Chapter 11
SOIL CONSERVATION

11.1 INTRODUCTION

This chapter identifies the potential environmental impacts on soil resources, littoral processes, and stream environment zones (SEZ) that could result from implementation of Alternative 6. The existing conditions of the project area with respect to soil conservation, littoral processes, and SEZ are described in Section 11.1 of the DEIS and are not repeated here. Please refer to the DEIS.

REGULATORY CONSIDERATIONS

This analysis of Alternative 6 uses the same established soil conservation regulatory considerations and impact criteria that were employed with the other alternatives. They are listed in Section 11.1 of the DEIS. Please refer to the DEIS.

11.2 EXISTING SOIL CONSERVATION, LITTORAL, AND SEZ CONDITIONS

Existing soil conservation, littoral, and SEZ conditions and trends for Lake Tahoe are the same for Alternative 6 as those presented in Section 11.2 of the DEIS for the five originally proposed alternatives. Refer to Section 11.2 of the DEIS.

11.3 SUMMARY OF PROJECT ALTERNATIVES – ALTERNATIVE 6

As discussed in Chapter 2 of the DEIS, the different alternatives would have varied effects on Shorezone development at Lake Tahoe. Section 11.3 of the DEIS contains a summary of the five originally proposed alternatives. Alternative 6 is summarized below.

ALTERNATIVE 6 – DENSITY-BASED, 230-PIER ALTERNATIVE

Alternative 6 implements a new approach to the authorization of pier construction, based on planned density of piers within specified shoreline types and a limited annual approval rate leading to no more than 220 private and 10 public (230 total) piers within the timeframe of the PATHWAY 2007 Regional Plan update (2027). Up to 10 new private piers may be approved each year. Under this alternative, all private parcels that do not have an existing pier or deed restrictions related to access to a multi-use pier would be potentially eligible for a pier. Eligibility criteria also require that existing shoreland structures achieve a scenic contrast rating score of 25 or better and that current Best Management Practices (BMPs) are in place, among other provisions. Also, only multi-use piers could be approved in shoreline travel units.
that have not attained scenic thresholds. Owners of eligible parcels may apply for a new single or multi-use pier, the approval of which would be determined by the length of shoreline retired by the approval (i.e., approval of a pier would retire the parcel or parcels with access to the pier from future eligibility and first priority would be assigned to applications with the greatest length of retired shoreline). All piers must comply with design standards adopted by TRPA to ensure that scenic code requirements and thresholds are met.

Up to two buoys would be allowed on every private littoral parcel, as long as they could meet adjacent property setback, shoreline distance, and separation standards. All buoys must be set back at least 25 feet from the adjacent property line, as measured from the line extended into the water. They must be located no more than 350 feet from the high water shoreline, or within the shorezone area defined by the 6,219-foot contour line on the lakebed where shallow water makes achievement of the 350-foot distance from the high water shoreline impossible. The minimum separation distance between buoys must be 50 feet.

At public marinas, in common areas controlled by homeowners associations (or similar entities), or on public properties where piers are allowed, the buoys must be located within the area defined by the side property setback and shoreline distance standards. The maximum number of buoys would be determined by these dimensions and the minimum separation distance of 50 feet. Also, buoy fields controlled by homeowners associations may not contain more buoys than the number of participating homes in the association.

Only public boat launching ramps could be constructed under Alternative 6. Therefore, they would only be added where public street access to the shoreline is present with shoreland area that is suitable for the launch ramp use and other mitigation (e.g., sewer and water connection).

SOIL CONSERVATION–RELATED PROJECT CHARACTERISTICS

Table 11-1 provides a summary of the main project features of the five originally proposed alternatives along with Alternative 6 and provides an overview of their differences.

<table>
<thead>
<tr>
<th>Project Features</th>
<th>Alternative 6 Density-based, 230-Pier</th>
<th>Alternative 1 No Project</th>
<th>Alternative 2 Proposed Project</th>
<th>Alternative 3 No Fish Habitat Restrictions</th>
<th>Alternative 4 Public Structures Only</th>
<th>Alternative 5 Reduced Development</th>
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11.4 STANDARDS OF SIGNIFICANCE

The scientific and analytical basis for the evaluation of the soil and SEZ impacts of Alternative 6 is the same as that used for the other alternatives and is not repeated here. Refer to Section 11.4 of the DEIS.

SUMMARY OF POTENTIAL IMPACTS

Potential direct and indirect effects are the same for Alternative 6 as those presented in Sections 11.4 and 11.5 of the DEIS for the other alternatives. Potential impacts include loss of SEZ, increase in land coverage, increased shorezone erosion, and disruption of littoral drift processes.

11.5 POTENTIAL SOIL CONSERVATION/SEZ IMPACTS AND REQUIRED MITIGATION MEASURES

ALTERNATIVE 6 – DENSITY-BASED, 230-PIER ALTERNATIVE

Alternative 6 implements a new approach to the approval and placement of a limited number of new piers in association with the timeframe of the PATHWAY 2007 Regional Plan (i.e., authorization ending in 2027). The approval of new piers would be directed by parcel eligibility and density criteria and would be implemented using a limited approval rate of up to 10 new private piers per year. All new piers and expansions would be required to comply with TRPA-adopted design standards to help ensure compliance with soil conservation and SEZ code and threshold requirements.

The impact analysis for Alternative 6 is based on the assumption this alternative includes, as Code amendments or required soil and vegetation resource protection measures, many of the mitigation measures described in the DEIS for other alternatives. Vegetation resource protection measures are described in Chapter 10, “Vegetation.” Soil protection measures include the following:

1) Adopt backshore setbacks and specific definition of area of instability until specific backshore boundary evaluation criteria have been established from an analysis of the various Shorezone erosion rates and the SEZ/Backshore maps are adopted.

2) Amend the Code’s restoration requirements to require that in-kind restoration occurs in the Shorezone at a restoration-to-disturbance ratio of 1.5:1 to prevent a net loss of SEZ in the Shorezone. A TRPA approved vegetation specialist will be required to be on site during any activities that could result in the loss of riparian vegetation. This expert would ensure that proper BMPs for avoiding the loss of riparian vegetation were followed. This specialist also would conduct post-construction inspections to ensure proper avoidance and/or restoration techniques were followed.

3) Implement a public outreach program geared specifically to the littoral property owner. The program shall inform littoral property owners about the merits of indigenous vegetation in the backshore and prohibitions against the cutting and
removal of SEZ vegetation, littoral processes, sensitivity of Beach (Be) soils, and different shoreline protection methods that meet the goals for the property owner and for the regulatory agencies. Update the TRPA plant list by adding a subsection to the list that specifically identifies appropriate species for the Shorezone.

4) Amend the Shorezone Tolerance District standards to show disturbance potential based on all geomorphic parameters, as described in Chapter 3.5, and add ordinances to limit construction activities to hand methods or specific types of small equipment in all Be soil areas. Implement priority soils/SEZ EIP projects identified in Appendix M of the DEIS, “Monitoring, Mitigation and Compliance Costs.”

5) Implement an incentive-based program that encourages and enables littoral property owners to relocate coverage out of the backshore to more stable upland areas; the program may include revisions to the excess coverage mitigation requirements to allow more credit for retirement of backshore coverage.

6) Adopt specific Shorezone BMPs that prohibit disruption of natural soil stratification in backshore areas that contain SEZ (including Be) soils.

7) Amend the Code to require a 3:1 coverage retirement requirement for new backshore SEZ (including Be soils) coverage/disturbance on properties where previously unmitigated excess land coverage exceeds one-percent. Allow the payment of a mitigation fee in-lieu of the removal of on-site excess coverage only if the total amount of remaining excess land coverage does not exceed 5-percent of the backshore. The mitigation fee should be equivalent to the cost of the acquisition and restoration of backshore SEZ three times the extent of the proposed new coverage/disturbance.

8) To offset significant Regional impacts to the Soil Conservation Thresholds/Littoral Process/SEZ standards from additional Shorezone development, and to ensure Soil Conservation Threshold attainment in the Region, TRPA shall draft and implement a mitigation fee program specific to Shorezone development. This mitigation fund shall be used to implement EIP soil conservation improvement projects with a Shorezone and/or lakezone emphasis. The mitigation fund would be set up to fund specific backshore restoration projects for Shorezone landforms (e.g., barrier beaches). For each additional development project that creates or maintains coverage in the backshore, the permittee shall remit a mitigation fee to be determined based on the cost of acquisition and restoration of an equivalent area of “in-kind” SEZ in the backshore. Amend the Code to reflect that the only mitigation for loss of sand dunes at Lake Tahoe is avoidance.

9) Amend the Code of Ordinances to reflect the requirement of using dynamic shoreline protection methods over static methods except for in very select case by case situations. This includes the preference for beach nourishment and by-pass dredging. Applicable BMPs are identified in Appendix E of the DEIS, “Proposed Code Amendment Changes.”

10) Amend the Code to prohibit floating piers that float along their full length (i.e., connecting the backshore and lakeward). Floating piers that extend from a static open pile section that connects to the backshore may be considered based on a site-by-site evaluation if there would be no disturbance to littoral transport.
**Direct and Indirect Impacts**

Alternative 6 is not expected to result in direct or indirect, significant adverse impacts on soil resources, because vegetation resource-protective requirements have been built into the facility review and approval process. A maximum of 230 new piers (220 private and 10 public), 1,862 new buoys, 6 new public ramps, 2 new floating docks, and 235 new slips could be constructed over the life of the Regional Plan update (2027) for this alternative. Alternative 6 could result in new structures and boat activity compared to other alternatives. Because development is related to additional land coverage and disturbance or loss of SEZs, Alternative 6 at full implementation, could have potentially negative impacts on soil resources and SEZs. However, this alternative includes gradual annual allowances, monitoring, and adaptive refinement of density criteria and design standards that are intended to ensure significant effects do not occur. Additionally, this alternative also includes soil and vegetation resource protection measures, as described above, that would assist in additional reduction of potential impacts. Implementation of the gradual/adaptive approach along with protection measures would reduce all potentially significant or significant impacts to less than significant levels.

**Impact 11.6.1: Development under Alternative 6 could result in the loss of SEZ and increased erosion.**

Alternative 6 could result in the loss of SEZ acreage from the construction of new access paths for up to 230 new piers and 6 new ramps. Loss of SEZ acreage could also occur when shoreline protective structures are constructed because of the removal of riparian vegetation and beach soils. The installation of 230 new piers, 1,862 new buoys, 6 new public ramps, 2 new floating docks, and 235 new slips would result in increased disturbance of SEZ (including Be soils) in the backshore associated with increased visitation to portions of the shoreline that are generally only accessible by boat. Various soil and vegetation protection measures are incorporated into Alternative 6 as project features, including adoption of backshore setbacks, requirement for in-kind restoration of SEZ at a restoration-to-disturbance ratio of 1.5:1, a public outreach program for littoral property owners about the merits of indigenous vegetation in the backshore, limitations of construction activities to hand methods or specific types of small equipment in all Be soil areas, an incentive-based program for littoral property owners to relocate coverage out of the backshore to more stable upland areas, and Shorezone BMPs that prohibit disruption of natural soil stratification in backshore areas that contain SEZ (including Be) soils. In addition, property owners would be required to consolidate multiple access routes from the backshore into one pathway, with BMPs in place, to access new structures and the beach; this would help ensure that new coverage through the backshore would not increase substantially.

These measures would help ensure that impacts of Alternative 6 on SEZ and soil erosion are less than significant.

**No mitigation measures would be required for Impact 11.6.1.**

**Impact 11.6.2: Development of structures in the Shorezone could result in excessive land coverage.**

Additional land coverage under Alternative 6 would result from the creation of new access paths in the backshore for the new piers, ramps, and floating docks. Under the existing TRPA Codes to mitigate excessive land coverage within the backshore, the excess coverage mitigation fees would be insufficient to adequately fund coverage removal and
restoration projects within the backshore at a level that would bring the backshore into compliance with the 1 percent coverage requirement within the foreseeable future. However, Alternative 6 incorporates soil and vegetation protection measures such as adoption of backshore setbacks, a public outreach program about the merits of indigenous vegetation in the backshore, limitations of construction activities to hand methods or specific types of small equipment in all Be soil areas, incentives to relocate coverage out of the backshore to more stable upland areas, BMPs that prohibit disruption of natural soil stratification in backshore areas that contain SEZ (including Be) soils, and a 3:1 coverage retirement requirement for new backshore SEZ (including Be soils) coverage/disturbance on properties where previously unmitigated excess land coverage exceeds 1 percent. In addition, property owners would be required to consolidate multiple access routes from the backshore into one pathway, with BMPs in place, to access new structures and the beach; this would help ensure that new coverage through the backshore would not increase substantially.

These measures would help ensure that impacts of Alternative 6 on excessive land coverage are less than significant.

No mitigation measures would be required for Impact 11.6.2.

Impact 11.6.3: Under Alternative 6, conditions could continue that have resulted in inadequate delineation of unstable backshore area.

Alternative 6 could continue the existing process for delineation of backshore areas that cannot adequately establish the true area of instability. This would permit development to encroach into areas that would become unstable through the natural processes of beach replenishment and the accelerated erosion potential of increased human use of the Shorezone. The long-term effects of relying on such a system would increase shoreline erosion and endanger elements of the built environment. Additionally, this would violate TRPA Code and Goals and Policies that prohibit shoreline erosion and modification, creating a significant impact on soils/SEZ. Alternative 6 includes as project features soil and vegetation protection measures such as adoption of backshore setbacks and specific definition of area of instability and implementation of a mitigation fee program to implement EIP soil conservation improvement projects.

These protection measures would help ensure that impacts of Alternative 6 on unstable backshore areas are less than significant.

No mitigation measures would be required for Impact 11.6.3.

Impact 11.6.4: Alternative 6 would result in construction of additional shoreline protective structures/retaining walls.

Construction of traditionally static shoreline protective structures would result in a loss of foreshore material. Such construction would not conform to the TRPA Code and Goals and Policies prohibiting shoreline erosion and modification. Protective measures incorporated into Alternative 6 as project features include using dynamic shoreline protection methods over static methods and revising the Shorezone BMP standards to reflect the requirement of utilizing dynamic shoreline protection methods, including wider setbacks, over static methods.

These protection measures would help ensure that impacts of Alternative 6 on shoreline protective measures are less than significant.
No mitigation measures would be required for Impact 11.6.4.

Impact 11.6.5: Development of structures under Alternative 6 could result in continued and additional disruption to littoral drift processes along the Shorezone.

Under Alternative 6, existing structures that adversely affect littoral transport could continue to influence littoral processes in the Shorezone. In addition, new structures such as floating piers and static backshore revetments may continue to be approved, further affecting the littoral drift processes in the Shorezone. Protection measures incorporated into Alternative 6 as project features include a mitigation fee program to implement EIP soil conservation improvement projects with a Shorezone and/or lakezone emphasis; the requirement to use dynamic shoreline protection methods over static methods; revisions to the Shorezone BMP standards to reflect that requirement; prohibition of floating piers that float along their full length (i.e., connecting the backshore and lakeward) or if natural littoral processes would be disturbed.

These protection measures would help ensure that impacts of Alternative 6 on littoral drift processes are less than significant.

No mitigation measures would be required for Impact 11.6.5.

Other Non-Significant Soil Conservation Impacts

Alternative 6 would rely on existing Code provisions and proposed Code amendments to avoid other potential soil conservation impacts. These include:

- amendments to Code provisions to establish preference for use of dynamic Shorezone protective structures and setbacks to avoid increased shoreline erosion;
- prohibition on alteration to vegetation in the Shorezone avoids modification to the protective qualities of the foreshore and avoids accelerated backshore erosion;
- requirements for maintaining drainage facilities avoids Shorezone erosion from concentrated discharges;
- requirements for BMP installation on all disturbed areas avoids increase in the level of disturbance found in the backshore resulting from all alternatives; and
- requirements for breakwaters and rock crib piers that prohibit resulting shoreline alteration avoid creating off site erosion and deposition impacts.

Beneficial Soil Conservation Impacts

There would be no beneficial impacts to soils as a result of Alternative 6.