City of Medical Lake
Shoreline Master Program Document

Shoreline Restoration Plan:

For the City of Medical Lake's Jurisdictional Shorelines: Medical Lake

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MEDICAL LAKE RESTORATION PLAN

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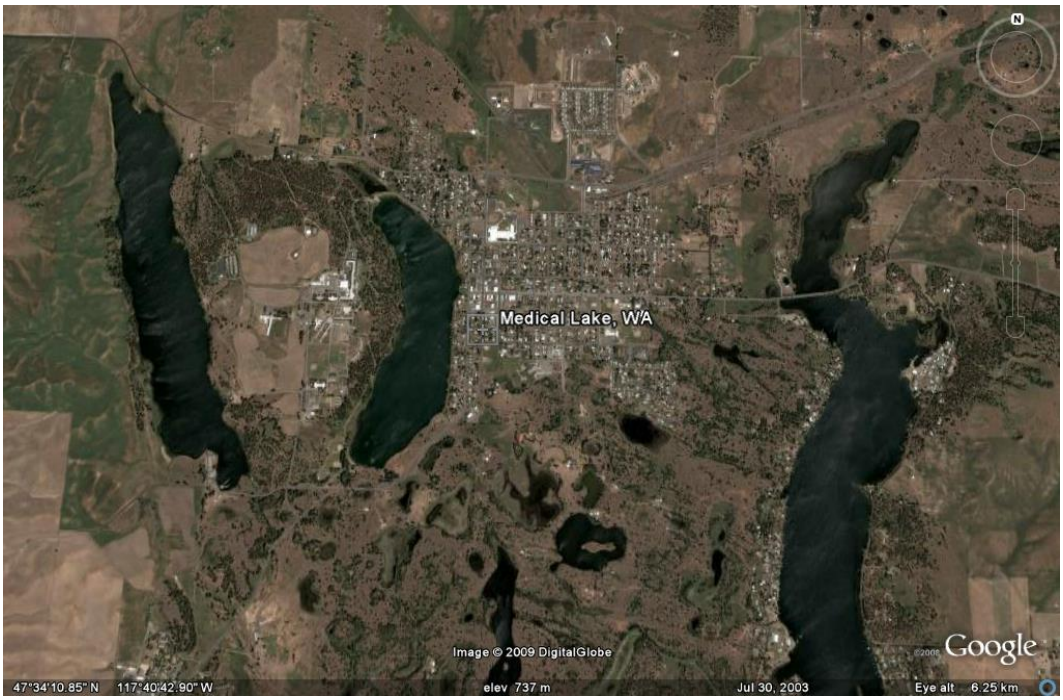
Medical Lake Jurisdictional Waters
Shoreline Restoration Plan

1.0 INTRODUCTION

In the first lines of the "Shoreline Management Act (SMA)" The Washington State Legislature found "*that the shorelines of the state are amongst the most valuable and fragile of its natural resources and that there is great concern throughout the state relating to their utilization, protection, restoration and preservation.*"

Incorporated in 1890, The City of Medical Lake's history is closely tied to the natural features of the area and is graced with an abundance of natural resources. Located on the border of what is known as the "Channeled Scablands" the Medical Lake area lies in a low relief setting with elevations ranging from 2,949 feet at the top of Booth Hill to 2,340 feet at the surface of Clear Lake in a location within Spokane County's West Plains. Rock formations, the water cycle, plants, and wildlife are all aspects of the micro-region. The landscape is scattered with sizeable recreational lakes and their ecosystems where former plunge-pools created by the Betz Flood, have filled with water.

Figure 1, Jurisdictional Shorelines
Medical Lake, West Medical Lake and Silver Lake



Within the jurisdictional boundary of the City of Medical Lake are three (3) such lakes, Medical Lake, West Medical Lake, and Silver Lake (Figure 1). Activities that occur in the 200-foot shoreline jurisdiction zone, on portions of Silver and West Medical Lakes and all of Medical Lake, fall within the jurisdiction of the Medical Lake Shoreline Master Program (SMP) and are subject to the policies of this plan. Activities that have adverse effects on the ecological functions and values of the shoreline must be mitigated. By law, the proponent of that activity is required to return the subject

shoreline to a condition equivalent to the baseline level at the time the activity takes place. It is understood that some uses and developments cannot always be mitigated fully, resulting in incremental and unavoidable degradation of the baseline condition. The question then is how can shoreline processes and functions be protected when the baseline condition is incrementally degraded over time? The answer is, "restoration."

Section 173-26-201(2)(f) of the Shoreline Master Program Guidelines states that:

> "Master programs shall include goals and policies that provide for restoration of such impaired ecological functions. These master program provisions shall identify existing policies and programs that contribute to planned restoration goals and identify any additional policies and programs that local government will implement to achieve its goals. These master program elements regarding restoration should make real and meaningful use of established or funded nonregulatory policies and programs that contribute to restoration of ecological functions and should appropriately consider the direct or indirect effects of other regulatory or nonregulatory programs under other local, state, and federal laws, as well as any restoration effects that may flow indirectly from shoreline development regulations and mitigation standards."

The guidelines define restoration as, "The establishment or upgrading of impaired ecological shoreline processes or functions…accomplished through measures including, but not limited to, revegetation, removal of intrusive shoreline structures and removal or treatment of toxic materials. Restoration does not imply a requirement for returning the shoreline area to original pre-European settlement conditions."

The restoration opportunities identified in this plan are focused primarily on publically owned open spaces and natural areas. There are, however, many other restoration opportunities along the shorelines on private property. These opportunities would be similar to those available on public lands, but would occur only through voluntary means.

1.1 Water Quantity and Quality

Medical Lake. Medical Lake has over 3.14 miles of shoreline, with a surface area of 160 acres, an average depth of 32 feet, and a drainage area of about 1.31 square miles. No visible surface inlets or outlets are shown on the Medical Lake, WA 7.5' quadrangle. Measurements since 1924 suggest that Medical Lake is naturally euotrophic. High fecal coliform bacteria concentrations at a city park on the north end of the lake are likely linked to the large goose population in the area.

1.2 Land Use and Land Cover

Medical Lake is bound by the City of Medical Lake on its northern and eastern shores. Single-family residences are the most common land use along this portion of the shoreline. The south and west shores are largely undeveloped other than a regional park at the south end and a walking/biking trail that circles the lake. The western shoreline borders state land on which the Eastern State Hospital complex sits atop the hill that separates West Medical Lake from Medical Lake. Medical Lake is a popular lake for fishing and swimming, and is also extensively used by waterfowl. Residential development activities along the eastern shores may effect the quality of freshwater habitat through removal of upland and wetland vegetation and increasing silt, organic debris and other stormwater contaminates that enter the natural drainage system. The greatest risk to the habitat is the conversion of the shoreline to residential uses, including the removal of riparian vegetation. In addition,

stabilization methods such as shore protection structures (i.e. bulkheads, docks, and boat ramps) often associated with residential development disconnect the critical ecological linkages between the water and the land environments.

Due to the geological history and resulting lack of define drainages, the region surrounding the lake is made up of small lakes and ponds as well as wetlands. Many of these lakes and wetlands are classified as priority wetland habitats, especially for waterfowl concentrations immediately south of the city.

The topography along the city's waterfront varies widely from shallow, low-gradient shorelines around the city's western, northern, and northeastern shores to a steeper-gradient shoreline along the southeastern portion of the city's waterfront. As a management tool, WAC 173-26-211 requires city master programs to contain a system to classify shoreline areas into six specific environmental designations based on existing land use patterns and the biological and physical character of the shoreline. These environmental designations are: "high intensity," "shoreline residential," "urban conservancy," "rural conservancy," "natural," and "aquatic," of which, Medical Lake has three: natural, urban conservancy and shoreline residential. These environmental designations act as a tool for local governments for applying and tailoring the general guidelines of the Shoreline Management Act to local shorelines. Because segments of shorelines are distinctively different each environmental designation, assigned to a shoreline segment, has management policies tailored to the uses that are permitted in that particular shoreline segment. A "Natural" environmental designation is assigned to the western shoreline of Medical Lake which abuts state land and remains in its natural state. No disruption to the shoreline and the landward acreage to the west have occurred, with the exception for a portion of the Medical Lake trail. A majority of the eastern shoreline is designated "Shoreline Residential" and has little to no acreage left for development. Single-family dwelling units comprise a majority of the land use except for a small city park located along the shoreline in the Central Business District of the downtown. The north and a portion of the northeastern shoreline, as well as the south and portions of the southeastern shoreline have assigned an "Urban Conservancy" environmental designation which allows recreational use of the shorelines. North End Park, Peper Park and Waterfront Park are located in the Urban Conservancy sections of the shoreline.

Medical lake has an emergent wetland complex at the north end and along the west bank. The shorelines of the lake have both lacustrine and palustrine emergent wetland complexes and are highly functional under the current conditions. Based on aerial photographs and prior assessment determinations, it appears that the wetland complexes are relatively diverse and functioning, and should be maintained as a priority. These wetlands are considered to be environmentally sensitive and are listed as a critical area. Critical areas are regulated via the City's Critical Areas Ordinance which is based upon "Best Available Science" and provides protection to critical areas in the city. Little to no disturbances is permitted as a "no net loss" policy is strictly enforced. The undeveloped areas of the shoreline have vegetation connectivity which allows for

shoreline stability, water storage, and provides for the filtration of sediments. Connectivity also provides protection for these wetland systems. Areas of the shoreline where development has occurred, and has little to no vegetative connectivity are experiencing signs of bank instability and advanced erosion. Shoreline erosion has been documented in some areas of the eastern and southern shorelines where unfinished step construction has left the banks striped of its vegetation and the soil laid open to the elements. Also, modifications to accommodate residential and recreational activities have changed the landscape and the shoreline frontage where those activities have taken place.

1.3 City Efforts

Besides the assessment and evaluation of the city's shorelines performed by city staff and a volunteer group of concerned shoreline property owners, the Shoreline Inventory and Characterization Draft, done in 2005 by the Department of Geography and Land Use Studies of Central Washington University and the Cumulative Impact Analysis, which is a part of the city's shoreline master program, were used to identify and prioritize suitable restoration projects on Medical Lake. Those restoration opportunities are listed in Section 7.0 of this plan.

With projected budget and staff limitations, the city is limited as to what it can accomplish in implementing restoration projects or programs on its own. However, the city's SMP represents an important vehicle for facilitating and guiding restoration projects and programs that can be partnershiped with private, non-profit and/or educational entities. The restoration projects listed in Section 7.0 will be implemented directly proportionate to funding opportunities. Volunteerism will also play a big part in implementing restoration strategies. The Medical Lake Restoration Plan will adhere to the concept of implementing "doable" projects, large and small, that are meaningful and have the benefit of the community's support. The city can provide direction and leadership to assure that restoration designs meet the identified goals in this plan as well as the city's comprehensive plan. However, funding will remain a problem as no line in the city's annual budget is dedicated to restoration projects. The city should/could seek funding from state, federal, private and other sources to implement restoration, enhancement, and acquisition projects.

2.0 REGULATORY BACKGROUND

The state has directed local governments to develop SMP provisions "…to achieve overall improvements in shoreline ecological functions over time upon adoption of the master program." This overarching goal is accomplished primarily through two distinct objectives:

1. **Protection** of existing shoreline functions through regulations and mitigation requirements to ensure "no net loss" of ecological functions from baseline environmental conditions; and

2. **Restoration** of shoreline ecological functions that have been impaired from past development practices or alterations.

The no net loss concept is also applied to shoreline ecological functions and is embedded in the Act and in the goals, policies and governing principles of shoreline guidelines and other federal and state environmental protections (e.g. the Clean Water Act). Washington's general policies for shorelines of the state include the "protection and restoration of ecological functions of a shoreline's natural resources." This goal comes from the Act which states: "Permitted uses in the shoreline shall be

designed and conducted in a manner which minimizes insofar as practical, any resultant damage to the ecology and environment of the shoreline area."

2.1 Defining Restoration

There are numerous definitions for "restoration" in scientific and regulatory publications. Specific elements of these definitions often differ, but the core element of repairing damage to an existing, degraded ecosystem remains consistent. In the SMP context, the WAC defines "restoration" or "ecological restoration" as:

> *"…the reestablishment or upgrading of impaired ecological shoreline processes or functions. This may be accomplished through measures including, but not limited to, revegetation, removal of intrusive shoreline structures and removal or treatment of toxic materials. Restoration does not imply a requirement for returning the shoreline area to aboriginal or pre-European settlement conditions" (WAC 173-26-020(27)).*

Using the WAC definition of restoration, in regards to state shorelines, it is clear the effort should be focused on specific shoreline areas where natural ecological functions have been impaired or degraded. The emphasis in the WAC is to achieve overall improvement in existing shoreline processes or functions, where functions are impaired. Therefore, as stated previously, the goal is not to restore the shoreline to historically natural conditions, but rather to improve on existing, degraded conditions. In this context, restoration can be broad and implemented through a combination of programmatic measures (such as surface water management; water quality improvement; and public education) and site specific projects (such as removing old abandoned docks or revegetation of a blighted shoreline area). It is important to note that the guidelines do not state that local programs should or could require individual permitees to restore past damages to an ecosystem as a condition of a permit for new development (Washington State Department of Ecology, 2004). The restoration planning element therefore focuses on the City as a whole rather than parcel by parcel or by permit.

3.0 INVENTORY OF SHORELINE CONDITIONS

3.1 Introduction

In 2004, the City of Medical Lake obtained a grant from the Washington State Department of Ecology (D.O.E.) to conduct a characterization of its shoreline jurisdiction as defined by the state's Shoreline Management Act (RCW 90.58). The purpose of the study was to conduct a baseline inventory of abiotic, biological, and cultural conditions in the City's shoreline jurisdiction, which provide the basis for the City's Shoreline Master Program update. This characterization helped the City identify existing conditions, evaluate functions and values of resources in its shoreline jurisdiction, and explore opportunities for conservation and restoration of ecological functions.

The geology of Medical Lake is unique in that the entire western shoreline abuts state land and has a natural shoreline classification assigned to it. These shorelines are relatively free of human influence and the shorelines are relatively intact or minimally degraded.

The north and south shorelines are where several neighborhood and regional parks are located; these shorelines are classified as urban conservancy. These shorelines are suited for water-related or water enjoyment uses. Along the western shoreline there is an abundance of open space along with

scattered patches of wetlands considered as sensitive areas and are regulated by the City's Critical Areas Ordinance. At the north end of the lake is North End Park, a small two-acre passive park consisting primarily of open space with areas for picnicking and viewing of the lake. At the south end is Waterfront Park, a forty-five acre active regional park, with over one mile of shorelines, picnic areas, a swimming beach, two ball fields and an unimproved boat launch.

Residential development consisting of single-family units, open space, and two City parks (Coney Island and Peper Park) make up the eastern shoreline. Restoration projections are more suited for this reach of the lake as ecological functions are moderately impaired by the residential development that has occurred. Riparian vegetation has been removed and replaced with lawns, which can promote increased runoff and nonpoint pollution. Impervious surfaces, such as residential roads and buildings, can also promote runoff and nonpoint source pollution. In some portions of the shoreline extensive shoreline hardening has occurred which increases wave reflectivity, thereby affecting aquatic vegetation and fish habitat. There are nineteen docks found in this reach, three in very bad condition and abandoned along portions of the shoreline which further impairs this habitat.

Also along this eastern reach is Coney Island Park, one acre in size and adjacent to the Central Business District. This small park serves as an important linkage providing access to lake-based recreation and downtown activities and is also linked to the City's trail system.

The Peper Park facilities cover approximately one acre and is located on the northeastern shoreline of Medical Lake and ranked as the main priority restoration project as it is situated along a collector arterial with prominent exposure to the public. Riparian vegetation has been removed and replaced with grass in the park area with the natural vegetation remaining on the perimeter and continuing north. The shoreline has been modified to promote leisure activities and lake viewing. Frequented by the local geese and duck population, the park has become unserviceable due to the aggressive nature of the geese and the large number of droppings which are scattered through out the park and sidewalk. The park is located on Fourth Street which is a major access road to Eastern State Hospital and in the winter is used as a storage point for snow removed from City streets. Stormwater runoff, when the snow melts, transports road pollutants to the lake as well as to the large wetland complex that is associated with the lake to the north.

3.2 Ecological Functions

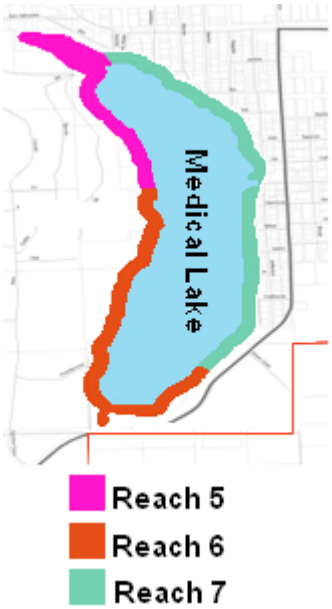
Medical Lake is broken out into three "Reaches" 5, 6 and 7, See Figure 2, Medical Lake Shoreline Reaches.

Reach 5 – The ecological functions of Reach 5 are relatively intact. The shoreline within this reach is primarily natural and undeveloped, providing critical habitat for a wide variety of wildlife and fish species. The riparian vegetation, dominated by a riparian wetland, is diverse and well established, providing much needed bank stability in an area of erodible soils, as well as sources of large and small woody debris. The natural vegetation is largely unmodified with the exception of a small lawn

area associated with North End Park and picnic area. The roadway, which separates the large riparian wetland from the lake, is a potential source of non-point pollution.

Reach 6 – Ecological functions on Reach 6 are also relatively intact. The shoreline within this reach is primarily natural and undeveloped, providing potential habitat for a wide variety of wildlife and fish species. The riparian vegetation is diverse and well established, providing bank stability, as well as sources for large and small woody debris. The natural vegetation is largely unmodified within the jurisdiction of the southeastern side of the lake, with the exception of a walking/biking trail that surrounds the lake. The natural vegetation in the southern end of the lake has been moderately impacted by recreational use, including a lawn area and swimming beach associated with Waterfront Park, and vehicular and pedestrian access to an unimproved boat launch at the south end of the lake. The neighboring roadway is a potential source of non-point pollution.

Figure 2
Medical Lake Shoreline Reaches



Reach 7 – The ecological functions along Reach 7 are moderately impaired by residential development. Riparian vegetation has been removed and replaced with lawns, which can promote increased run-off and non-point pollution. Impervious surfaces, such as residential roads and buildings, can also promote run-off and non-point source pollution. Extensive shoreline hardening has increased wave reflectivity, thereby affecting aquatic vegetation and fish habitat. Several pieces of old broken docks are scattered along the shoreline which could easily be removed. Landscaping of private property, more so unfinished step construction then actual plantings, are a concern for moderate erosion and silt loading.

4.0 RESTORATION OPPORTUNITIES

Based on key ecosystem functions that are currently altered or have the potential to be altered, there appears to be three specific types of restoration actions that will most benefit the shoreline of Medical Lake: Programmatic (regulatory), restoration of impaired ecological functions on public shorelines, and restoration of impaired ecological functions on private property.

4.1 Potential Protection and Restoration Priorities

Reach 5

1. No development and very little shoreline modifications for recreational purposes will be permitted. Wetland and riparian areas south of the picnic area are protected and regulated under the City's Critical Areas Ordinance (programmatic) as this section of the shoreline segment is considered to be priority wildlife habitat. Enhancement and protection measures that will improve the conversion of critical wildlife habitat such as nesting sites and foraging areas will be encouraged.

2. Restore the riparian vegetation buffer along the shoreline picnic area.

3. "Educational Signage" with regards to good stewardship of wetlands and wildlife habitat and "Caution Signage" concerning the need to not feed the geese in the lake should be made part of the strategy to protect the shoreline and improve the lake's water quality

4. Protect the stands of deciduous trees being decimated by a colony of beavers just south of North End Park. After consulting with the professional staff of the Lands Council regarding the problem, two possible mitigating actions immerged; (1) remove the beavers which are bringing down the stands of Aspen trees along the western shoreline just south of the boat launch at North End Park, and also, the newly planted trees along private property with shoreline frontage at the southeastern shoreline, or (2) protect the trees by placing screening around the trunk of the trees at an appropriate height, therefore, not allowing access to the tree. Although the impact at the present time is minimal, over the course of time the potential for wide destruction of the trees is probable where well over one hundred trees are at risk.

<u>Reach 6</u>

1. No development is permitted, as a majority of the land is recreational or open space. Shoreline recreational modifications have seriously degraded a section of the shoreline and the cliff area on the eastern side. Opportunities for restoration and protection in the southern and southeastern sections of the reach are plentiful. The City should/could form a partnership with civic organizations to restore and improve the shoreline's ecological functions in heavily public access areas

2. Civic organizations and the public should/could work with the City to restore the ecology of the shoreline along the eastern cliff area, and the section of the reach between the public boat ramp, Waterfront Park beach and the shoreline picnic area.

3. The City should/could establish a new section of the City's trail system through the degraded area of the shoreline near the public boat launch where numerous spider paths have been formed. This would restore a badly tarnished area and allow for the public, using the trail, a picturesque view of the lake. This would also reduce the trampling of native vegetation by this extensive network of informal trails and provide a deterrent to the increasing amount of trash and litter scattered along the shoreline.

Reach 7

1. Encourage the establishment of "Riparian Management Areas" (RMAs) to act as a buffer from adjacent land disturbances. This could coincide with encouragement of planting native vegetation, except when they are considered noxious weeds, and limiting clearing and disturbance of privately owned residential properties with shoreline frontage.

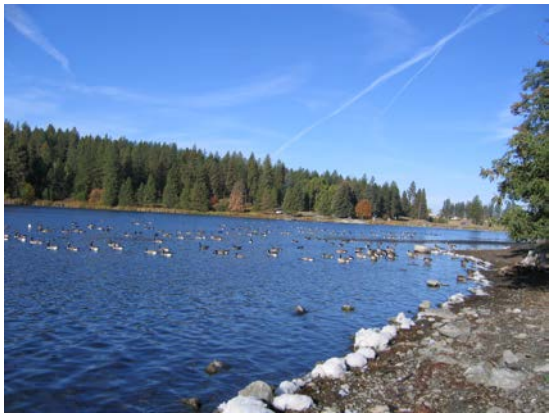
2. Map RMAs on all plans and delineate with silt fencing and a compost berm to protect soils and vegetation from erosion and construction damage.

3. Recognizing that private docks are an acceptable accessory use for shoreline property owners, however, they should be in a state of good repair for both safety and aesthetic purposes. New or replacement docks should be designed and located to minimize their impact on the natural environment and blend into the site as much as possible.

4. Work with the City to restore native riparian vegetation buffers along its two shoreline parks.

5. Prior to issuance of building permits, plats, short plats or other shoreline development approval the developer shall submit adequate plans for the preservation of shoreline vegetation, for control of erosion during and after construction, resulting in permanent shoreline stabilization. Such plans shall be a part of the shoreline permit, if one is required.

6. Reevaluate the size and use of Peper Park as a practical place to locate a public park.



5.0 RESTORATION GOAL AND SUPPORTING POLICIES

The goals and policies listed below are intended to support and complement the Shoreline Restoration and Protection goals and policies set forth in Chapter 3, Goals and Policies for Shoreline Environments of the City's Shoreline Master Program (SMP) and direct the course of the City's shoreline restoration efforts. They are designed to promote the recovery of degraded areas and impaired ecological functions through restoration strategies and policies. The health of the lake itself depends in part on the health of the shoreline.

The shoreline ecological functions that directly affect Medical Lake and which are the focus of the goals and policies of this plan affect water quality, hydrology, lake temperature and fish and wildlife habitat. Each of those things is important to the overall health of the lake, and also affects the community.

- Water quality affects fish and wildlife and their habitat, recreational use of the lake, and human health.
- Hydrology affects the availability of water for irrigation, water dependent vegetation, and recreation.
- Light energy affects water temperature, biological processes and plant photosynthesis and growth. Natural light is changed when vegetation is removed.
- Habitat provides opportunities for recreation, including economic generators like fishing, hunting, and boating.

By promoting and supporting restoration of shoreline areas, the City will be taking steps toward restoring the health of the lake as a whole.

Primary Restoration Goal: Restore or rehabilitate impaired or blighted areas along the shorelines to an ecologically functioning condition with the emphasis on native plant communities appropriate to the environmental designation.

Restoration Plan Policy #1: *Summarize degraded shoreline areas and functions documented by previous assessments (Shoreline Inventory and Characterization Report and Cumulative Impact Analysis).*

Existing assessments, analysis reports, and plans have documented the cause and nature of the impairments to the City's jurisdictional waters and contain recommended improvements to address degraded functions. This plan documents their findings, including identification of target impairments and recommended restoration strategies. These assessments and restoration strategies can be found in Section 4.0 of this plan.

Restoration Plan Policy #2: *Prioritize restoration opportunities to identify projects with greatest benefit to shoreline areas.*

In order to most effectively proceed with restoration efforts, this plan prioritizes restoration opportunities in terms of overall benefit to the lake.

Restoration Plan Policy #3: *Work with the public and private property owners to encourage restoration and enhancement of Medical Lake's shoreline areas.*

A majority of the listed restoration projects identified in this plan are located on publically owned land. However, critical impacts such as erosion and sediment loading, shoreline armoring, and the removal of riparian vegetation can be found on private property where funding opportunities are limited. In these cases public/private partnerships emphasizing volunteerism is vital for success.

Restoration Plan Policy #4: *Establish an implementation strategy.*

As directed by WAC 173-26-201(2)(f)(iii-iv), an adequate restoration plan must identify potential restoration partners, potential funding mechanisms, timelines, and benchmarks. Together, these elements comprise an implementation strategy. This plan includes these elements and organizes them to facilitate a workable implementation strategy.

Restoration Plan Policy #5: *Monitor the success of restoration activities and adapt strategies based on monitoring results.*

Monitoring evaluates the effectiveness of the City's efforts to implement the restoration plan and meet the overall restoration goal. Monitoring data may be used to identify successful project designs that serve as examples for future restoration projects. In addition, where monitoring data identifies and documents failed designs; the data will be used to modify the strategy for subsequent restoration design projects.

6.0 PROGRAMMATIC RESTORATION OPPORTUNITIES

Programmatic restoration opportunities are those that can be incorporated into existing or proposed programs with the goal of restoring ecological functions to the shoreline without focusing on specific sites. Programmatic opportunities include approaches like public education, critical areas protection, and regulatory policy changes. These opportunities can and often do address specific sites that have been identified as areas of concern where enforcement or education can serve to mitigate a situation before site-specific action is necessary. The goal of programmatic mitigation is prevention via regulation and education that focuses on behavior and lake stewardship as a means to modify the way in which the public generally views and uses the shoreline areas in Medical Lake.

OPPORTUNITY	**STRATEGY**
1. Public Education	Examples include incorporation of lake restoration practices such as plantings, litter removal, and specific lake stewardship and career opportunities into the existing environmental education curriculum at Medical Lake Public Schools. Also, schools can be assigned to their respective watersheds to foster a conservation relationship between students and their local environment.
2. Shoreline Regulations and Enforcement	The City manages development by regulating use, setbacks, height, bulk, design, and other standards to reduce impacts to ecological functions and the need for future restoration projects.
3. Shoreline Maintenance	The following are four examples of ways in which the City can restore shoreline areas through the City's or another agency's maintenance programs: a. Identify potential funding sources to support the development and implementation of shoreline maintenance and enhancement strategies and low impact development strategies for City parks located in shoreline areas. b. Develop roadside maintenance and enhancement strategies for road right-of-way (ROW) areas. Maintenance strategies can include slope stabilization (seeding/planting of bare soil areas), noxious weed control, and protection of native vegetation. c. Work with the Washington State Department of Transportation to develop best management practices for ROW maintenance along SR-902 within shoreline

areas. The plan can promote the use of native vegetation, the control of invasive/nonnative species, stormwater management, and slope stabilization.

d. Enforcement of the City's Critical Areas Ordinance with particular emphasis on wetlands and wildlife habitat.

7.0 PROPOSED SITE SPECIFIC RESTORATION PROJECTS

There are numerous ecological processes and functions, large and small, fast and slow, operating in an ecosystem. These processes are influenced by both human activity and natural events. When activities or events occur that are detrimental to any part of a lake's ecosystem(s) the outcome can lead to a steady decline in its wellbeing. The complexity and interactions that occur throughout a lake's ecosystem(s) to keeps a lake pristine is staggering. The listed projects below identify impaired ecological functions or ecological functions that this plan intends to rejuvenate, improve, or prevent.

PROJECT	INPAIRED ECOLOGICAL FUNCTIONS
1. <u>Restoration of Peper Park</u>	- Alterations in Nitrogen Levels - Alterations in Phosphorus Levels - Sediment - Toxins That Weaken or Kill Animal & Plant Life

Peper Park is a one acre passive park located on the northeastern shoreline of Medical Lake. It is accessed off of Fourth Street; the main roadway into the Eastern State Hospital complex and fronts a part of the trail that circles the lake, its location gives it high exposure to the public. Large colonies of Canadian Geese have rendered the park insufficient for public use due to the considerable amount of fecal matter and the aggressive nature of the geese. Studies have found (French and Parkhurst, {2009}) that waterfowl fecal matter contributes inorganic nitrogen and phosphorus into fresh water lakes. Small lakes, where resident goose populations are sizeable (>100 birds) and have restrictive circulation and flow-through, such as Medical Lake, stimulate algae and weed growth causing lake eutrophication. Canada geese feces contain 14 mg of phosphorus and 5.7 mg of nitrogen using dry weight with 80% moisture content (Pettigrew, Hahn et al. 1998) causing the sediment in the lake also to be nutrient and phosphorus rich which adds to the problem when seasonal and human made mixing occurs. Phosphates and nitrates occur in small amounts in all aquatic environments and are required to maintain the growth and metabolism of plants and animals. However, in excess amounts, these minerals can prove to be quite harmful. Levels of phosphates and nitrates that are intolerable to local organisms have been known to deplete dissolved oxygen levels by causing algae blooms. Lake eutrophication results in high amounts of phosphates and nitrates levels and is a main cause in the destruction of lake ecosystems. (Ansar & Khad, 2005).

<u>Restoration Strategies</u>

1. Construction of a large engineered rock wall with fencing along the shoreline to serve as an impediment to the geese from reaching the park area and a deterrent for congregating and impacting the shoreline. Natural/native vegetation to be planted up to the rocks at the southern and northern end of the wall

2. Construction of a drainage swale in front of the rock wall to catch and filter petroleum pollutants from Fourth Street's stormwater run-off. The park is also used as a storage area for snow plowed from city streets in the winter. The swale will also serve to catch petroleum pollutants from the snowpack when melting occurs.

3. Large signage to replace the signage currently in the park stating in large letters to please not feed the wildlife (geese). Along with the removal of the barbeque grill in the park area where food scraps have the potential to fall to the ground and are overlooked when cleaning up.

4. Large scraped culvert to be removed, approximately twenty feet off the shoreline. (Aesthetics)

5. Dead tree limbs removed from several trees in the park. (Safety & Aesthetics)

6. Restore native riparian plant vegetation to help stabilize the shoreline bank as erosion is beginning to undermine the sidewalk just north of the park.

PROJECT	IMPAIRED ECOLOGICAL FUNCTIONS
2. Protection of Approximately One Hundred Deciduous Trees Along the Northeastern Shoreline	- Large Woody Debris - Light Energy - Native Vegetation

A colony of beavers, (number unknown), have taken up residence on the northwestern shoreline of Medical Lake. During a survey of the lake in late July, 2011, it was observed that a stand of Aspen trees on the northwestern shoreline were being taken down by beavers. In addition newly planted trees on the southeastern shoreline were also taken down by beavers. Approximately six trees are currently down and two in the process with an additional one hundred trees identified as being at risk. Although the impact at the present time is minimal, over the course of time the potential for wide destruction of trees along this segment of the shoreline is probable. Having a natural environmental designation the eastern shoreline is mostly undisturbed and trees are prevalent along the entire shoreline. The felling of trees for forage and construction can create large openings in the woody canopy along the shoreline resulting in increased sunlight, and corresponding changes in temperature. Beavers are strict herbivores and eat a variety of woody and herbaceous species. Willows, mountain alder, and aspen are important foods. Ideal beaver living sites include ponds, lakes, streams, and rivers.

Restoration Strategies

1. Contact the Lands Council (Beaver Division) for advice and expertise regarding beaver management and management techniques that can be implemented.

2. Inventory the number of trees considered to be at "High Risk" from beaver destruction.

3. Acquire authorization, approval, and funding for beaver management strategies before implementation

4. Assemble a volunteer work force to assist Land Council personnel in placing screening around the trunks of specific trees which will keep the beavers from gnawing them down.

PROJECT	IMPAIRED ECOLOGICAL FUNCTION
3. Renovate/rehabilitate the cliff area directly north of the public boat launch by establishing a view shed area over looking the lake with a picturesque view.	- Sediment - Toxins - Native Vegetation

A unique portion of the Medical Lake shoreline is located in the southeastern segment of the lake in Reach 6 just north of the public boat launch and better known as "the cliffs." Although unique it is also a badly degraded area where an extensive network of informal trails and numerous "spider paths" have been established over time laying the area bare of vegetation in areas and susceptible to extensive erosion. Situated between the lake to the west and the Medical Lake trail and SR-902 to the east the area is highly exposed and highly visited by the public. The cliffs, in this segment of the lake, are technically the shoreline and experience extensive use in the summer months during the hot dog days by the public. Serving as a meeting place for recreational use, the elevation change make the cliffs an ideal spot for jumping into the lake. The natural vegetation has been severely impacted and at points where ground traffic is the most prevalent the natural vegetation is completely gone laying the ground bare and subject to serious erosion and sediment runoff. Without vegetation to slow down and trap stormwater runoff from SR-902 to the lake, the area serves as an excellent means to transport inorganic pollutants from the highway to the lake.

Restoration Strategies

1. Schedule and advertise a community work day with a major focus on cleaning the cliff area of trash, litter, and debris in preparation for restoration activities.

2. Establish a new segment of the trail to serve as a rest area with a picturesque view of the lake taking into consideration the fragile nature of the natural resources.

3. Eliminate the network of informal trails and paths by planting native vegetation and native grasses in badly tarnished areas along with signage asking the public for cooperation in safeguarding restoration projects.

4. Construct steps from a trail access point down to the area used for gathering in the summer months to eliminate the need to access the area from multiple directions.

5. Establish storm water diversions or contaminate ponds to protect the near shore habitat from non-point pollution run-off from the neighboring highway.

PROJECT	IMPAIRED ECOLOGICAL FUNCTION
4. **Develop and implement a community educational component that advocates lake restoration practices such as plantings and stewardship opportunities, litter removal, and lake Limnology or fresh water science.**	- All Ecological Functions (Educational Component)

Often regarded as a division of ecology or environmental science, Limnology aka fresh water science covers the biological, chemical, physical, geological, and other attributes of all inland waters (running and standing waters, fresh and saline, natural or man-made). This includes the study of lakes and ponds, rivers, springs, streams and wetlands. Today, limnology plays a major role in water use and distribution as well as in wildlife habitat protection. Limnologists work on lake and reservoir management, water pollution control, and stream and river protection, artificial wetland construction, and fish and wildlife enhancement.

Restoration Strategies

1. Educate and inform the public, through a series of newspaper articles, on the benefits of having a number of lakes and wetlands as part of the region they live in.

2. Promote Limnology or fresh water science within the community with the intent of generating the interest of the residents about good stewardship practices when it comes to lakes.

PROJECT	IMPAIRED ECOLOGICAL FUNCTION
5. Restoration of impacted ecological functions of the residential shoreline on private property.	- Sediment - Wave Energy - Toxins - Native Vegetation

As previously stated the shoreline designations assigned to Medical Lake are Natural, Urban Conservancy, and Shoreline Residential. A survey of the lake in July of 2011, the Shoreline Inventory and Characterization study of June 2005, and the Cumulative Impact Analysis found the ecological functions in the natural and urban conservancy shorelines are relatively intact with some small exceptions for the recreational uses in the urban conservancy shoreline at the north and south locations of the lake. As can be expected the ecological functions of the shoreline are mostly impacted in the shoreline residential reaches, some on public shorelines but a majority on private property with shoreline frontage. Erosion and sediment issues were found occurring due to abandoned or unfinished step projects, steep banks with no ground cover, and wave reflectivity from unsightly and abandoned bulkheads. Abandoned segments of docks were also found left along the shoreline and sources for non-point pollution of the lake from inorganic petroleum products were identified as coming from access roads and private driveways due to stormwater runoff. Without awareness education that fosters good stewardship the reaches designated shoreline residential will continue to be a problem.

Restoration Strategies

1. Notification of pending public meetings for private property owners with shoreline frontage by postings, mail outs, and publishing, to discuss and view deteriorated shoreline ecological functions.

2. Explain the consequences of unattended, impaired ecological functions on private property with shoreline frontages.

3. Provide education materials and solicit a commitment from private property owners to be aware of and practice good stewardship of their shoreline frontage.

4. Revegetate tarnished areas of the shoreline on private property with native vegetation.

PROJECT	IMPAIRED ECOLOGICAL FUNCTION
6. SECOND TIER PROJECTS	
A. North End Park Wetland Protection	- Toxins from stormwater runoff of Fourth St.
B. North End Park Bank Stabilization	- Sediment erosion of shoreline bank under the sidewalk that is part of the trail system.
C. Revegation of West Bank Picnic Area.	- Vegetation impacted on walking paths at lake edge and area around picnic area.
D. Removal & Control of Invasive Toxic Plants.	- Toxins and native vegetation.

8.0 TIMELINE AND BENCHMARKS FOR IMPLEMENTING RESTORATION

Restoration planning is a new element of the SMP. Restoration goals are long-term efforts and generally occur as funding becomes available. As per WAC 173-26-201(c), master programs must "include planning elements that, when implemented, serve to improve the overall condition of habitat and resources within the shoreline area." To facilitate this policy, this plan outlines five steps that the city may pursue to implement the restoration element of the updated SMP and the policies in this plan. The **first step** will be to establish a restoration oversight program within a department of city government (Planning). Within one year of the SMP's formal adoption by the city and the state of Washington, the city plans to begin implementing this plan. Once familiar with the goals, policies, and opportunities contained in this plan, the city staff proposes to begin **step 2**, outreach activities. Outreach may include any of the following examples:

1. Efforts to form partnerships on site-specific restoration opportunities.
2. Meet with potential restoration partners to develop inter-agency plans for shoreline restoration.
3. Efforts to meet with public and private schools to foster shoreline education and volunteer opportunities.

Once the city has identified potential restoration partners and specific programmatic or site specific projects, the **third step** would involve making requests for funding. Applications for funding will

target one or more of the proposed restoration projects. The **fourth step** involves support throughout the construction phase of a restoration activity. Examples of City support may include, but are not limited to, coordination of city resources such as material transport, site preparation, signage, public outreach, etc. The fourth step would occur later in the timeline after the city has had the opportunity to meet with restoration partners, discuss potential projects and funding sources, and apply for funding. The **fifth and final step** would monitor the success of the restoration program, as measured by meeting the benchmarks of this plan, and assess the existing program based on monitoring results. The results of this assessment will document progress in implementing the restoration element of the SMP and aid in determining whether a subsequent update is necessary to the SMP, as required under RCW 90.58.080(4). Exact dates cannot be specified for these five steps due to uncertainties in the SMP update, adoption schedule, staffing and funding availability.

Table 1 provides a target timeline for aiding in conceptualizing the process. Benchmarks associated with each implementation step were developed to provide a means of demonstrating progress and compliance with SMP restoration goals. Because of uncertain external funding sources and partnership opportunities, benchmarks for site-specific restoration projects are not the focus of this plan. Dates associated with each benchmark are based on an estimated formal Shoreline Restoration Plan.

Table 1: Timeline and Benchmarks

Step	Year Ending	Project Description	Benchmark
1	2012	City allocates staff resources for restoration program	City verifies that sufficient resources have been allocated by 12/31/2011.
2	2012	Meet with potential restoration partners by end of the second quarter in 2012	City will have met with potential restoration partners. Meetings may be with one or more restoration partners.
3	2012	City, in partnership with others will apply for restoration funding	City will participate in one or more applications for restoration funding in partnership with organizations identified through outreach activities by 12/31/2012.
4	2013	City will provide support for listed restoration projects	City will provide support for at least one restoration project by 12/31/13.
5	2014 - 2015	City will monitor the progress of the program, and assess and adjust as necessary	City will monitor the progress and success of the city's restoration program by 12/31/2015.

9.0 MONITORING OF PLAN BENCHMARKS

The following monitoring methods are designed to document progress with the implementation of this restoration plan. Proposed monitoring activities are tied to the benchmarks established in Table 1, above.

***Benchmark 1*:** Allocate staff resources by 2012 to oversee restoration projects, identify granting entities, and establish timelines and adjust if necessary.
Monitoring Method: Research and evaluate annual restoration funding sources to determine if the proposed projects sufficiently meet the funding source's criteria.
Contingency: Submit funding applications to more than one agency
Adaptive Management: If the city cannot commit to in-kind support for staff to implement a restoration program, the responsibility may need to be parceled out and delegated to volunteerism.

***Benchmark 2*:** Identify and meet with potential restoration partners by the end of the first quarter in 2012.
Monitoring Method: Document that meetings have occurred or that an attempt was made to schedule meetings.
Contingency: Look to expand search area outside of the local area to recruit restoration partners.
Adaptive Management: If the city is unsuccessful at organizing a meeting, at the local level, with potential restoration partners, a broader search will be carried out to include professional and non-profit agencies with demonstrated restoration skills based on available grant funding.

***Benchmark 3*:** Apply for funding by 2012 (with partners)
Monitoring Method: Document application for restoration funding.
Contingency: Document why no action was made and how to ensure future action (e.g. lack of partners, staff unavailable, etc.).
Adaptive Management: If the city is unable to partner on restoration funding applications for any reason, project timelines will have to be revised or smaller projects planned for.

***Benchmark 4*:** City will participate in and provide support for a restoration project by the end of 2014
Monitoring Method: Document participation in a restoration project.
Contingency: Summarize attempts made to assist restoration projects and revise strategy to a method more capable of yielding results.
Adaptive Management: If the city is unable for any reason to support a restoration project, the city may revise its strategy for obtaining restoration partners and instead implementing programmatic restoration strategies.

***Benchmark 5*:** City will monitor the progress and success of the city's restoration program and summarize success of implementing restoration plan by 2015.
Monitoring Method: Documentation of compliance with project timelines
Contingency: Identify and correct, as best possible, reasons for delays in implementation strategies.
Adaptive Management: Restructure project management techniques to identify causes for delays in meeting specific timelines that if not met would impact the completion of restoration projects.

10.0 CONCLUSIONS

This plan provides several programmatic and site-specific opportunities for restoring the City's shoreline areas. These opportunities, when implemented, are designed to achieve a net benefit in shoreline ecological conditions by documenting the following as key ecological impairments within Medical Lake's shoreline areas: Lack of riparian vegetation and large woody debris, extensive shoreline armoring, nutrient and toxic loading from an over populated geese residency and stormwater runoff. The ecological benefits that would be realized by implementing this plan include: increased use of soft approaches (programmatic opportunities) for shoreline stability; Rainbow Trout habitat improvement; reduced silt and erosion filtration from shoreline riparian vegetation; improved

wildlife corridor connectivity; removal of noxious vegetation; bank stabilization and eventual introduction of large and small woody debris.

11.0 FUNDING AND PARTNERSHIP OPPORTUNITIES

With restoration planning being a new element of the SMP, implementing the proposed restoration activities identified in this plan will be a challenge given the economic situation of the city and the Spokane area and the lack of a dedicated funding source. At present, shoreline restoration is almost entirely dependent on grant funding, which depends upon state and federal monies and volunteerism. The city's ability to devote any general funds to the implementation of this plan is not an option at this time, but potential external funding sources do exist, though the process by which organizations are able to obtain funds is typically quite competitive. The sources listed here do not represent an exhaustive list of potential funding opportunities, but are meant to provide an overview of the types of opportunities available

The Washington Wildlife Recreation Program (WWRP) provides funds for the acquisition and development of recreation and conservation lands. WWRP funds are administered by account and category. The Habitat Conservation Account includes critical habitat, natural areas, and urban wildlife categories. The Outdoor Recreation Account includes local parks, state parks, trails, and water access categories. Letters of intent are usually due March 1 applications are usually due May 1.

Washington Department of Fish & Wildlife (WDFW)
600 Capitol Way North
Olympia, WA 98501-1091
360-902-2806.
http://wdfw.wa.gov/volunter/vol-7.htm
Grant programs administered by WDFW are described below.

☐ Aquatic Lands Enhancement Account (ALEA) Volunteer Cooperative Projects Program: The WDFW accepts grant applications from individuals and volunteer groups conducting local projects to benefit fish and wildlife. Grants have ranged from $300 to $75,000 in past years to help volunteers pay for materials necessary for projects approved by the agency. Funding cannot be used for wages or benefits. Examples of past projects include habitat restoration, improving access to fish and wildlife areas for disabled people, fish and wildlife research, public education and fish-rearing projects that can benefit the public.

☐ Landowner Incentive Program: The Landowner Incentive Program (LIP) is a competitive grant program designed to provide financial assistance to private landowners for the protection, enhancement or restoration of habitat to benefit species at risk on privately owned lands. At risk species depend on specific ecosystems for survival. These ecosystems include riparian areas, wetlands, oak woodlands, prairies and grasslands, shrub steppe and near shore environments. Through Washington's LIP, individual landowners are eligible to apply for up to $50,000 in assistance. In addition, $50,000 is typically set aside for small grants. Any individual applying for these small grant funds may apply for up to $5,000. A 25% non-federal contribution is required, which may include cash and/or in-kind (labor, machinery, materials) contribution.

Interagency Committee for Outdoor Recreation
Washington Wildlife Recreation Program (WWRP)
PO Box 40917
Olympia, WA 98504
360-902-3000

National Fish and Wildlife Foundation
1120 Connecticut Avenue, NW, #900
Washington, DC 20036
Kathleen Pickering 202-857-0166

Non-profit organizations, local, state or federal government agencies are eligible to apply for funds for community-based projects that improve and restore native salmon habitat, remove barriers to fish passage, or for the acquisition of land/conservation easements on private lands where the habitat is critical to salmon species. Specific grant programs are listed below.

☐ Five-Star Restoration Matching Grants Program: The Five-Star Restoration Program provides modest financial assistance on a competitive basis to support community-based wetland, riparian and coastal habitat restoration projects that build diverse partnerships and foster local natural resource stewardship through education, outreach and training activities.

☐ The Migratory Bird Conservancy: The MBC will fund projects that directly address conservation of priority bird habitats in the Western Hemisphere. Acquisition, restoration, and improved management of habitats are program priorities. Education, research, and monitoring will be considered only as components of actual habitat conservation projects.
Salmon Recovery Funding Board (SRFB)
Lead Entity Coordinator: Mary Jorgensen
(206) 296-8067
mary.jorgensen@metrokc.gov

Environmental Protection Agency (EPA)
Region 10: Pacific Northwest
Grants Administration Unit
Bob Phillips
phillips.bob@epa.gov
(206) 553-6367

The Environmental Protection Agency funds a variety of projects that aim to safeguard the natural environment and protect human health. Potential opportunities specific to watershed protection and restoration are listed below.

☐ The Clean Water State Revolving Fund Program: Under this program, EPA provides grants or "seed money" to all 50 states plus Puerto Rico to capitalize state loan funds. The states, in turn, make loans to communities, individuals, and others for high-priority water-quality activities. Projects funded by the low-interest loans may include wetlands protection and restoration, estuary management efforts – including wildlife habitat restoration – and development of stream bank buffer zones.

☐ Wetland Protection, Restoration, and Stewardship Discretionary Funding: This program provides support for studies and activities related to implementation of Section 404 of the Clean Water Act for

both wetlands and sediment management. Projects can support regulatory planning, restoration or outreach issues. Typical grant awards range from $5,000 to $20,000.
U.S. Fish & Wildlife Service (USFWS)

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