**California Envirothon**

Current Issue Scenario: Rehabilitating Lake Tranquility

**Background**

Lake Tranquility is located high in the Sierra Nevada Range, east of the city of Fresno. Its waters are known for its remarkable turquoise blue clarity ringed by stunning snow-capped peaks towering 8,000 to 11,000 above sea level. It is one of the deepest, largest, and clearest lakes in the state. The Lake Tranquility Basin includes the City of Hope and portions Fresno and Inyo counties.

Lake Tranquility is recognized nationally as a natural resource of special significance because of its scenic and ecological values. It offers challenging alpine sports, biking, camping, hiking and leisure to millions of visitors each year. Lake Tranquility significantly contributes to the economies of the state and the nation. The communities and the economy of the Lake Tranquility Basin depend on its protection and restoration of its natural beauty and diverse recreational opportunities.

Approximately 40% of the basin is a national forest managed by the U.S. Forest Service. The basin contains a wide diversity of vegetation, ranging from subalpine to alpine meadow, coniferous forests and woodlands, riparian forests, shrub lands and various wetland communities. The typical northern Sierra Nevada tree species, such as lodgepole pine, red fir, white fir, incense cedar and Jeffrey Pine are present, but the balance of species has changed in the last century as the vast majority of the originally dominant sugar pine, Jeffrey pine and white fir forests were largely clear-cut around the turn of the 20th century. The forest is being managed to control the build up of fuels which left unmanaged could result in catastrophic wildfire. The U.S. Forest Service has established a program for thinning the forest and burning slash debris piles under appropriate conditions.

Native fisheries include mountain whitefish, golden trout and many other varieties. Many of these are largely locally extinct and numerous of other trout species have been introduced.

The ensuing building boom in the 1960s caused massive disturbance to the lake. Highways were constructed to accommodate the tourist industry and transportation east over the Sierra Nevada. Commercial and private development boomed creating residential subdivisions, private estates, hotels, ski resorts, campgrounds, restaurants, and housing for workers supporting the flourishing recreation business

Today however, the Lake Tranquility Basin continues to be threatened by the impacts of land use (e.g., urbanization) and transportation patterns developed in the last century have impaired the fragile watershed. The water clarity has declined and rate of decline continues to increase. The health of the watershed suffers degradation due to excess levels of fine sediment and nutrients from urban stormwater runoff; the destruction and alteration of wetlands; the legacy of over a century of fire suppression and periodic drought; the loss of biodiversity; and the threat and establishment of aquatic and terrestrial invasive species. Development has resulted in the loss of riparian habitat, physically disturbed watersheds, and increased the levels of sediment and nutrients to lake resulting in visible algal blooms and loss of clarity. Moreover, changes in average water temperature which is on the rise and a decrease in the percent of precipitation that falls as snow has been attributed to climate change, and calls upon local, state, and federal agencies to firmly assert its authorities and responsibilities to accelerate actions to protect and rehabilitate Lake Tranquility’s vigor and its sustainability for future generations.

**Scenario**

In accordance with the federal Clean Water Act, Lake Tranquility was identified by the local regional water board as a polluted water body. Its listing is based on research and science and water quality monitoring data that makes apparent the high levels of sediment and nutrients exceeding water quality objectives set forth by the board. This pollution threatens the safety of the communities’ drinking water, harms aquatic life, and diminishes recreation. The core of the local economy is tourism.

The source of these pollutants is primarily stormwater runoff from roadways, existing commercial and residential development, and construction, exacerbated by the loss of wetlands and riparian habitat. The local regional water has developed a total maximum daily load (TMDL) to establish a sediment and nutrient budget for the lake. This will mean local authorities will be required to reduce these pollutant loadings of sediment and nutrients to the lake by implementing a variety of actions and best management practices to improve water quality.

The Lake Tranquility Regional Planning Agency (LTRPA), responsible for overseeing the protection and restoration of the lake and its values, is now considering an implementation plan and potentially new regulations to manage and prevent stormwater pollution.

The LTRPA is considering the concept of low impact development (LID) to address stormwater through use of a system of techniques that minimize or altogether eliminate the amount of runoff generated by capturing rainwater for use and/or infiltration, thereby limiting the amount of polluted stormwater flowing untreated into creeks tributary to Lake Tranquility or directly to the lake. They are also looking at the possibility of urban redevelopment and the retrofitting of commercial buildings (e.g., motels) built since the 1960s, which created extensive corridors and swaths of impervious surfacing (e.g., parking lots). This kind of development altered drainage patterns and increased the volume of stormwater and its velocity. They further recognize that private residences must be part of the solution as rooftops, driveways, and landscaping contribute polluted runoff. Another major source of sediment and nutrients are the roads and highways in the basin and the need to reduce this polluted stormwater runoff.

As a progressive board, they wish to take more of an environmental stewardship approach but are uncertain of the costs and whether to make such an investment, how realistic and achievable is LID, how to address barriers to LID (e.g., who bears the costs and responsibility or has authority; does it have a proven track record), and how to achieve the support and buy in from the public, businesses, and local government. Moreover, with climate change, the LTRPA is concerned over the variable rain and snowfall and the consequences of extreme weather to flooding and peak storm events.