and Safety Impacts

The No Project Alternative could result in increased navigational hazards. This alternative would allow extensions to existing structures located outside of prime fish habitat, including pier extensions and additional buoy placement in existing buoy fields. It would assume continuance of the current TRPA practice of allowing pier extensions beyond the pierhead line to reach navigable water. As noted above, this type of pier extension can create a navigational hazard and, therefore, a safety risk. However, the Army Corps of Engineers
considers each extension application and must assert that, based on project details and site-specific conditions, the project would not create a navigational hazard. However, current Code standards require TRPA to find no adverse navigational hazards resulting from new Shorezone projects. As a result, no significant impacts to navigation are expected under this alternative.

**Beneficial Public Health and Safety Impacts**

No beneficial impacts have been identified for the No Project Alternative.

**ALTERNATIVE 2 – PROPOSED PROJECT ALTERNATIVE**

The Proposed Project would eliminate the prohibition on Shorezone structures located in prime fish habitat except for stream mouth setbacks. The TRPA *Code of Ordinances* would be revised based on the recommendations from the Shorezone Partnership Group, Shorezone Policy Committee, and the TRPA staff. The goal of Alternative 2 is to assure that: 1) all lakefront property owners are eligible to make an application for a pier and sufficient buoys to access Regional lakes; 2) all impacts can be mitigated; and 3) all applicable environmental thresholds would be attained.

**Significant Public Health and Safety Impacts**

15.2.1 Impact: The Proposed Project Alternative could result in increased boating use and accidents.

Use projections under Alternative 2 indicate an increase in the total number of annual boat trips from the 2004 estimate of 231,978 to an estimated 358,501 at full build out. As noted above, increased boat use would increase accidents, including increasing the risk of serious injury or fatalities.

The effects on public safety of increased boating use from this alternative are much the same as described for Alternative 1. Compared to Alternative 1, boating use would likely increase faster and peak at a higher number with implementation of Alternative 2. This raises the level of concern related to boating accidents and makes the success of existing educational and enforcement programs more fundamental to avoid significant impacts. State and local agencies with enforcement responsibilities would experience greater stresses on their resources sooner under this alternative. It would be necessary to obtain increased funding for public safety programs in order to meet increased enforcement responsibilities.

In order to mitigate potential accidents and fatalities, 15.1.1a Mitigation Measure presented above for 15.1.1 Impact shall be implemented.

Implementation of this mitigation measure would reduce this potential significant impact to a level that is less than significant.

**Non-Significant Public Health and Safety Impacts**

The Proposed Project Alternative could result in increased Navigation Hazards. This alternative would remove the fish prohibition limitations for new and expanded facilities in a large portion of the Lake Tahoe shoreline. This would result in new Shorezone facilities in areas currently undeveloped, increasing the reliance on the Code provisions related to navigational hazards to avoid creating significant impacts. Other features of the proposed ordinance would include the scenic point system and required scenic BMP’s that would be intended to encourage the smallest new piers possible to meet the need; and narrower, shorter piers would create fewer navigational obstacles.
The proposed ordinance would codify the current practice of allowing pier length extensions beyond the pierhead line in certain cases. As these structures can pose increased risk, reliance on the assessment of navigational hazards made by the Army Corps of Engineers prior to project approval would become crucial to avoid significant impacts to public safety. In the past, TRPA and Army Corps staffs have expressed the need to develop Tahoe-specific criteria for pier extensions that meet the statutory requirements of Section 10 of the Rivers and Harbors Act. As project application numbers and boating numbers increase, this need would increase as well. Developing these criteria could assist with the regional efforts at streamlining the project permitting process and would help minimize impacts to public health and safety. As a result, no significant impacts to navigation are expected under this alternative.

**Beneficial Public Health and Safety Impacts**

No beneficial impacts to public health and safety have been identified under the Proposed Project Alternative.

**ALTERNATIVE 3 – NO FISH HABITAT RESTRICTIONS ALTERNATIVE**

With Alternative 3, all provisions of the TRPA *Code of Ordinances* would still apply, although the prohibition on Shorezone structures located in prime fish habitat and stream mouth setbacks would be eliminated. Chapter 2 provides more details concerning this alternative.

**Significant Public Health and Safety Impacts**

15.3.1 Impact: The No Fish Habitat Restrictions Alternative could result in increased navigation hazards.

Alternative 3 would produce the greatest number of new structures and the largest increase in boat use of all the alternatives considered. The projected boat trips would increase from an estimated 231,978 in 2004, to 549,099 at full build out. All of the impacts assessed for the other alternatives would be greater should Alternative 3 be adopted. Alternative 3 would also result in an increase in boat use, which in turn would result in an increase of accidents and fatalities.

15.3.1 Mitigation Measure: In order to minimize the potential impacts caused by an increase in navigation hazards, TRPA shall coordinate with the Coast Guard and local emergency agencies to implement an advanced navigation avoidance safety plan for Lake Tahoe. This plan would identify potential impact areas. These areas could then be mapped on navigational charts and/or hazard buoys placed to warn boaters of potential navigation hazards.

15.3.2 Impact: The No Fish Habitat Restrictions Alternative could result in increased boating use and accidents.

Use projections under Alternative 2 indicate an increase in the total annual boat trips from the 2004 estimate of 231,978 to an estimated 549,099 at full build out. As noted above, increased boat use would increase accidents, including increasing the risk of serious injury or fatalities.

The effects on public safety of increased boating use from this alternative are much the same as described for Alternative 1. However, of all the Alternatives, boating use would likely increase the fastest under Alternative 3. This raises the level of concern related to boating accidents and makes the success of existing educational and enforcement programs more fundamental to avoid significant impacts. State and local agencies with enforcement responsibilities would experience greater stresses on their resources sooner.
under this alternative. It would be necessary to obtain increased funding for public safety programs in order to meet increased enforcement responsibilities.

In order to mitigate potential accidents and fatalities, 15.1.1a Mitigation Measure presented above for 15.1.1 Impact shall be implemented.

Implementation of these mitigation measures would reduce this potential significant impact to a level that is less than significant.

Non-Significant Public Health and Safety Impacts
There would be no non-significant impacts on wildlife with the No Fish Habitat Restrictions Alternative.

Beneficial Public Health and Safety Impacts
There would be no beneficial impacts with the No Fish Habitat Restrictions Alternative.

ALTERNATIVE 4 – PUBLIC STRUCTURES ONLY ALTERNATIVE

Alternative 4 would remove the prohibition on locating Shorezone structures in prime fish habitat, but would continue to prohibit the development of structures within 200-feet of stream mouths used for fish migration. Only structures that allow general public access would be permitted under this alternative. Chapter 2 provides more detail about this alternative.

Significant Public Health and Safety Impacts
15.4.1 Impact: The Public Structures Only Alternative could result in increased boating use and accidents.
Boating use numbers under Alternative 4 would be similar to those projected under Alternative 2, the preferred alternative. Boating use under this alternative would increase from 231,978 in 2004 to an estimated 317,390 at full build-out. Under this alternative, no new additional moorings would be included for private use because this alternative increases public mooring opportunities and assumes a higher use rate for boats moored at public slips or buoys. The impacts of increased boating related to boating accidents would be the same as those described for Alternative 2.

In order to mitigate potential accidents and fatalities, 15.1.1a Mitigation Measure presented above for 15.1.1 Impact shall be implemented.

Implementation of this mitigation measure would reduce this potential significant impact to a level that is less than significant.

Non-Significant Public Health and Safety Impacts
The Public Structures Only Alternative could result in increased navigation hazards. Alternative 4 would allow the same number of public facilities as the other alternatives, although as this alternative would limit other access to the Lake, it could hasten their construction. Larger public piers would be allowed under this alternative, potentially producing a greater navigational hazard compared to single use piers. However, public piers are usually illuminated at night, decreasing the chance they would contribute to an accident. Additionally, this alternative would limit the number of new structures, including those creating a navigational hazard (located more than 1,000 feet away from another structure). Overall, the limited number of new structures allowed under this alternative would greatly
reduce the potential for new navigational hazards. As a result, no significant impacts to navigation are expected under this alternative.

**Beneficial Public Health and Safety Impacts**
There would be no beneficial impacts with the Public Structures Only Alternative.

**ALTERNATIVE 5 – REDUCED DEVELOPMENT ALTERNATIVE**

Based on the Fish Study Recommendations, TRPA would remove the prohibition on locating structures in prime fish habitat. However, in order to mitigate existing and additional development this alternative would only allow new private multiple-use structures where there is a net reduction in total permitted structure numbers (2:1 reduction) and new public structures where there is no increase in total permitted structure numbers (1:1 reduction). The Proposed Ordinances for Alternative 2 would be adopted to support the Reduced Development Alternative.

**Significant Public Health and Safety Impacts**
No significant impacts to public health and safety have been identified for the Public Structures Only Alternative.

**Non-Significant Public Health and Safety Impacts**
The Reduced Development Alternative could result in increased boating use and accidents. Alternative 5 would substantially limit the number of Shorezone structures and would require the removal of some private, single-use piers. As a result, boating use under this alternative is actually projected to decrease from 231,978 in 2004 to an estimated 227,718 at full build-out. Under this alternative, no new private single use piers would be permitted and a greater emphasis on multi-use piers would occur, potentially producing a greater navigational hazard compared to single use piers. However, as with Alternative 4, these piers would be illuminated at night, thereby decreasing the chance they would contribute to an accident. Overall, the limited number of new structures allowed under this alternative, along with the required reduction ratio would greatly reduce the potential for new navigational hazards. As a result, no significant impacts to navigation are expected under this alternative.

**Beneficial Public Health and Safety Impacts**
The Reduced Development Alternative would result in a decrease of navigation hazards at Lake Tahoe. Alternative 5 would substantially limit the number of Shorezone structures and would actually require the removal of some private, single use piers as mitigation for construction of new multi-use piers. Additionally, boating use under this alternative is expected to decrease from estimated 2004 levels. Additionally, this alternative would rely on larger, multi-use piers. As described for Alternative 4, these larger piers are more likely to be illuminated at night, thereby decreasing the potential for them being a navigational hazard. This alternative would require the elimination of smaller, private piers, which are more likely to be navigational hazards, especially at night, thereby reducing the potential for collision. This would result in a beneficial impact to public health and safety.