

## What are the conditions in the Mud Bay Sub-watershed?

### Current conditions

Approximately eleven percent of the Mud Bay Sub-watershed is covered by urban land uses (see Figure 61 and 61a. Classification Percent Totals for Mud Bay Sub-watershed). Mud Bay has a drainage area of 3.7 square miles.

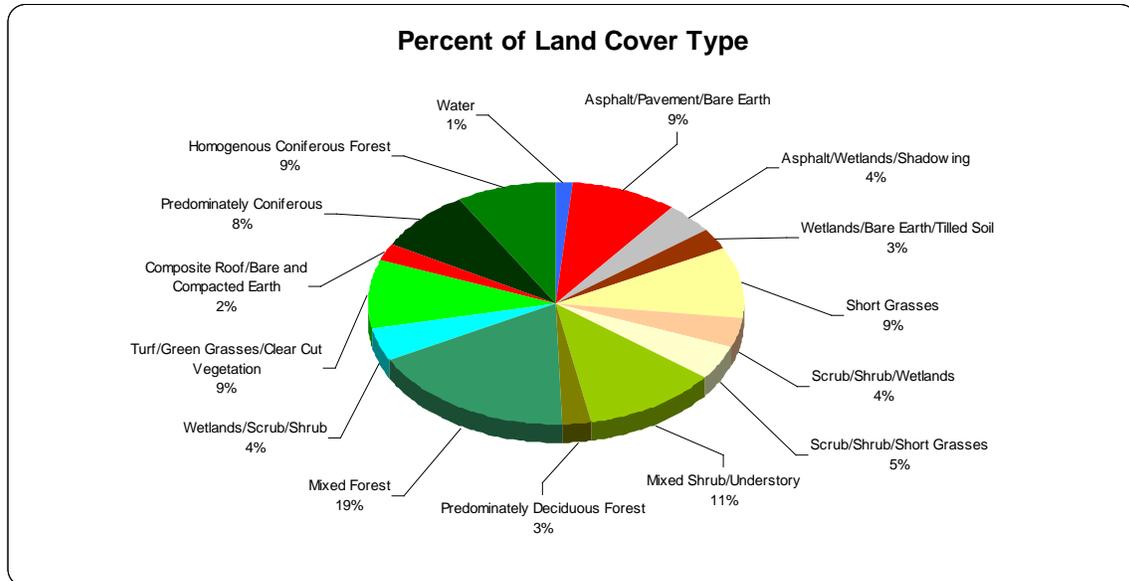


Figure 61a. Classification Percent Totals for Mud Bay Sub-watershed

Land cover data from 2005 SPOT imagery.

### Human alteration to the movement of water

The effects of human land use on the natural delivery of water to the Mud Bay and its tributaries in the Mud Bay Sub-watershed were characterized using the following landscape attributes: percent TIA, percent forest land, and percent wetland cover at the DAU scale. Results indicate that the Mud Bay Sub-watershed is in an “at risk” condition for the delivery of water, with two DAUs “not properly functioning.”

### Human alteration to the natural movement of sediment

The effects of human land use on the natural delivery of sediment to the Mud Bay and its tributaries in the Kennedy Creek Sub-watershed were characterized using the following landscape attributes: percent bare soils, road density, and percent unstable slopes at the DAU scale. The result is a “properly functioning” and “at risk” condition for sediment.

## **Human alteration to the natural movement of large wood**

The effects of human land use on the natural delivery and routing of large wood in the Mud Bay and its tributaries were characterized using the following landscape attributes: percent forested riparian and average number of stream crossings per kilometer of stream at the DAU scale. Results indicate that the Mud Bay Sub-watershed is primarily in a “not properly functioning” and “at risk” condition for the delivery and routing of large wood. Exceptions include two “properly functioning” DAUs.

## **Human alteration to the natural movement of pollutants**

The effects of human land use on the natural delivery and routing of pollutants in the Mud Bay and its tributaries were characterized using the following landscape attributes: Extent of 303(d) listed water bodies for nutrients, toxicants, and bacteria and condition and extent of wetlands at the DAU scale. There is no data to rank pollutants.

## **Human alteration to the natural movement of heat**

The effects of human land use on the natural delivery and routing of heat in the Mud Bay tributaries were characterized using the following landscape attributes: Extent of 303(d) listed water bodies for nutrients, toxicants, and bacteria, percent 67 meter riparian zone with mature canopy, road density, and percent TIA at the DAU scale. Results indicate that the Mud Bay Sub-watershed is primarily in an “at risk” condition for the delivery and routing of heat. The exception is one DAU that is “properly functioning.”

## **Aquatic integrity**

The effects of human land use on aquatic integrity in the Mud Bay and its tributaries in the Mud Bay Sub-watershed were characterized using the following landscape attributes: percent riparian forest, percent TIA, and available B-IBI scores at the DAU scale. There is no data to rank aquatic integrity.

## **Habitat Connectivity**

Forest covers thirty-four percent of the Mud Bay Sub-watershed. The Mud Bay Sub-watershed is considered “at risk” for habitat connectivity.

## **Ecological Benefit**

All DAUs within the study area having ecological and biological processes that are considered “at risk” under current land use conditions were identified for further consideration. DAUs in the “at risk” category for multiple key ecological and biological processes are assumed to provide the greatest potential to maximize environmental benefits when restored. The process scores are then ranked according to the weight criteria, and converted to a high, medium, or low process rank. Mud Bay has primarily high and moderate ecological benefit, with only three DAUs ranked as low (Figure 62. Mud Bay Sub-watershed Weighted Processes).

## Environmental Benefit

Once all the DAUs were ranked for their ecological benefit, all natural resource sites were ranked for their environmental benefit. Only the high and medium scoring sites were used in further evaluation to develop natural resource, fish habitat, and stormwater preservation and restoration sites.

**Table 17. Mud Bay Environmental Benefit Ranking of Natural Resource Sites**

Mud Bay Potential Restoration Sites				
Rank	Wetland	Riparian	Floodplain	Total
High	1	0	NA	1
Medium	2	7	NA	9
Low	10	13	NA	23

The following wetlands, riparian and floodplain sections describe the environmental benefit ranking of the natural resource sites.

### Wetlands

Prior to human alteration, wetlands in the Mud Bay Sub-watershed totaled approximately 487 acres. We estimate that approximately 370 acres are currently wetlands or degraded/destroyed wetlands with some restoration potential. (Figure 63. Mud Bay Sub-Watershed Resource Sites).

### Riparian condition

Development has encroached on approximately 91 acres of the 67-meter wide riparian corridors in the Mud Bay sub-watershed. Of the 202 acres, approximately 91 acres have some restoration potential (Figure 63. Mud Bay Sub-Watershed Resource Sites).

### Floodplain Condition

There is no regulated floodplain in the Mud Bay sub-watershed.

### Natural Resource Sites

All potential natural resource sites were evaluated for their environmental benefit and ranked high, medium, or low. Following evaluation, a total of 10 sites were of high or medium environmental benefit (Figure 64. Mud Bay Ecological Processes and Resource Site Scoring).

### Fish Habitat

There were 20 sites evaluated for habitat value to salmonid fish species. These sites were then used to evaluate potential natural resource sites that have the potential to be stormwater retrofits sites. While the goal is to use natural resource sites as stormwater retrofit sites, we don't want to compromise high quality fish habitat sites.

## **Stormwater Retrofit**

All the natural resource sites were evaluated for stormwater retrofit sites (Figure 65. Mud Bay Potential Stormwater Restoration Sites).

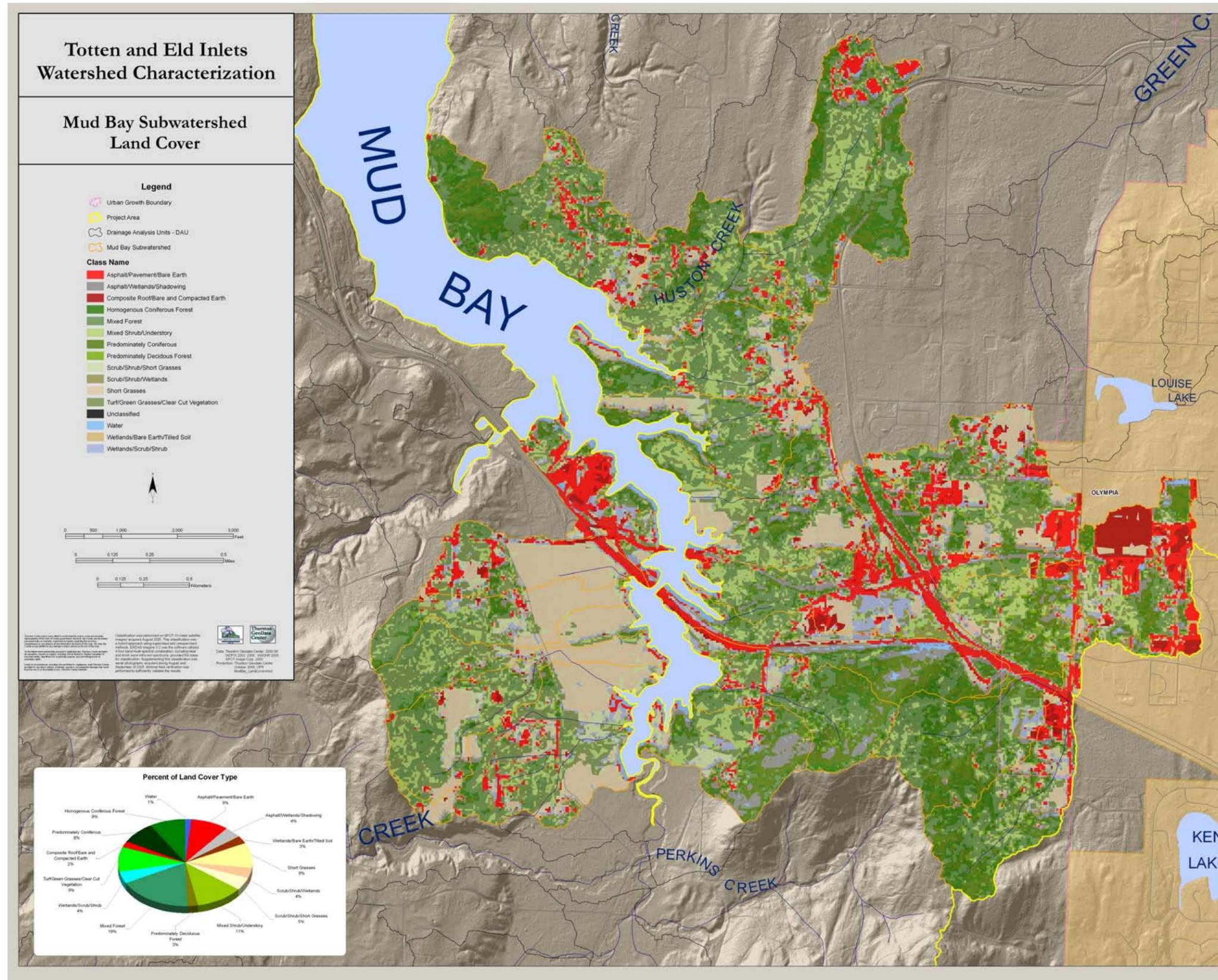


Figure 61 Mud Bay Sub-watershed Land Cover

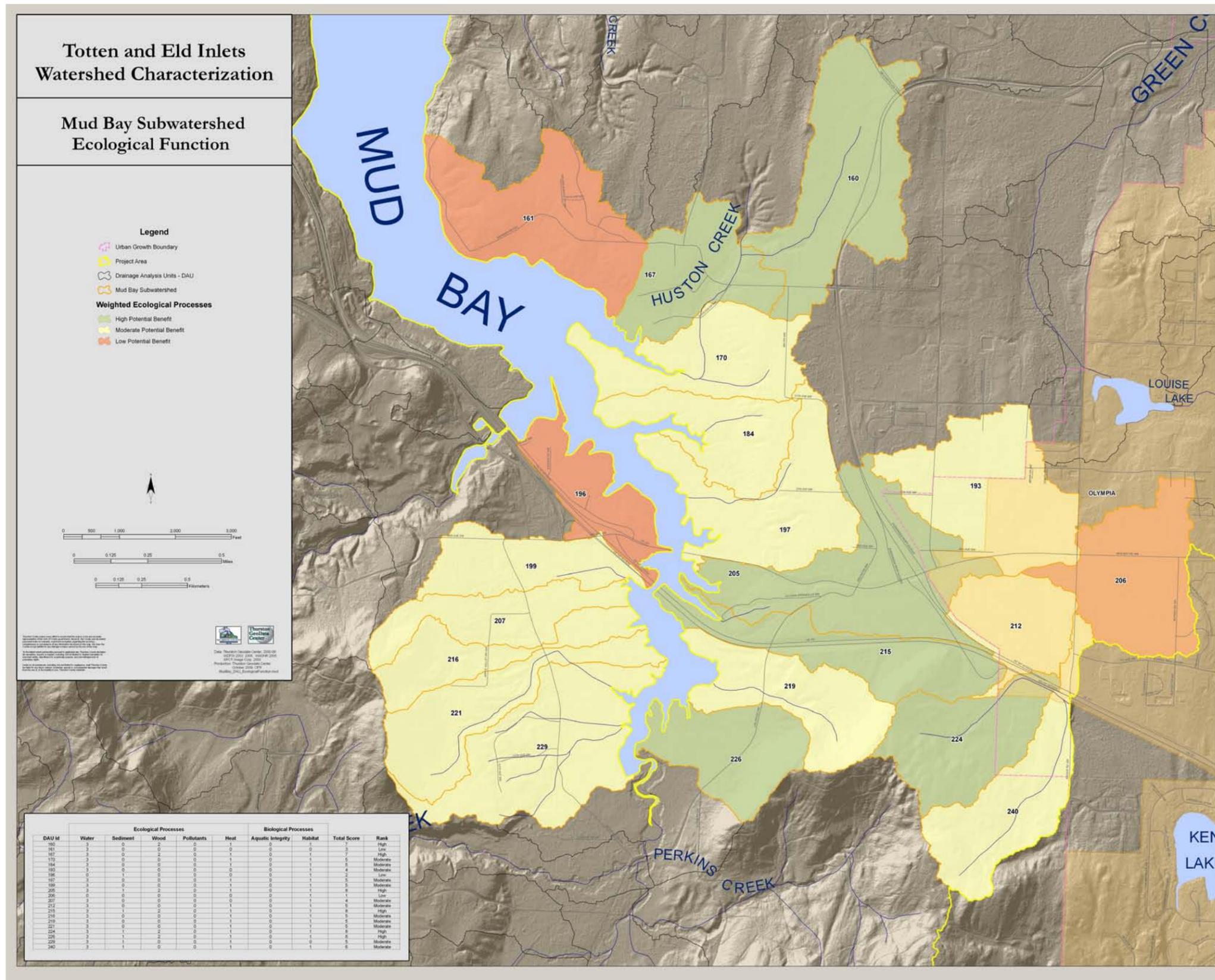


Figure 62 Mud Bay Sub-watershed Weighted Processes

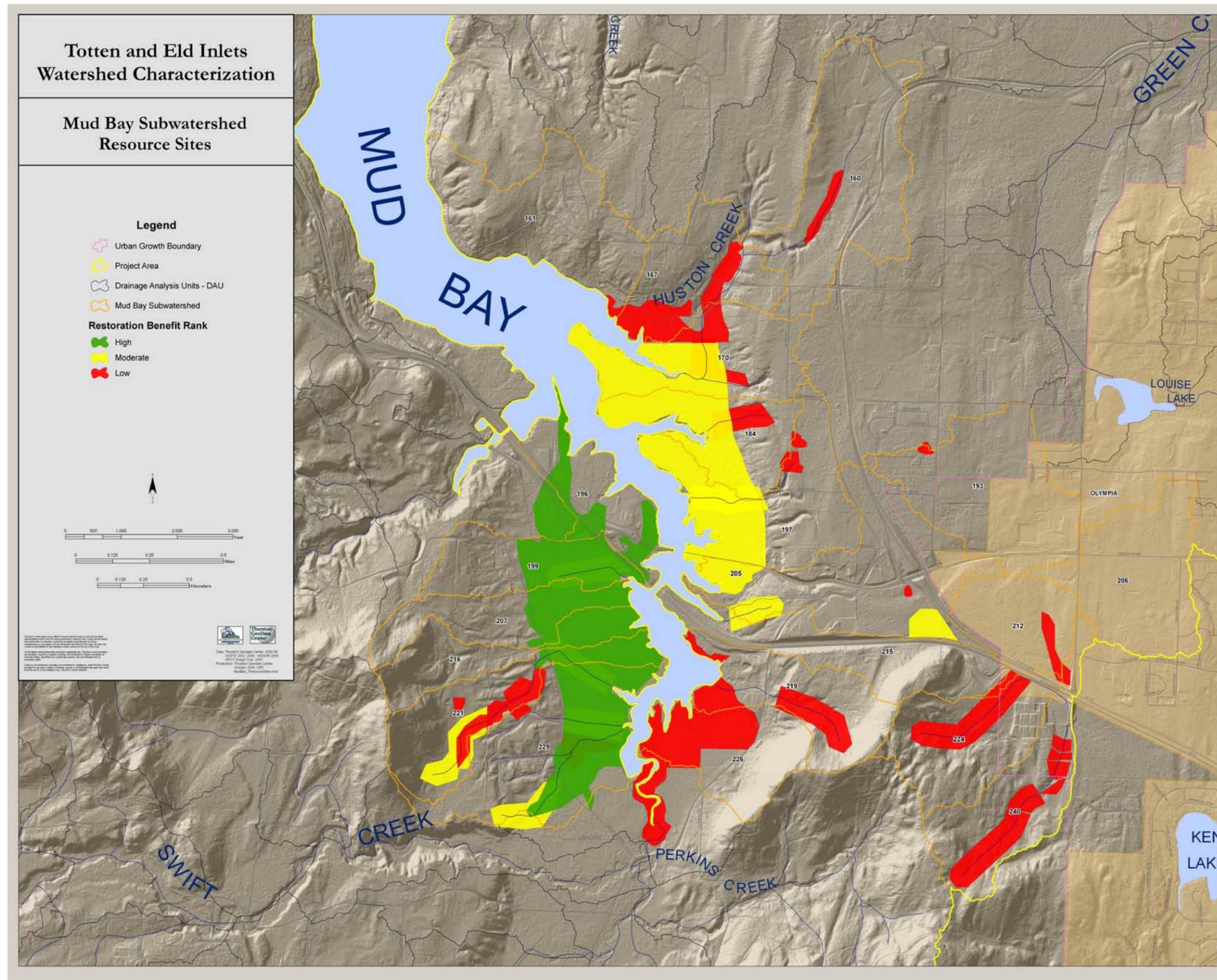


Figure 63 Mud Bay Sub-watershed Resource Sites

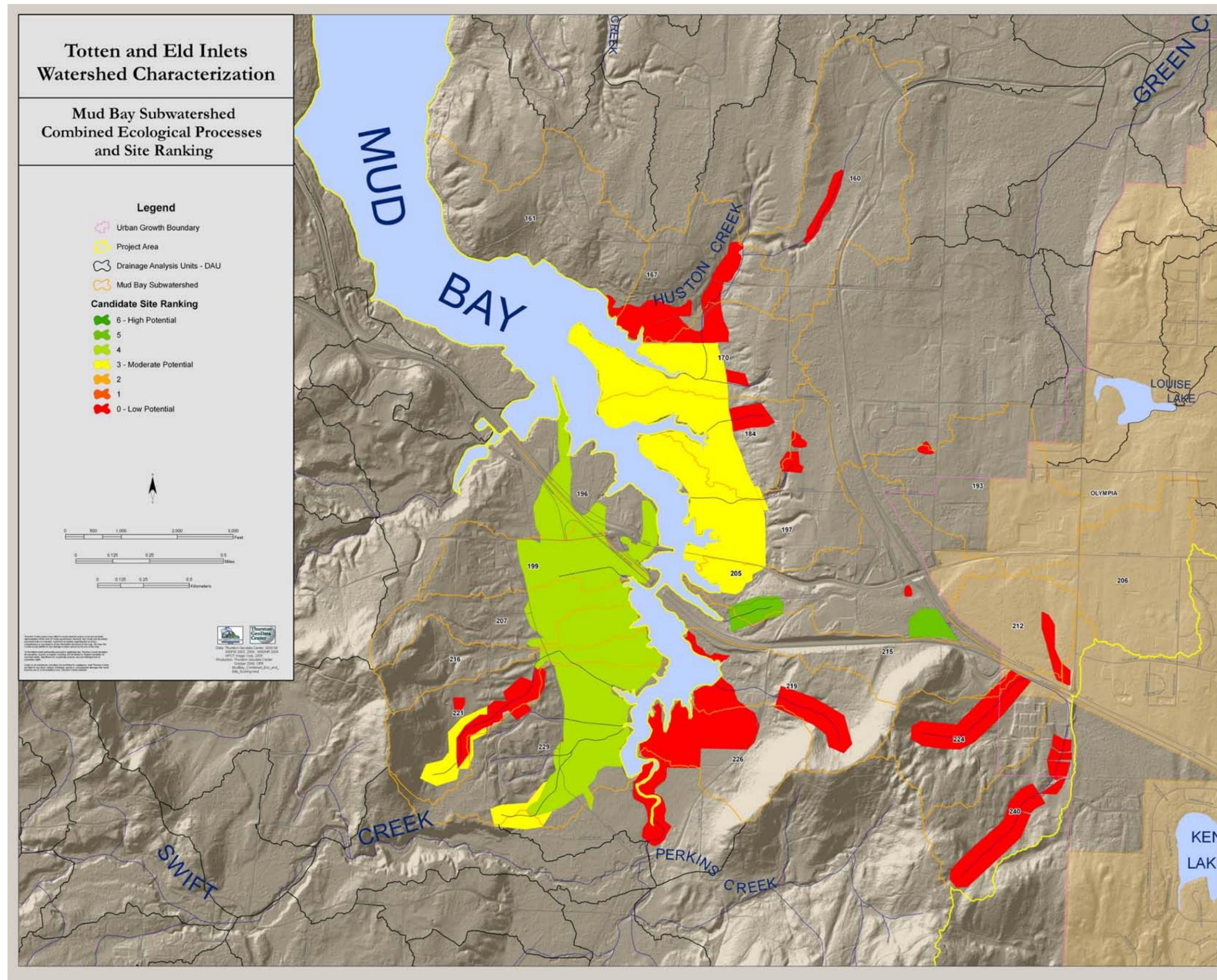


Figure 64 Mud Bay Sub-watershed Ecological Processes and Resource Site Scoring

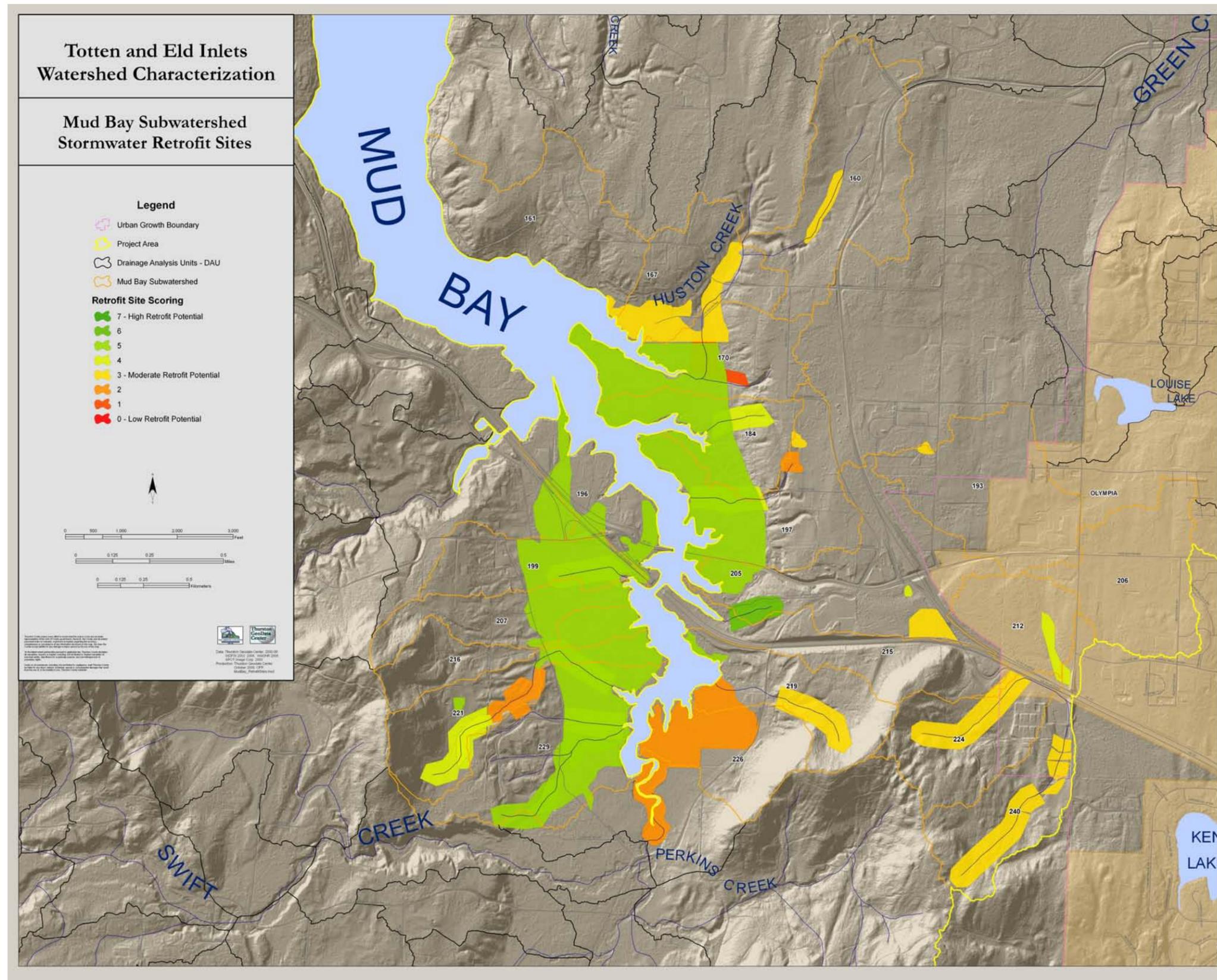


Figure 65 Mud Bay Sub-watershed Retrofit Sites