

CHAPTER 7

NATURAL RESOURCES AND HAZARDS

Juneau is situated in a spectacular and varied natural setting. Its aquatic and terrestrial resources not only are of exceptional economic, aesthetic, and recreational value, but also have numerous implications for land use planning and management. In addition to their distinctive characteristics, each resource is interdependent in a complex and often highly sensitive environment.

The CBJ government does not engage in areas of natural resource management that are usually reserved to the state or federal governments, including timber, fish, or game allocation. However, conservation or development of some local natural resources that are now controlled by federal and state agencies, such as fish and wildlife habitat and shorelines, are best managed by local entities. This is true in terms of trying to achieve habitat protection in a way that is sensitive to the rights of landowners as well as to the resource. It is also true because cities have a much broader grant of authority from the state, that of land use control, than do state agencies.

The policies, SOPs, development guidelines and implementing actions that follow are those called for by the citizenry and appropriate to the management of natural resources at the local level through the use of local authority. In some cases, notably wetlands, the CBJ government has taken a highly protective stance and proposed a prominent management role for itself, in part to manage the values these resources represent, but also to conduct wetlands management and regulatory affairs in a manner more sensitive to the needs of land owners and developers than might be the case if wetlands management was left entirely in the hands of state and federal agencies.

NATURAL RESOURCES

Environmental Protection

Juneau is located in a temperate rainforest that has been characterized as one of the world's most beautiful natural settings. Throughout this comprehensive planning process, residents have indicated repeatedly their desire to protect the region's scenic beauty, fish and wildlife habitat and public access to water and forested areas. They also seek to promote the careful management of natural resources while supporting the local fishing, tourism, and recreational activities that depend on the health and vitality of these resources. Through a plan that emphasizes compact development, the CBJ government can mitigate adverse impacts of urban life and provide community sewer and water systems sufficient to protect public health, while avoiding or minimizing harm to the region's surface, groundwater and fish and wildlife resources.

Other sections of the Comprehensive Plan address natural resource issues; these are found in Chapters 9 (Parks, Recreation, Trails and Natural Areas), 11 (Land Use Maps and Subarea Guidelines), and 12 (Public and Private Utilities and Facilities).

POLICY 7.1. TO PROTECT THE REGION'S SCENIC, ENVIRONMENTAL, AND ECONOMICALLY-VALUABLE NATURAL RESOURCES FROM THE ADVERSE IMPACTS OF URBAN DEVELOPMENT. DEVELOPMENT SHALL BE CONTROLLED CAREFULLY AND, IF NECESSARY, PROHIBITED IN NATURALLY HAZARDOUS AND ECOLOGICALLY-PRODUCTIVE OR SENSITIVE AREAS.

Standard Operating Procedure

- 7.1 - SOP1 Designate on the Comprehensive Plan Land Use Maps areas containing valuable natural resources and/or natural hazards. Provide development standards and controls for those lands to minimize the adverse impacts of urban development and use.

Development Guideline

- 7.1 - DG1 Care should be taken when clearing land for development to maintain healthy trees and, when selecting which trees to remove, to avoid and mitigate against the effects of “blow down” when trees are removed on one property, creating new wind patterns for adjacent properties, such that mature trees on those lands are blown down by winds.

Implementing Actions

- 7.1 - IA1 Fund a work program to include adequate staff, equipment, and software to establish and maintain an inventory and electronic map on the CBJ's Geographic Information System (GIS) of high-value delineated wetlands and anadromous fish watercourses within the roaded area.
- 7.1 - IA2 On the CBJ GIS maps, staff should map the anadromous fish watercourses and high-value wetlands to determine whether lands need to be purchased to create continuous, unfragmented fish and wildlife corridors from the upland forested areas and icefield to the sea. These unfragmented corridors may also be suitable as non-motorized hiking trails.
- 7.1 - IA3 Collaborate with state and federal agencies to compile and maintain an inventory, a GIS database map of locations, and should develop management plans for all categories of CBJ-owned natural resources such as firewood, sand, and gravel.
- 7.1 - IA4 Adopt a “dark sky” outdoor lighting code and require adherence to this code in rural areas of the borough, on the road system, from which stars and the aurora borealis can be viewed. Those areas should be protected from glare from outdoor lighting that obscures those sightings.

Coastal Resources Planning

Coastal resources are clearly important to the environmental quality and economic vitality of the community. They provide natural habitat for valued species, recreation, view corridors, food sources, and a sense of well-being for residents and visitors. Environmentally-sensitive habitats and waterfront areas that are particularly subject to intense development pressures, such as downtown Juneau, Auke Bay, North Douglas Island, and Echo Cove, merit special attention.

POLICY 7.2. TO PRESERVE AND PROTECT FISH AND WILDLIFE HABITAT, SCENIC CORRIDORS AND PUBLIC ACCESS TO THE WATER, AS WELL AS WATER-DEPENDENT USES IN PLANNING FOR USE OF COASTAL AREAS.

Implementing Actions

- 7.2 - IA1 Designate areas for water-dependent uses on the Comprehensive Plan Land Use Maps, the CBJ GIS maps, and the Land Use Code Maps. Identify and designate on these maps publicly-owned shoreline areas that are appropriate for publicly-accessible open space/natural areas or recreational use, for fish and wildlife corridors for fishing and hunting, and/or for view corridors.
- 7.2 - IA2 Seek expanded authority for the granting of U.S. Army Corps of Engineers Section 404 permits by the CBJ government for wetland areas specified in the Juneau Wetlands Management Plan (JWMP).

Stream Corridors and Lake Shorelines

Stream courses and lakes possess unique ecological, recreational, and scenic values. Portions of the stream corridors also function as floodways and floodplains and protect against erosion of adjacent properties. Development along stream corridors and lake shorelines can destroy their ecological, scenic and recreational values. It also can cause destruction of stream banks, increased runoff, sedimentation and pollution, and increase the danger of flooding to people and property. Carefully designed and sited development that is responsive to the conditions of the site can diminish the potential negative impacts on these ecosystems as well as surrounding land uses, and may be able to actually enhance degraded stream and lake habitat and water quality.

Shoreline values can be maintained and destruction of property from flooding and stream bank erosion minimized by careful management of shoreline development, which primarily takes the form of requiring development to be set back from shorelines of creeks, streams and lakes and to retain or restore natural vegetation. The Land Use Code provides for some basic, or minimum, streamside protection. Additionally, many parcels along the Mendenhall River have been purchased by the CBJ government as greenbelt areas, providing greater protection for these water bodies and habitats. Further efforts are required to protect those and other stream corridors and to coordinate the various management and enhancement activities.

POLICY 7.3. TO PROTECT RIPARIAN HABITAT, INCLUDING STREAM CORRIDORS AND LAKE SHORELINES, FROM ADVERSE EFFECTS OF DEVELOPMENT AND TO PROVIDE A HIGHER LEVEL OF PROTECTION FOR NON-URBAN SHORELINES IN PUBLIC OWNERSHIP.

Development Guidelines

- 7.3 - DG1 Rivers, streams, and lakes should be managed so as to protect natural vegetation, water quality, fish or wildlife habitat, and natural water flow.
- 7.3 - DG2 On publicly-owned lands, designated on the Land Use Code Maps as not appropriate for development an area extending 200 feet from the Ordinary High Water Mark (OHWM) of the shorelines or stream corridors of the anadromous fish creeks, streams, and lakes listed in the most recently CBJ-adopted Alaska Department of Fish and Game (ADF&G) inventory of anadromous fish streams.

On CBJ-owned lands that are not designated for disposal in the 1999 CBJ *Land Management Plan*, maintain 200 foot stream buffers from the OHWM of the shorelines of the following anadromous fish streams: Peterson Creek (out-the-road), Shrine Creek, Bridget Creek, Cowee Creek, Davies Creek, Peterson Creek (northwest Douglas Island), Eleven Mile Creek, Middle Creek, and Hilda Creek. This buffer zone or setback may be adjusted or altered, on a case-by-case basis, when a scientific analysis of the specific function(s) of the particular creek's value(s) finds that the setback should be more based on its functional value(s).

- 7.3 - DG3 On privately-owned lands, require a minimum setback of 50 feet from the OHWM of all creeks, stream corridors and lake shorelines listed in the most recently CBJ-adopted ADF&G inventory of anadromous fish streams. This 50-foot setback is to be considered a basic or minimum setback from the water body and its riparian habitat until a biological functional analysis of the water body and adjacent habitat is conducted that identifies a specific greater or lesser setback distance appropriate to the development and functional value of the particular water body and associated riparian habitat, and an ordinance amending that setback is adopted.
- 7.3 - DG4 CBJ Community Development Department staff will determine the OHWM on properties subject to development permits. OHWM determinations will be based on habitat and biological considerations according to the adopted OHWM definition in Title 49, the Land Use Code.

Implementing Actions

- 7.3 - IA1 Fund an effort to develop for adoption into the Land Use Code a riparian habitat protection ordinance that tailors riparian standards to the particular stream-type, functional value and location and which would be consistent with, and complementary to, related Title 49 regulations protecting wetlands, flood zones and coastal areas.
- 7.3 - IA2 Amend the Land Use Code to update the definition of OHWM as soon as possible.

- 7.3 – IA3 Investigate the feasibility of providing tax incentives and tax relief for property owners who implement riparian or wetland habitat protection and conservation measures and improvements to their land, such as easements, restoration and assured Best Management Practices (BMPs) maintenance activities.
- 7.3 – IA4 Require recorded easements on plats and on property records for major developments to provide public access to shorelines and stream corridors, consistent with appropriate statutory and case law.
- 7.3 – IA5 Give high priority to public acquisition of open space/natural areas and/or public recreation easements to the stream corridor of Pederson Hill Creek (aka “Casa Del Sol Creek”) to add to the recent public acquisition of stream corridors of Montana Creek and the west side of the Mendenhall River.
- 7.3 – IA6 Where development or other causes have led to serious stream bank erosion, undertake programs, in cooperation with other appropriate agencies and private owners, to restore degraded stream banks and prevent further erosion in a manner that provides erosion protection and safe fish habitat.
- 7.3 – IA7 The Wetlands Review Board (WRB) should advise the Planning Commission regarding direct and cumulative impacts to riparian functions when variances to stream and lakeshore setbacks are requested by Applicants. The WRB should also make recommendations regarding appropriate mitigation measures when such variances are deemed warranted by the WRB and Planning Commission.
- 7.3 - IA8 Amend the Land Use Code to include additional criteria in the grounds for variance standards that require an evaluation of impacts to habitat and water quality for variance requests from streamside and lakeshore setbacks, and to provide for mitigation when variances to stream or lakeshore setbacks are granted.
- 7.3 - IA9 The CBJ government should designate publicly-owned shoreline areas along the roaded areas of the borough for public access recreation, stream corridor protection and/or wildlife access protection areas.
- 7.3 - IA10 Conduct biological functional analyses on streams and adjacent habitat to determine the appropriate setback from each of the following streams for new development on CBJ—owned land: Peterson Creek (out-the-road), Shrine Creek, Bridget Creek, Cowee Creek, Davies Creek, Peterson Creek (northwest Douglas Island), Eleven Mile Creek, Middle Creek, and Hilda Creek. Once the appropriate stream corridor width has been determined for a stream, adopt that stream corridor as a required protection area in the Comprehensive Plan and/or Land Use Code.

POLICY 7.4. TO ADOPT THE MOST RECENT ALASKA DEPARTMENT OF FISH AND GAME (ADF&G) INVENTORY OF ANADROMOUS FISH STREAMS FOR USE IN REVIEWING DEVELOPMENT PROPOSALS ON LAND CONTAINING WATERBODIES.

Implementing Actions

- 7.4 - IA1 Annually adopt by ordinance or resolution the most recent list of anadromous fish streams pursuant to the ADF&G annual or biannual inventory entitled Waters Important to Spawning, Rearing, or Migration of Anadromous Fishes—Southeastern Region. Update the CBJ’s GIS database and mapping layers and the CBJ Open Space Resolution as additions or corrections are made to the list. The CBJ should make the adopted updated list on the city’s website.
- 7.4 - IA2 Concurrently with adoption of the ADF&G annual or biannual inventory of anadromous fish streams in the borough, revise the Land Use Code §49.70.310(a)(4) to state “Within 50 feet of the banks of streams designated as anadromous fish habitat by the most recently CBJ adopted inventory of anadromous fish streams listed by the Alaska Department of Fish and Game.”
- 7.4 - IA3 Revise the CBJ 49, the Land Use Code, to compile all of the requirements for stream and lake shoreline management that are now under Habitat and Wetlands Management and map water bodies and riparian habitat subject to those regulations and guidelines on the CBJ GIS system.

Wetlands

The extensive wetlands in the borough include estuarine areas, freshwater wetlands that may or may not be directly adjacent to a water body, and forested wetlands. Wetlands are defined by the U.S. Army Corps of Engineers (Corps) as areas where the prevalent vegetation is typically adapted for life in saturated soils, where there is water sufficient to saturate the soil during part of the growing season, and where soil conditions indicate that the soil is saturated. Approximately 54 percent of the areas addressed in the *Juneau Wetlands Management Plan* (Mendenhall Valley, Lemon Creek, Auke Bay and North Douglas) were defined as wetlands by the Corps in 1986. Additional wetland areas have been, and continue to be, identified by the Corps and added to the documented inventory of wetlands in the borough.

Wetlands serve important natural and human functions. These include providing fish and wildlife habitat and food sources, storm-water retention, recharge of groundwater, cleaning surface waters by retaining sediment and toxins, flood protection and erosion control, and providing recreational and scenic values to the borough's population.

Prior to 1993, regulation of wetlands management in the borough was primarily the purview of the Corps. To establish a stronger local role in wetlands management, in 1992 the CBJ government adopted the *Juneau Wetlands Management Plan* (JWMP), which:

1. Classifies wetlands based on their environmental functions and community needs (from the higher value Category A and B wetlands, to the lower value Category C and D wetlands);
2. Requires mitigation for development impacts that is appropriate to the environmental value of the wetland;
3. Provides for establishment of a CBJ-administered Wetlands Mitigation Bank; and
4. Provides for local wetlands permitting for lower value wetlands through decisions of the CBJ Wetlands Review Board.

The regulatory provisions of the JWMP and the maps of the wetlands covered under that Plan have been adopted into the CBJ Land Use Code. The Code also established a nine-member CBJ Wetlands Review Board. The Board has also adopted a general wetlands mitigation strategy that recommends that, to mitigate for historic and future impacts to the wetlands inventory in the borough, the CBJ government pursue (1) wetlands protection, (2) public education, and (3) wetlands restoration and creation projects.

The CBJ government worked for many years to obtain a General Permit from the Corps to allow the Wetlands Review Board to assume all responsibility for wetlands permitting on the Category C and D wetlands. In March 1994, the CBJ and Corp signed a cooperative permitting agreement that allowed the CBJ government to conduct its local wetlands permit process for projects in lower value wetlands and in July 1995, the Corps issued the General Permit. In 2011, the General Permit agreement with the Corps of Engineers was not renewed, because the vast majority of C and D wetlands have been filled and the permit authority has not been used. The CBJ government will seek to renew this permit authority with the Corps of Engineers when new Category C and D wetlands are identified in the JWMP update scheduled to begin in 2013.

The Juneau wetlands management program guides the use and protection of our wetland resources. The Land Use Code codifies key portions of the *Juneau Wetlands Management Plan*. The *Comprehensive Plan* serves as the policy backbone for the wetlands regulatory program and addresses issues that can't be addressed solely through regulation of private development.

The 2008 Federal Compensatory Mitigation Rule substantially changed the U.S. Army Corps of Engineers mitigation requirements. In 2009, CBJ re-evaluated its mitigation strategy and the previous goal of creating a wetland mitigation bank. The Assembly and Planning Commission concluded that a mitigation bank was no longer an economical nor practical option for Juneau. Instead, the wetland management and wetland mitigation focus should be re-directed toward an update of the JWMP to identify more low-value Category C and D wetlands. The CBJ government has since received a grant award for a major update of the JWMP. This four-year project will begin in 2013.

POLICY 7.5. TO PROTECT HIGH-VALUE WETLANDS FROM ADVERSE EFFECTS OF DEVELOPMENT THROUGH LAND USE MANAGEMENT AND TO SPONSOR OR PARTICIPATE IN EFFORTS TO ENHANCE OR RESTORE THE ENVIRONMENTAL VALUES OF WETLANDS IN THE BOROUGH.

Standard Operating Procedures

- 7.5 - SOP1 Seek acquisition of Category A and EP (enhancement potential) wetlands to CBJ ownership for protection, and for use as wetland mitigation projects, respectively.
- 7.5 – SOP2 Protect the values of wetlands that have been developed as, or identified as prospective education sites, from impacts caused by adjacent development. Cooperate with public agencies and interest groups in the identification and development of appropriate wetlands interpretive and education sites and facilities.
- 7.5 – SOP3 Incorporate wetland and stream habitat considerations into the planning, site selection, budgeting, design, construction and operation of CBJ agency projects affecting wetlands and anadromous fish stream corridors.

Development Guidelines

- 7.5 - DG1 Identify, assess, and consider the cumulative impacts associated with wetland fills while making local wetland management decisions. The JWMP requires that cumulative changes in the wetlands base be considered by the Wetlands Review Board for each local wetland permit issued, as well as during preparation of an annual report on local wetlands management.
- 7.5 - DG2 Require long-term monitoring of mitigation projects undertaken by CBJ agencies or private parties to ensure that the mitigation measures were undertaken as required by the permit and to ascertain their success.

Implementing Actions

- 7.5 – IA1 Update existing maps and expand the coverage of the JWMP to include wetlands identified by the Corps since 1986 (the date of the Corps’ maps used as the basis for the JWMP), particularly forested wetlands. Extend the wetland classification system to these wetlands and include lower value wetlands under a General Permit, as appropriate under the Corps’ requirements for General Permits.
- 7.5 - IA2 Provide mechanisms to facilitate protection of high value privately-owned wetlands, such as through conservation easements and tax reductions.
- 7.5 - IA3 Take appropriate administrative actions to protect high-value wetlands on public lands, such as formally designating greenbelts along selected anadromous fish streams.
- 7.5 - IA4 For Category A and B and other high-value wetlands on private lands, provide for the consideration of the wetlands classification and any history of development permit denials during property tax calculations conducted by the CBJ Assessor.
- 7.5 - IA5 Provide flexibility in residential and non-residential development standards, including density standards, to allow developments to be designed to minimize impacts to wetlands and stream habitats, such as through cluster development, transfer of development rights to select receiving areas, and conservation easements.
- 7.5 - IA6 Develop and maintain a computer database and GIS mapping capability to map and track locally-issued permits, wetlands acreage developed under CBJ permits, mitigation required, mitigation success, and enforcement actions.
- 7.5 - IA7 Assure adequate staffing in CDD to monitor enforcement of mitigation measures and plans to ensure that projects comply with approved plans and conditions placed on local wetland permits. Work actively to enforce violations.

7.5 – IA8 Update the *Juneau Wetlands Management Plan* and Implementation Program to:

- A. Clarify and strengthen the regulations for high value wetlands;
- B. Increase permit predictability to wetlands owners,
- C. As much as is practicable, to make CBJ valuation methodologies and classifications consistent with those of relevant state and federal agencies and the Army Corps of Engineers; and
- D. Update existing wetland maps and expand the geographic areas of the wetlands inventory and delineation area to include the areas included in the Urban Service Area, identified in this *Comprehensive Plan* Update, for new development to the year 2033.

POLICY 7.6. TO RETAIN ALL CBJ-OWNED CATEGORY A AND B WETLANDS IN CBJ OWNERSHIP AND TO MANAGE THEM FOR ENVIRONMENTAL PROTECTION AND PUBLIC EDUCATION. HOWEVER, WHEN DEVELOPMENT OF SUCH WETLANDS HAS BEEN DEEMED BY THE CBJ ASSEMBLY AS NECESSARY FOR THE OVERALL HEALTH, SAFETY, AND/OR WELL-BEING OF THE COMMUNITY, SUCH DEVELOPMENT MAY OCCUR WHEN ADEQUATE MITIGATION OF THE LOSS OF SUCH WETLANDS IS PROVIDED.

Implementing Action

- 7.6 - IA1 Identify select degraded wetlands on CBJ lands or on private property with portions of impaired anadromous fish streams as receiving or target restoration lands, water bodies and resources for Mitigation Bank purposes.

Water Quality

Within the borough, significant sources of adverse impacts to water quality are “non-point sources” of pollution to surface and groundwater resources. Non-point sources are broad, diffuse sources of pollution or activities that release harmful wastes by being spilled, leaked, leached, eroded, or dumped onto land or into the water. Non-point source pollutants can include soil sediment, hydrocarbons, fecal coliform bacteria, heavy metals, and other pollutants that are generated through stream bank or upland erosion, urban runoff, off-site sewage system leach-fields, and other common features of our urban and rural landscapes.

These non-point sources are distinct from “point sources” of pollution that are traceable to distinct operations or activities that include manufacturing, industrial activities, and large private and public facilities such as waste water treatment plants. These point sources are currently managed by Federal Environmental Protection Agency (EPA) and State of Alaska Department of Environmental Conservation (DEC) permits.

To effectively protect water quality, the CBJ must control non-point source pollutant sources primarily through land use controls and Best Management Practices (BMPs) applied to development projects and business operations during the permitting process. Non-point source controls and BMPs affect where a development is located, and how it is constructed and operated. Examples of these controls include selecting a project site that is over 50 feet from open water or that avoids wetlands; placing siltation fences around construction sites; constructing a retaining dike around fuel storage or fueling areas; installing an oil/water separator on storm drains for roads and parking lots; and/or careful storage of snow near drainage systems or anadromous fish streams.

Failure of on-site waste water systems at times has required that the CBJ government to remedy unsafe situations at great expense to taxpayers. It is estimated that extending sewer systems to rural areas requires local taxpayers to subsidize about 80 percent of the costs of these improvements.

Since 1988, the provision of public sewer utilities to additional areas within the Mendenhall Valley (Mendenhall Loop Road) and North Douglas areas has helped to resolve localized surface and groundwater quality problems formerly caused by failed on-site septic systems. Even more recent sewer service extension to the Industrial Boulevard and additional North Douglas areas will further reduce on-site sewage treatment and the potential for water quality impacts.

The Federal Clean Water Act requires that every two years the Alaska Department of Environmental Conservation (DEC) identify, rank, and assess water bodies with persistent water quality problems. Impaired waters, for which conventional technology-based water quality controls are not expected to bring the water quality into compliance with state water quality standards, may be subject to Total Maximum Daily Load (TMDL) allocations for pollutants. This means that DEC determines the maximum amount of various pollutants that can be in the stream without violating water quality standards, and allocate a proportion of that pollutant load to each pollutant source. This type of allocation process can result in extremely stringent development controls in TMDL watersheds.

DEC continues to review water bodies that fail to meet state water quality standards. The list of impaired water bodies is updated every two years. Table 3 lists the five 2011-designated impaired water bodies within the City and Borough of Juneau.

The CBJ government has entered into a Memorandum of Agreement (MOA) with DEC to cooperate in preparing water quality assessments and watershed recovery plans. The mutual goal is to improve the water quality in these listed streams such that they will comply with state water quality standards and be removed from the impaired listing. It is essential that effective plans be implemented to improve the water quality in the impaired streams--both to improve our natural water resources and the fisheries that they support, as well as to avoid the extremely restrictive development controls that the Federal Clean Water Act will impose if the impairment is not remedied.

Given these important water quality issues, it is appropriate to address them in a comprehensive planning and land use management context.

IMPAIRED WATER BODIES WITHIN THE CITY & BOROUGH OF JUNEAU, 2011

<i>Water Body</i>	<i>Impaired Category</i>	<i>Pollutants</i>	<i>Sources</i>
Duck Creek	4a	Dissolved oxygen, debris, metals, fecal coliform, habitat modification, turbidity	Urban runoff, landfill, road runoff, land development
Jordan Creek	4a	Residues, Dissolved gas and sediment	Urban runoff
Lemon Creek	4a	Turbidity, sediment, habitat modification debris	Urban runoff, gravel mining
Pederson Hill Creek (aka Casa del Sol Creek)	4a	Turbidity, fecal coliform, petroleum products, habitat modification, sediment	Urban runoff, failing on-site waste water systems
Vanderbilt Creek	4a	Turbidity, debris, sediment, habitat modification	Urban runoff

Table 7.1

Stormwater Management

Non-point source pollutants are carried from their source to the streams by stormwater. Stormwater is the water from rainfall or snow melt that flows across the land surface to a receiving water body. From the point on which it hits the land, it travels a course that eventually leads to streams or lakes and eventually to the ocean. As the water moves across the land, it dislodges and picks up sediment and pollutants. Stormwater management is the control of these pollutants before they enter the stream systems. It is also an effort to reduce erosion, which in turn decreases the amount of sediment entering and filling the streams. The goal of stormwater management is to

filter out as many of the pollutants and sediments from the stormwater before they enter the receiving water body and to reduce erosion and pollutants. Natural stream bank buffers, riparian vegetation and wetlands are excellent storm water purifiers and excel in removal and assimilation of sediments and pollutants.

Any activity that alters the natural vegetation and features of the land surface tends to alter the stormwater runoff characteristics. Traditionally, urban development has been the largest factor in increased stormwater runoff problems. The problems are directly tied to runoff quality, quantity and velocity. Methods employed to increase percolation of surface water into the ground will reduce the amount and speed of flow when it enters the streams. Likewise, natural or mechanical filtering of the water before it enters the streams helps improve the water quality and, thus, helps protect the habitat.

Stormwater runoff from urban development and construction sites is one of the leading contributors of degradation of water quality and habitat in streams and lakes nationwide.

In the past, the CBJ government has made an effort to reduce stormwater pollutants and sedimentation on a case-by-case basis. However, there are currently five streams that are listed by DEC as impaired water bodies in the borough, and more effective methods and procedures are necessary in order to address this problem.

POLICY 7.7. TO PROTECT, MAINTAIN AND IMPROVE SURFACE WATER, GROUNDWATER AND MARINE WATER QUALITY IN ITS JURISDICTION SO THAT ALL WATERS ARE IN COMPLIANCE WITH FEDERAL AND STATE WATER QUALITY STANDARDS AND CONTINUE TO ALLOW AQUATIC LIFE TO THRIVE.

Standard Operating Procedures

- 7.7 - SOP1 Coordinate the various *Comprehensive Plan* sections that affect water quality (stream management, wetlands, domestic watersheds, open space/natural areas) to ensure that implementing actions protect and maintain surface and groundwater quality.
- 7.7 - SOP2 Participate with the State of Alaska Department of Environmental Conservation (DEC), the federal Environmental Protection Agency (EPA), and other relevant regulatory organizations in the development and implementation of water body management and recovery plans for the listed impaired water bodies within the City and Borough of Juneau, including use of Best Management Practices for protection and improvement of water quality.
- 7.7 - SOP3 Coordinate with relevant regulatory organizations when reviewing projects for local approvals (e.g., subdivisions, land use permits, variances), planning CBJ projects (e.g., gravel mining, land disposals), or conducting enforcement in the impaired watersheds.
- 7.7 - SOP4 Cooperate with relevant regulatory organizations in monitoring permit conditions, permit compliance and watershed restoration in impaired water bodies.
- 7.7 - SOP5 Incorporate the goal of protecting and improving water quality into the planning, site selection, budgeting, design, and construction of CBJ government- and state-sponsored capital projects with consideration of watershed management plans when available.
- 7.7 - SOP6 Consult with private landowners, industry, and the public, including groups such as the Juneau Watershed Partnership, regarding cooperative approaches to improving water quality in the impaired watersheds.

Development Guideline

- 7.7 - DG1 Ensure that stream corridors, surface waters, and associated riparian buffer areas receive greater attention in the local permitting process through adherence to the most recent version of the CBJ *Manual of Stormwater Best Management Practices* (BMPs) and adoption of additional requirements or criteria that protect these areas and waters if needed. One of those BMPs is the appropriate removal and storage of snow in residential subdivisions and commercial developments. Snow should be stored away from streams, preferably in upland areas where good vegetation will trap excess sediment before entering stormwater systems or waterways. This is particularly important where large surface areas are plowed, such as on airport property or parking lots near anadromous fish streams.

Implementing Actions

- 7.7 - IA1 Provide snow storage areas throughout the Urban Service Area, each containing a filter settling basin to reduce the amount of sediment entering local drainage systems and water bodies.
- 7.7 - IA2 Map the impaired watershed areas and their associated drainage systems on the CBJ GIS system and the Land Use Code Maps to ensure that they are accorded special attention when reviewing permit applications.
- 7.7 - IA3 Coordinate with relevant regulatory organizations in the development and implementation of water body management and recovery plans for the listed impaired water bodies within the borough, including use of Best Management Practices for protection and improvement of water quality.
- 7.7- 1A4 During the permit process, educate private property owners about Best Management Practices related to snow storage, and help define snow storage areas within private properties.

Watersheds

Water supplies for domestic uses in Juneau are a limited resource. The existing domestic water sources are the Gold Creek/Last Chance Basin and the Salmon Creek watersheds. The *Watershed Control Program—Salmon Creek Source* (1993), and the *Watershed Control and Wellhead Protection Program—Gold Creek Source* (1994) were adopted as part of the CBJ *Comprehensive Plan* to provide guidelines for the protection of the domestic water supply. In addition, the *1994 Update—Last Chance Basin Land Management Plan*, which guides land use activities for the protection of the Gold Creek water source, was also adopted by the CBJ. The 2012 *DRAFT AJ Mine Related Water Study* discusses the status of the Gold Creek water source in 2011-12 and investigates potential system improvements, including other drinking water sources.

Steps must be taken to assure that sufficient high-quality water will be available for future domestic users. Existing and potential sources should be protected from degradation of quality and quantity. Of particular concern is the long-term availability of potable water for future growth areas in Auke Bay, the Mendenhall Valley and on Douglas Island.

POLICY 7.8. TO PROTECT WATERSHED AREAS THAT ARE, OR POTENTIALLY COULD BE, DEVELOPED FOR DOMESTIC WATER SUPPLIES TO PROVIDE AN ADEQUATE SUPPLY OF CLEAN, SAFE DRINKING WATER.

Standard Operating Procedures

- 7.8 - SOP1 Evaluate the potential of local watersheds for surface or groundwater development of municipal water supplies.
- 7.8 - SOP2 Implement the *Watershed Control and Wellhead Program—Gold Creek Source* (1994), the *Watershed Control and Wellhead Program—Salmon Creek Source* (1993) and the *1994 Update—Last Chance Basin Land Management Plan* for the protection of Juneau's municipal water supply.
- 7.8 - SOP3 Certain lands within the borough serve as watersheds for potable water supplies and/or potential potable water supplies. The CBJ government should continue to designate those lands as Watershed protection areas on the Land Use Maps of the *Comprehensive Plan* and should limit and control development therein.

Development Guidelines

- 7.8 - DG1 Regulate all development proposals and major activities in watershed areas that have high potential for development as a municipal water source to ensure maintenance of high quality water. Regulate direct discharge from storm-water control devices into designated watershed areas.

7.8 - DG2 Prohibit filling or draining of wetlands, bogs and muskegs in designated watershed protection areas if it is shown that such activity could result in degradation of water quality.

7.8 - DG3 Only permit development that would not result in degradation of water quality.

Implementing Actions

7.8 - IA1 In order to protect water quality in watershed areas:

1. Establish Best Management Practices (BMPs) for land use activities permitted within the watershed protection areas that would prevent or mitigate degradation of the watershed habitat or surface or ground water quality from the use of pesticides, fertilizers or other chemicals;
2. The introduction or maintenance of invasive species should be prevented by the prohibition of sale or importation of such species, particularly in seed mix associated with ground stabilization projects; and,
3. Plant retailer and suppliers; contractors; property owners; the CBJ, state, and federal governments; and organizations such as the Alaska Association of Conservation Districts which work directly on eradication and control of invasives should post notices and illustrations for the public to understand which plant species are invasive and how to properly eradicate them.

7.8 - IA2 Support an effort to map those portions of watersheds that could be a source for domestic water in the CBJ GIS system and adopt appropriate protections for those new watersheds. Development of new water sources for West Douglas Island will need to progress with development of the West Douglas New Growth Areas; other new water sources, particularly for Auke Bay, the Mendenhall Valley, and North Douglas will likely be required after 2025.

7.8 - IA3 The City Manager should assign a CBJ agency or division to monitor water quality, particularly within watersheds, and coordinate enforcement activities with state and federal land management and regulatory agencies.

Air Quality

Air quality refers to the quality or purity of the air we breathe, the quality of the air we see and see through, as well as the absence of harmful, nuisance or annoying sounds or odors that are transmitted through the air.

Although breathable and visible air quality in the CBJ area has generally been high, it can be a serious problem in some areas of concentrated burning of fire places, wood-stoves, outdoor burning of refuse, and the increase of engine emissions from vehicles, cruise ships and aircraft. The Mendenhall and Lemon Creek Valleys are the areas most seriously affected by breathable air pollution, due to air inversions during the winter months. The CBJ has adopted air quality control regulations that prohibit wood-stove burning during periods of poor air quality, provide for emission standards for new wood-stoves, prohibit open burning during the winter, and require construction of energy- efficient single-family homes. The CBJ has also enacted laws to regulate open burning. Another significant effort being made to assure compliance with air quality regulations is through the program to pave residential streets to control dust. As a result of these efforts, the CBJ's air quality is relatively good most of the time.

Noise is a significant problem during the summer season when flightseeing aircraft pass above public waterways, parks, trails, and residential areas. The volunteer Tourism Best Management Practices Program (TBMP) seeks to minimize noise impacts from float planes and helicopters, but noise impacts from these non-stationary sources are difficult to control and whether the noise is noticeable, annoying or a nuisance is subjective, and varies from person to person and situation to situation. In neighborhood outreach meetings in the Douglas Island and Mendenhall Valley areas as part of the 2009 Plan Update, residents testified that the noise from numerous flightseeing aircraft during the summer remains annoying despite the efforts of the TBMP. Similarly, commercial kennel facilities are difficult to locate due to noise from barking dogs. In dense, urban areas such as downtown Juneau, some residents complain of noise from stationary sources such as adjacent or nearby commercial cooler and air conditioning units that click on and off 24-hours a day.

Overall, it is appropriate for the CBJ government and community to remain concerned with air quality, including noise levels.

POLICY 7.9. TO CONTINUE EDUCATIONAL PROGRAMS, CAPITAL IMPROVEMENT PROJECTS, AND REGULATORY MEASURES TO PROTECT AND IMPROVE OVERALL AIR QUALITY.

Standard Operating Procedure

- 7.9 - SOP1 Cooperate with the Alaska Department of Environmental Conservation (DEC) in implementing CBJ 36.40 regarding regulation of pollution from wood stoves and outdoor burning.

Implementing Actions

- 7.9 - IA1 Undertake public transit improvements to reduce congestion and encourage residents to utilize non-fossil-fuel dependent forms of transportation. This would include replacing public and private bus fleets with vehicles that operate on non-fossil fuels, such as batteries that can be recharged with renewable energy sources.
- 7.9 - IA2 Establish a CBJ agency or Division within an existing Department that would monitor air quality and would work with state and federal regulatory agencies and stay abreast of air quality issues, concerns and technology.
- 7.9 - IA3 Consider establishing limits on, or otherwise regulating, CO2 emissions in the borough.

Noise

An increasing problem in Juneau, the most significant sources of noise are: the airport; flightseeing operations throughout the borough, but especially near heliports and at the downtown seaplane base; gravel quarrying; loading and unloading activities at marine transfer stations; and vehicle traffic. Other noise sources include stationary equipment such as machine motors, parties, car alarms, barking dogs, fireworks, shooting, snow removal, refuse pick-up, and even children playing outside can be annoying depending on the sensitivity of the observer, the time of day, and the context of the noise. Noise is any objectionable, annoying, nuisance or harmful sound, although it is subjective to the receptor (person). The absence of noise, characterized as “peace and quiet,” has become a recognized asset and value to community well-being. Some significant advances are being made in the reduction of noise at its source, but noise cannot be eliminated completely. Local, state, and federal agencies, in recognition of this fact, have developed guidelines and procedures to deal with noise in the community land use planning process.

The purpose of considering noise in a comprehensive plan and in the regulation of development is not to prevent development but to encourage development in locations that are compatible with various noise levels. The objective is to guide noise-sensitive land uses away from noise sources and to place tolerant land uses where there is noise. For example, homes, schools and hospitals should not be located near airports, but industrial uses are typically not adverse to aircraft noise. Where this separation of compatible and non-compatible land uses is not possible, measures should be included in development projects to reduce the effects of noise. For example, office buildings located within or near aircraft noise contour areas should be constructed with air conditioning and double- or triple-paned windows, rather than single-paned, operable windows for ventilation.

The primary responsibility for integrating noise consideration into the planning process rests with local government. Noise, like soil conditions, floodplains and other considerations, is a valid land use determinant. Scientific evidence clearly points to noise as not simply a nuisance but also an important health and welfare concern.

POLICY 7.10. TO MINIMIZE THE EXPOSURE OF RESIDENTS TO THE HARMFUL EFFECTS OF EXCESSIVE AND/OR OBTRUSIVE NOISE, AND TO CONTROL THE LEVEL OF NOISE POLLUTION IN A MANNER THAT WILL BE COMPATIBLE WITH COMMERCE AND PUBLIC SAFETY, THE USE, VALUE, AND ENJOYMENT OF PROPERTY, SLEEP AND REPOSE, AND THE QUALITY OF THE ENVIRONMENT.

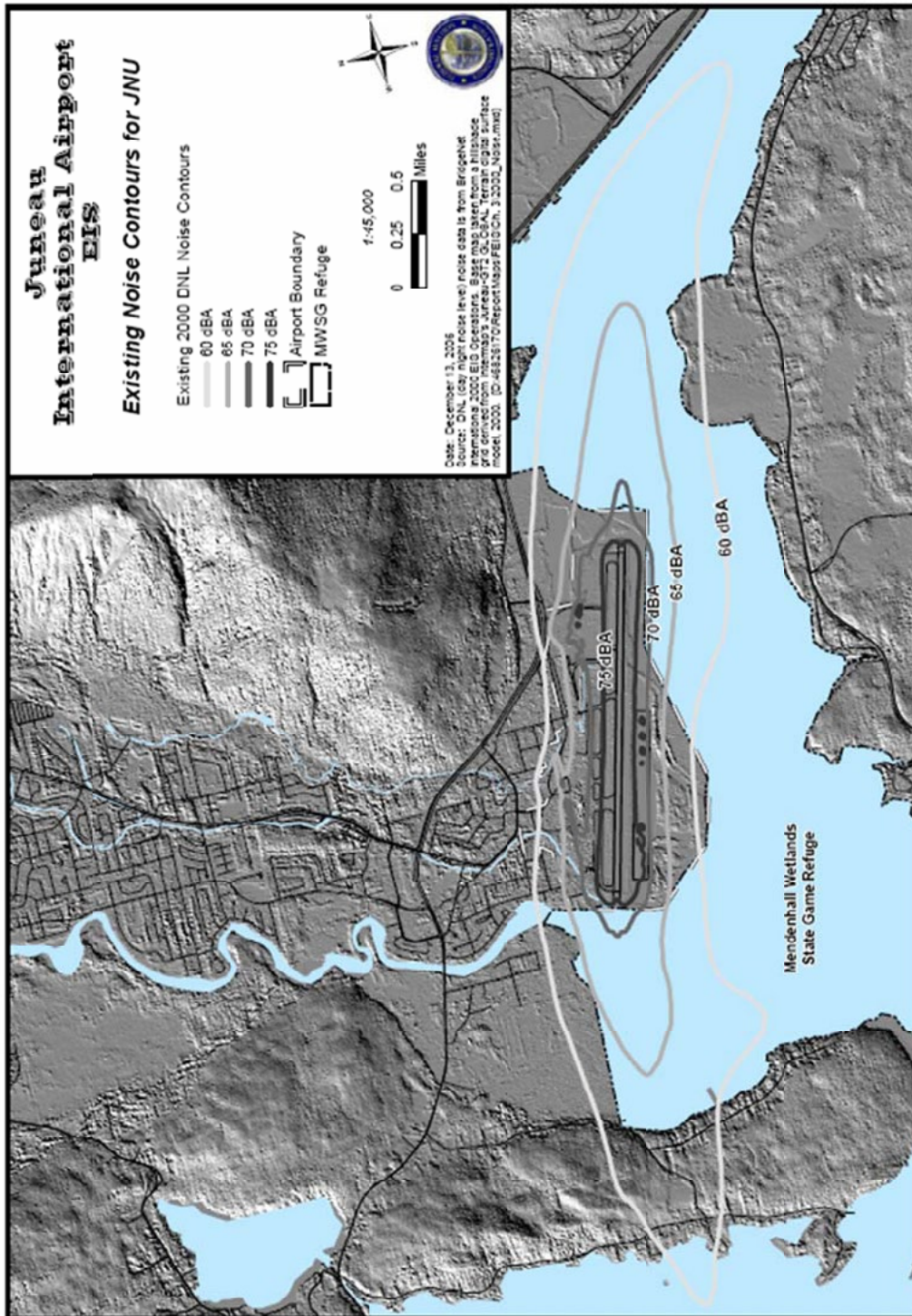
Standard Operating Procedures

- 7.10 - SOP1 Establish land use patterns that minimize the effects of high-noise generators, particularly in the airport vicinity or near other aircraft landing facilities, near industrial zones, along major traffic corridors, near shooting ranges and off-road-vehicle tracks, and other similar noisy environments.
- 7.10 - SOP2 Consider noise mitigation when reviewing new roadway improvements. Require berms, sound walls and/or planting strips along highways and major arterials in noise sensitive areas where the CBJ owns the roadway. Encourage the Alaska Department of Transportation and Public Facilities (ADOT&PF) to leave or provide dense vegetation along state roadways through residential areas to absorb traffic noise and dust.
- 7.10 - SOP3 Provide leadership in implementing the CBJ “Fly Neighborly Program,” an aircraft operator-supported, self-policing program intended to observe and improve an existing voluntary noise abatement program. Should this volunteer program not satisfy noise concerns of the public, a local noise control ordinance should be developed to require mandatory controls and measurable and enforced mitigation measures per 7.10 -IA1.

Implementing Actions

- 7.10 - IA1 Adopt a Borough-wide and/or subarea-specific noise ordinance(s) to provide a mechanism for addressing noise complaints and to ensure that new development does not result in noise complaints.
- 7.10 - IA2 Adopt the guidelines developed in the *Juneau International Airport Master Plan* into the Land Use Code to manage aircraft--generated and airport-related noise impacts on surrounding development, consistent with Federal Aviation Administration (FAA) regulations and local regulations.
- 7.10 - IA3 Consider establishing a new Noise Notification Overlay District that encompasses lands near enough to be affected by uses known to generate nuisance noise, such as: gravel extraction areas, landfill sites, outdoor shooting ranges, airports and heliports. Within this overlay district, property owners should be required to notify prospective tenants and/or purchasers of the presence of these land uses and their potential noise impacts. Also consider amending Title 19, the Building Code, to require adequate noise mitigation in building design and construction within this overlay district.
- 7.10 - IA4 Establish special noise attenuation features in the local building code for new construction of habitable structures within areas demonstrating high ambient noise levels of, such that habitable buildings are constructed with materials and by design to attain an interior noise level considered safe and healthy.
- 7.10 - IA5 Initiate development of a Borough-wide or subarea-specific noise control ordinance when noise complaints or other indicators indicate increasing noise pollution and/or community sensitivity to nuisance noise. Such a specific-area noise control ordinance should establish maximum environmental noise levels applicable within designated areas of the CBJ for both stationary (typically equipment, sound systems) and non-stationary noise sources (typically vehicles, human or animal noise).

AIRPORT NOISE CONTOUR MAP*



Map 7.1

Source: Juneau International Airport FEIS, Figure 3-3 *This map does not show the expanded Runway Safety Area or its effects on the Noise Contour. Higher noise contours exist to the east and west of the airport.

Habitat Protection

The forests, wetlands, lakes, streams and marine waters within the City and Borough of Juneau are part of a habitat network for fish and wildlife. Each of these areas supports a unique variety of animals. Urbanization often results in habitat fragmentation and degradation, causing long-term damage to animal populations.

The major aquatic habitat types in the borough are: coastal marine waters, intertidal flats, estuaries, fresh and saltwater wetlands, creeks, rivers and lakes. These areas contain critical spawning and rearing habitat for many marine species, including salmon, trout, char, herring, halibut, rockfish, clams, mussels, and crab, not to mention the invertebrates, macro-invertebrates, and other species upon which they depend for food.

Historic development has been accompanied by grading, filling and channeling of waterways, interception and alteration of ground and surface waters, and pollution of the waterways and adjacent riparian habitat. This has caused the degradation of streams and fish resources in the CBJ area. Among the streams most seriously affected, and listed as impaired by the State of Alaska Department of Environmental Conservation (DEC), are Duck, Lemon, Jordan, Vanderbilt and Pederson Hill (aka Casa del Sol) Creeks. Those that retain important fish resource values are listed in the CBJ-adopted list of Anadromous Fish Streams and include, among others, the creeks, rivers and lakes with anadromous fishery resources of Cowee, Bridget, Peterson, Tee, Lena, Auke Nu, Waydelich, Auke, Bay, Lake, Montana, McGinnis, Switzer, Lemon, Salmon, Falls, Fish, Windfall, Lake, Steep, Sheep, Neilsen, Grant, Eagle, Kowee, Lawson, Bear, Ready Bullion, Bullion, Nevada, Middle, Hilda, and Petersen Creeks, the Mendenhall, Herbert, and Eagle Rivers, and other named and unnamed creeks.

A prevalent upland habitat type in the borough is the coniferous forest; it also is an important economic asset to the region. Much of this forest habitat is within the Tongass National Forest and is controlled by the U.S. Forest Service. The location and scale of timber harvest can affect the type and amount of fish and wildlife habitat.

Sitka Black-tailed Deer is an important game species whose populations are limited by the availability of wintering habitat. Optimal wintering areas, which are predominantly located in portions of old growth forests, have been identified on Douglas Island and around Lemon Creek. The loss of wintering habitat or the intrusion of human activities and domestic animals lowers the maximum deer population that can be sustained. Two other species, Stellar sea lions and Bald Eagles, have unique requirements because of the Marine Mammal Protection Act, the Endangered Species Act (Stellar sea lions), the Migratory Bird Treaty Act, and the Bald and Golden Eagle Protection Act (Bald Eagles). They are therefore treated separately following this section, as are bears.

In addition to their ecological importance, and in some instances to their value as food sources, fish and wildlife populations of the borough are an important natural amenity valued by residents and visitors alike. Some species, such as salmon and herring, are deemed “indicator” and/or “keystone” species and warrant extra attention by regulatory and management agencies. Indicator species populations are easily and routinely monitored; changes to their population over time provide an indication of the health of their entire ecosystem. Herring and salmon can both be considered indicator species because their populations are monitored by the Alaska Department of Fish & Game on a regular basis, and as middle-level predators, their populations can indicate the health of the entire ecosystem. Keystone species are crucial to the health of the entire ecosystem; many other species in the ecosystem depend on keystone species to survive, directly or indirectly. Herring are a keystone species in the Inside Passage, because many predators depend on them for food.

Monitoring the health and viability of the habitat of the indicator species, particularly the spawning habitat, will guide us in developing specific interventions to avoid or minimize harmful impacts to that habitat (such as the use of Best Management Practices); this, in turn, will benefit all the species that use that habitat. As herring are both a keystone and an indicator species in Juneau, protecting their habitat is of great importance to the ecosystem as a whole and to the economy of the borough and the Southeast Alaska region due to their relationship with other commercially-harvested species.

Even simple Best Management Practices (BMPs), such as avoiding the introduction and pursuing the eradication of invasive plant species in our yards and gardens, can be critical in protecting the health of our environment.

POLICY 7.11. TO PRESERVE AND PROTECT A DIVERSITY OF FISH AND WILDLIFE HABITAT THROUGHOUT THE CBJ.

Standard Operating Procedure

- 7.11 - SOP1 Urge property owners to protect fish and wildlife habitats, streams and wetlands when designing development projects. Encourage clustering, buffer zones, conservation easements and other design alternatives that could protect fish and wildlife habitat.
- 7.11 - SOP2 Include protection of important fish and wildlife habitats in Capital Improvement Programs and land use planning.
- 7.11 - SOP3 Consult with DEC, ADF&G, NMFS, and any other potentially interested state or federal resource agency in drafting land use regulations and plans, as well as in permit review for any development that could impact fish or wildlife habitat. Be especially deferential to agency comments on draft regulations, plans, or development permits that could affect herring spawning areas, especially along the east shore of Lynn Canal, Auke Bay, and Gastineau Channel.

Implementing Actions

- 7.11 - IA1 Develop a GIS database to identify natural resources, fish and wildlife habitats, riparian corridors and wetlands. Develop a GIS-based Critical Wildlife Habitat map in cooperation with the Alaska Department of Fish and Game, the Fish and Wildlife Service, and the U.S. Forest Service as an overlay to the Land Use Code maps. Use this map as a guide in managing and protecting these areas and in identifying un-fragmented fish and wildlife corridors aligned along anadromous fish streams from the icefield to the sea.
- 7.11 - IA2 Protect important fish and wildlife habitat and assure fauna's access to quality habitat, using a wide variety of tools, including but not limited to: education, incentives (such as conservation easements and tax abatement), development regulations, private donations, tax reductions on lands with conservation easements, or public acquisition. Vary the use of management techniques based upon the size, location, vulnerability, and relative abundance of the fish and wildlife habitat.

Invasive Species

The CBJ, along with state and federal resource agencies and local non-profit organizations, has established a Juneau Cooperative Weed Management Area (JCWMA) to cooperatively address the rapidly escalating invasive species problem in Juneau. The JCWMA has established an ABC list of 20 invasive plants which have been ranked according to the extent of the weed infestation, how rapidly the weed spreads, and the availability of practical measures to bring the infestation under control. Some species have been targeted for prevention or control, while other species have been targeted for full eradication. Invasive species may have serious economic effects as well as biological effects. For example, reed canary grass has destroyed salmon runs in other areas of Alaska by choking the streambed with excessive growth. If left unchecked, invasive species could negatively impact the fishing, tourism, and recreation industries, in addition to aesthetic damage to local parks and trails. The top ten invasive species in Juneau, according to the JCWMA, are: bohemian knotweed, Japanese knotweed, purple loosestrife, reed canary grass, ornamental jewelweed, orange hawkweed, yellow-meadow hawkweed, Canada thistle, European bird cherry, and bird vetch.

POLICY 7.12. TO PROTECT LOCAL BIODIVERSITY, INCLUDING NATIVE FLORA AND FAUNA, FROM INVASIVE SPECIES.

Implementing Actions

- 7.12 - IA1 The CBJ government should fund or otherwise support a study of the effects of climate change on the potential for invasive species to immigrate to and thrive in the borough, to the detriment of native species. If this study identifies potential harmful effects of invasive species, the CBJ government and community should undertake aggressive measures to prevent and eliminate this infestation hazard.

- 7.12 - IA2 The CBJ should fund or help fund a Borough-wide study of invasive plants to produce an inventory and maps of existing locations of invasive plants on, at least, CBJ-owned lands. This study should include the following elements: (1) development of a priority list of invasive plant species to be targeted for control and eradication throughout the CBJ and a five to ten year plan for achieving that goal; (2) development of a CBJ team within an existing Department or to a contracted non-profit group to coordinate the implementation of that eradication program; (3) development of a prevention plan to identify and address sources of invasive plant species; (4) development and implementation of a public education program to promote awareness of the impacts of and methods to eradicate invasive plant species and to urge retailers not to sell invasive species or to prohibit them from selling them; (5) development of new land use controls to require private property owners to eradicate, or to prevent introduction of invasive species on their property as part of review and approval of new building or grading permits; and (6) designation of a secure site and procedures for safe disposal of pulled or cut invasive species.

Stellar Sea Lion Habitat

The Stellar sea lion, while apparently healthy in Southeast Alaska, has been listed as threatened in Alaska. Benjamin Island, in Favorite Channel between the Eagle River and Bridget Cove, is a major Stellar sea lion haul-out. The island has supported as many as 227 sea lions at one time, according to the 1991 Recovery Plan for the Stellar sea lion prepared by the National Marine Fisheries Service. The primary sea lion haul-out is on the northwest shore of Benjamin Island; however, sea lions use the entire periphery of the island. Major haul-outs such as that on Benjamin Island are considered critical habitat for the species. It is one of only 19 known major (supporting over 200 sea lions) sea lion haul-outs in Southeast Alaska. The site is a popular local sea lion viewing destination and is of growing interest to visitors. Stellar sea lions consume seasonal prey, such as herring, cod, salmon and eulachon, as well as year-round prey, such as pollock, cephalopods, mackerel, flounder, rock sole and sand lance. Threats to the mammal include intentional killings by fishermen, competition with commercial fisheries resulting in reduced prey from over-fishing, toxic substances in sea water and prey, ingestion of fishing tackle and other debris, disturbance of fishing areas and rookeries by vessel traffic and tourism, and predation by killer whales.

POLICY 7.13. TO PROTECT AND PRESERVE THE AREAS ON BENJAMIN ISLAND IDENTIFIED AS CRITICAL STELLAR SEA LION HABITAT.

Standard Operating Procedure

- 7.13 - SOP1 Consult with the National Marine Fisheries Service (NMFS) on all development proposals, including commercial marine and aircraft fish and wildlife viewing that could affect sea lions' use of the island.

Development Guideline

- 7.13 - DG1 Consult with the NMFS and prohibit development that would interfere with critical sea lion habitat including their haul out.

Implementing Action

- 7.13 - IA1 Identify on the CBJ GIS and Land Use Code Maps the publicly and privately-owned land and water areas identified as critical sea lion habitat in the *Stellar Sea Lion Recovery Plan* published by the NMFS.

Eagle Nesting Areas

Bald eagles are present in the CBJ area in large numbers. Alaskan bald eagles are not an endangered or threatened species, but they are subject to the Bald and Golden Eagle Protection Act of 1940 and the Migratory Bird Treaty Act of 1918. Shoreline areas and old growth forest habitat are prime nesting areas. The U.S. Fish and Wildlife Service (USFWS) recommends a non-buildable buffer zone of at least 330 feet around known eagle nests and retention of shoreline habitat in this vicinity to a depth of one-eighth mile, although certain development activities can occur within the 330-foot buffer zone without risk of violating either federal act, if care is taken in those activities. In 2011, the USFWS started issuing permits that allow disturbance of bald eagles, including the destruction of nests in some instances.

Locally, adequate protection can be given to this species by protecting nesting areas from conflicting land uses and human activity. An ordinance protecting eagle nests has been codified in the Land Use Code and prohibits construction within 330 feet of an active nest on public land, or within 50 feet of an active nest on private land, provided that there is no construction within 330 feet of such nest between March 1st and August 31st if it contains actively nesting eagles. It may be appropriate to revise this ordinance, in light of changes to federal policy regarding disturbance of eagles.

There is a generally held perception that the local population of bald eagles is increasing which, if true, may be attributable to an increase in fish in the area and/or a higher-than-expected tolerance of these birds to human presence. In any case, the eagles are still subject to special protection by law and enjoy considerable local affection.

POLICY 7.14. TO PROTECT AREAS SURROUNDING IDENTIFIED EAGLE NESTS FROM CONFLICTING LAND USES.

Standard Operating Procedures

- 7.14 - SOP1 Mature trees that, typically, are suitable for eagle nests should be retained within 1/8th of a mile of the coast.
- 7.14 - SOP2 In situations where lands are proposed for private platting next to CBJ-owned lands, and if the private party is willing, the CBJ government will consider exchanging land of equal value for those lands within 330 feet of the eagle nest tree and retain it as an eagle management area.
- 7.14 - SOP3 Prohibit the cutting of trees near shoreline areas for the purpose of eradicating nesting eagles or of preventing eagles from nesting therein.

Development Guideline

- 7.14 - DG1 Private land within the eagle management radius should be left undeveloped or subdivided into large lots, the largest of which should contain the nest tree. Roads should be located as far from the nest as possible, preferably landward from the nest tree. Low density residential or open space/natural areas uses should be located within the eagle management radius.

Implementing Actions

- 7.14 - IA1 Amend the Land Use Code to include variance criteria that apply specifically to requests to allow development within the buffer area around a bald eagle nest. Developing these criteria is of crucial importance in order to allow responsible development within 330 feet of eagle nests, especially those nests that post-date adjacent development. It may be appropriate to adopt regulations for development near eagle nests based on the level of tolerance of the subject eagles to human activity.
- 7.14 - IA2 Work with the United States Fish and Wildlife Service (USFWS) on an as-needed basis to identify eagle nest locations and best practices.
- 7.14 - IA3 Consider designating as Natural Areas or other low impact land use categories areas where eagles tend to nest in concentrations.
- 7.14 - IA4 Request that the USFWS evaluate the Bald Eagle in the Urban Service Area in terms of population, behavior and tolerance of human presence and activity. Consider any new suggestions from the USFWS for enhancing the presence and health of eagles in the urban area.
- 7.14 - IA5 Support the efforts of a local non-profit eagle rehabilitation facility to rescue, heal and return to the wild, injured or vulnerable eagles and to educate the public as to the health and well-being of the species.

Bear Protection

A recurring problem that may grow as more of the CBJ becomes developed is the tendency of bears to become food-conditioned to human-generated garbage. Many developed areas of the borough sit astride traditional bear pathways or are adjacent to bear habitat. The clear indication is that once a bear becomes conditioned to eating

garbage, it is likely to continue pursuing human-related food items. Given a food reward, normally shy bears become more and more comfortable around homes and people, which often lead to conflicts with people and their property and eventually results in the death of the bear.

Changes to laws regarding garbage storage have resulted in a significant decrease in bear-related complaints to the Juneau Police Department (JPD) and the Alaska Department of Fish and Game (ADF&G). Throughout the borough, refuse containers are now required to be bear resistant unless they are kept indoors (CBJ 36.20.056). In addition, garbage cans may not be put on the curb until after 4:00 AM on the day of pickup, and all dumpsters must have either metal locking lids or be kept in bear resistant enclosures. Arrow Refuse began using roll-carts for residential waste collection in the spring of 2012; these cans are not bear-resistant containers, although many Juneauites have mistaken their locking lids for bear-proof devices. Municipal trash receptacles are bear-proof. All of these changes, with the exception of new cans that are erroneously perceived as being bear-resistant, have resulted in fewer bear/human conflicts simply by making it more difficult for bears to access human food waste.

ADF&G coordinates closely with the JPD regarding bear incidents. The JPD patrol officers inform the JPD Community Service Officers (CSO) about bear problem locations so that CSO's can follow up with closer monitoring of garbage storage at those locations. CSO's issue tickets to property owners who do not comply with laws on garbage storage. This enforcement has made a huge difference in getting the attention of community residents and lessening the number of human/bear conflicts.

In addition, the CBJ government, along with the ADF&G and the United States Forest Service, have teamed up to sponsor the "Alaska Bears in Communities" program that provides bear education to students in grades 1, 3, 5 and 7 in the Juneau School District. This effort enhances the knowledge and appreciation of CBJ residents toward bears and leads to a greater stewardship by residents that begins with proper refuse management.

Bears are enjoyed by the community as a natural resource, and in many cases are sources of pride for Juneau residents. Accordingly, trapping or destroying bears because they are accessing garbage is upsetting to many residents. With abundant bear habitat and numerous bears adjacent to urban areas, the community will see its fair share of bear activity. It is vital, therefore, that the steps taken thus far to limit access to garbage by bears be continued and built upon. The decrease in bear/human conflicts and associated phone calls and reports to the JPD and ADF&G is a testament to the success of the current strategies of managing refuse.

POLICY 7.15. TO PREVENT BEARS FROM GAINING ACCESS TO AND BECOMING CONDITIONED TO THE CONSUMPTION OF HUMAN-GENERATED FOOD AND GARBAGE BY PROVIDING PUBLIC EDUCATION, PROPER MANAGEMENT OF GARBAGE, AND PROTECTION OF THE NATURAL HABITAT AND FOOD SOURCES UPON WHICH BEARS DEPEND.

Standard Operating Procedures

- 7.15 - SOP1 Continue the current effort coordinated with JPD and CDD to monitor compliance with refuse container ordinances and maintain efficient and effective enforcement.
- 7.15 - SOP2 Provide public education and publicity to enlist the community's efforts to prevent bears from gaining access to garbage.

Development Guidelines

- 7.15 - DG1 Place Bear Food Conditioning Avoidance Best Management Practices on permits, as a condition of approval, for development located in or adjacent to bear habitat.
- 7.15 - DG2 Require construction of bear-proof garbage/refuse/recycling storage facilities in proper locations in all new multi-family residential developments and non-residential developments.

Implementing Action

- 7.15 - IA1 Study the feasibility of mandatory garbage pick-up in the roaded area of the borough, its costs, and its effectiveness in preventing stockpiled garbage.

Gravel Resources

Gravel resources, essential to construction, are limited to relatively small areas in the borough that are also frequently subject to development pressures. Growth and development in Juneau have increased local demand for sand, gravel and quarry rock. The most extensive deposits of sand and gravel are in the valleys of the Mendenhall, Herbert, and Eagle Rivers, as well as Lemon Creek. Primary sources of sand are the alluvial deposits within the Mendenhall Valley and areas adjacent to the Gastineau Channel. Rock suitable for quarrying is located throughout the CBJ area. The Natural Resource Inventory Sand, Gravel, and Quarry Rock (1978), the West Lemon Creek Material Resource Assessment (1985), and Eleven Potential Borrow Resource Sites Within and Adjacent to the City and Borough of Juneau (1988) are the primary sources of information regarding the location of these resources. Local builders state that the highest quality gravel material in the borough is on land owned by the CBJ government.

Development in areas where potential sand and gravel deposits are located can preclude extraction of these resources, both when they are built upon directly and when residential uses are developed nearby. As growth and development continue in the Mendenhall Valley and Lemon Creek areas, pressure for closing existing pits may grow, primarily because gravel extraction operations produce noise, dust, heavy truck traffic, run-off and other impacts that often conflict with surrounding land uses. As this resource is necessary for all types of development, and given the inherent conflict of this heavy industrial use to less intense neighboring uses, it is important to take steps to avoid or minimize land use conflicts.

POLICY 7.16. TO CONSERVE KNOWN GRAVEL DEPOSITS AND TO PROTECT THEM FROM CONFLICTING LAND USES.

Development Guidelines

- 7.16 - DG1 Where residential or other developments with sensitive receptors are permitted next to gravel deposits, require that a general note be placed on the affected subdivision plat and on property deeds and other appropriate title papers that advises prospective buyers of the proximity of the gravel resource, the potential noise, dust and truck traffic associated with its extraction and transport, and the expected number of years that the gravel extraction is expected to last. Sensitive receptors are all developments whose occupants can be harmed or annoyed by noise, dust, fumes and heavy truck traffic.
- 7.16 - DG2 Companies that transport gravel and rock products should be required to travel on roads with adequate heavy load-carrying capacity. Vehicles carrying rock and gravel are required to cover their loads so that the material remains in the vehicle and does not escape to break windshields or harm pedestrians or bicyclists.

Implementing Action

- 7.16 - IA1 Designate known gravel resource areas on the CBJ GIS and Land Use Code Maps.
- 7.16 - IA2 Amend the Land Use Code to require additional review of any permanent structures or other development proposed within untapped gravel resource areas that would preclude the eventual development of gravel resources: allow development if evaluation by a licensed civil engineer demonstrates that significant gravel resources do not exist on a particular site and if development does not interfere with extraction of gravel resources in nearby areas.

HAZARDS

All Hazards Mitigation Plan

The City and Borough of Juneau *All-Hazards Mitigation Plan* of 2009, as updated periodically and adopted by Resolution, investigates many more types of hazards than are identified in this Chapter. Risk assessment of each hazards type is provided, with a mitigation plan for each hazard threat. This plan is required to be updated every five years and is managed by the CBJ's Emergency Programs Manager. It is used to prioritize and support requests for funding of mitigation projects by the state and federal governments.

Landslide and Avalanche Hazards

Avalanches and landslides present a very serious threat to human safety and development in some areas of the borough, and their nature and severity have been documented in many, but not all, of the hazard areas. Careful evaluation of specific sites and corresponding land use and engineering solutions can help to minimize the risk of disaster.

Avalanches and landslides are discussed together because of their many similarities. Snow slides, or avalanches, are most likely to occur on moderately steep slopes, and although vegetation can help prevent avalanches from beginning as long as the vegetation is taller than the snow is deep, vegetation will not stop an avalanche from starting when the snow level is deeper than the vegetation is tall. Landslides or mudslides also typically start in moderately steep areas with little to no vegetation, or where previously-disturbed root systems cannot hold the underlying material (earth, rock, etc.) in place.

The debris and rubble at the base of steep rock slopes consists of soil and rocky materials that were deposited by slow erosional processes and/or sudden large-scale movements of dirt and rock, which may fall as earth/rock-only landslides or which may become entrained in avalanches. These debris slopes are indicative of historical landslides and/or avalanches. Studies of existing data and an analysis of aerial photographs indicate general locations and boundaries of landslide/avalanche areas.

The Land Use Code regulates development in landslide/avalanche areas and allows a developer to challenge the boundary of the avalanche and mass wasting area shown on the maps by submittal of a site-specific engineering analysis. If the Engineering Department is satisfied with the analysis, and the required criteria have been considered, the maps are revised.

The *Juneau Area Mass-Wasting & Snow Avalanche Hazard Analysis* was completed in 1992, but has not been adopted by the CBJ. It attempted to update portions of a study completed in 1972, the *Geophysical Hazards Investigation for the City and Borough of Juneau, Alaska and its Technical Supplement*, which provided initial mapping of these hazards. There are still areas needing more detailed study and other areas where landslide and avalanche potential has not been studied at all. The 2011 *Avalanche Mitigation Study: Behrends Avenue avalanche path and White Subdivision avalanche path, Juneau, Alaska*, conducted by WSL Institute for Snow and Avalanche Research SLF, reviewed the Mt. Juneau avalanche paths and made recommendations for mitigating danger in these paths. The 2011 Study also found that the hazard area boundaries in the 1972 Investigation were more accurate than those in the 1992 Analysis. The 2011 Study will be incorporated in the *All-Hazards Mitigation Plan*, which is adopted by Resolution. Documented or not, the threats are real and the consequences can be devastating.

POLICY 7.17. TO MINIMIZE THE THREAT TO HUMAN SAFETY AND DEVELOPMENT POSED BY LANDSLIDES (MASS WASTING) AND AVALANCHES.

Development Guidelines

- 7.17 - DG1 If a developer disagrees with the boundaries shown on the CBJ-adopted hazard maps, the developer may seek departmental relocation of the boundaries by submitting site-specific studies prepared by a licensed engineer, geologist, or recognized specialist in snow avalanche or mass-wasting behavior, energy, velocity, and destructive potential. Such studies shall include detailed analyses of topography, vegetation, soil and snow conditions, storm and climate analysis, and other factors relevant to the description of the snow avalanche or mass-wasting process. The study must describe how each of the factors was used in re-evaluating the snow avalanche or mass-wasting hazard. The results must indicate hazard boundaries and the physical characteristics of the process (extent, velocity, energy, flow height, impact and depositional loading, etc.).
- 7.17 - DG2 Review any proposed land disposals of CBJ-owned lands in light of their hazard classification; retain ownership of CBJ lands with moderate- to high- potential for avalanche or mass-wasting (landslide).
- 7.17 - DG3 Eliminate from long- and short-range development plans any public facilities that would have the effect of concentrating people in hazard areas; do not preclude roads through hazard areas.

- 7.17 - DG4 Tax-foreclosed property in the high hazard areas should be dedicated to the CBJ publicly-owned natural areas inventory.

Implementing Actions

- 7.17 - IA1 Designate areas of moderate and high landslide/avalanche hazards as being subject to such threats on the CBJ GIS database and maps as well as the Land Use Code Maps.
- 7.17 - IA2 Designate all public lands located in hazard areas as Hazard Areas (HA) on the Comprehensive Plan Maps. Include all CBJ-owned land in hazard areas in the Parks and Open Space/Natural Areas Plan.
- 7.17 - IA3 Complete the reassessment of hazard areas and include all areas of the original 1972 study, including the downtown Juneau waterfront area. Complete detailed mapping of the White Subdivision, Thunder Mountain and Thane Road hazard areas.
- 7.17 - IA4 Provide mitigating standards in the Land Use and/or Building Code for development in landslide and avalanche hazard areas based on the 1972 study. These standards may include dissipating structures or dams, appropriate structural and special engineering, or other techniques that respond to the specific hazards of the site. All development in the hazard areas must include mitigating measures that respond to the specific hazards of that site.
- 7.17 - IA5 The CBJ government should, to the greatest extent practical, acquire properties lying within areas designated as having high mass wasting or avalanche hazard potentials; these CBJ-owned lands should remain undeveloped.
- 7.17 - IA6 Amend the Land Use Code to prohibit industrial and resource extraction activities in high landslide or avalanche hazard areas unless it is determined that these activities will not increase the threat of landslides and avalanches on nearby lands.
- 7.17 - IA7 Amend the Land Use Code to require a hazard threat study for proposed development in areas outside of mapped hazard areas if the property shows potential for containing or being affected by such threats.

Earthquakes

The nearest known active seismic fault is the Fairweather, approximately 100 miles west of Juneau. Lynn Canal, Chatham Strait and the Gastineau Channel are classified as having major, though presently inactive, faults. Based on studies by the U.S. Army Corps of Engineers and United States Geological Survey, the CBJ Building Code places Juneau in a Seismic Design Category D1, in which major damage to structures from an earthquake equal to or greater than 6.0 on the Richter scale may occur (previously known as a Seismic Zone 3). There have not been any earthquakes of this magnitude within 125 miles (the range at which damage from such an earthquake might occur) of Juneau since record-keeping began (1847), but the Fairweather fault has seen earthquakes as powerful as 8.6 on the Richter scale, and in a two year-period (1899-1900) there were four earthquakes on this fault between 6.0 and 8.1 on the Richter scale. Since 1972, there have only been two earthquakes with epicenters within 125 miles of Juneau; both were measured as magnitude 4.5 quakes.

Flooding

Flooding occurs with relative frequency in the CBJ. It is a natural event that becomes a problem only when it threatens human health, safety, or development. Appropriate land use designations and development requirements can help minimize the potential of flood damage and threats to human health and safety. It is important to distinguish between the floodway, which is the main channel that is essential to the rapid drainage of floodwaters, and the floodplain, which is an area floodwaters may cover. Additionally, coastal flooding can occur as a result of high winds and high tides that create storm surges and wave run-ups.

Floods occur when climatic factors and development activities alter natural flow conditions in flood prone areas. Warm rainfall on a heavy snow pack or periods of heavy melting contribute to high stream flows and may result in flooding. The most serious flooding (that which threatens human safety and development) occurs when peak stream flows coincide with high tides, or in unique and highly unpredictable situations such as the outburst flood

of a glacier lake. Development, such as roads and buildings, creates impermeable surfaces that cause increased volumes and rates (velocity) of stormwater runoff. Stream crossings and under-sized culverts that are blocked by stream debris or ice restrict the passage of storm flows and can cause flooding.

Construction in floodways is dangerous to human life and property and further increases flooding potential and is, therefore, prohibited. In the 100-year floodplain, development should be prohibited unless measures that mitigate potential on-site and development-induced upstream and downstream hazards are undertaken.

The current floodplain requirements in the Land Use Code have been developed to comply with the Policy below and with the requirements of the Federal Emergency Management Agency (FEMA) so that local property owners can maintain eligibility under the National Flood Insurance Program. This insurance is available anywhere in the CBJ and is mandatory for any financing of property in Flood Hazard Areas if the loan has federal origins.

POLICY 7.18. TO PROHIBIT RESIDENTIAL, COMMERCIAL, AND INDUSTRIAL DEVELOPMENT IN FLOODWAYS, TO REGULATE DEVELOPMENT IN FLOODPLAINS, AND TO MAINTAIN A PROGRAM OF EDUCATION, ASSISTANCE, AND INFORMATION IN ORDER TO MAINTAIN ELIGIBILITY FOR THE NATIONAL FLOOD INSURANCE PROGRAM FOR THE BENEFIT OF LOCAL PROPERTY OWNERS AND THE LENDING INDUSTRY.

Standard Operating Procedure

- 7.18 - SOP1 Use the floodway and floodplain boundary lines outlined on maps prepared by FEMA as the basis for defining flood boundaries.

Development Guideline

- 7.18 - DG1 Apply the Flood Hazard Provisions of the Land Use Code to development proposals in the 100-year floodplain that increase flood danger, and prohibit commercial or industrial storage of toxic chemicals or materials in the 100-year floodplain.

Implementing Action

- 7.18 - IA1 Designate, on the CBJ GIS maps and Land Use Code Maps, areas within the 100-year floodplain but outside floodways as public open space/natural areas or stream corridor protection areas if the subject land is in public ownership.

POLICY 7.19. TO WORK TO PROTECT THE INTERESTS OF THE COMMUNITY BY TAKING AN ACTIVE ROLE IN DEVELOPING MAPPING AND POLICY CHANGES AT THE STATE AND FEDERAL LEVEL.

Standard Operating Procedures

- 7.19 – SOP1 Actively participate in review and comment opportunities for proposed changes to state or federal mapping or policy changes.
- 7.19 – SOP2 Be proactive in suggesting changes to state or federal maps and policies that will protect community interests.

