3.3 HABITAT RECOMMENDATIONS

A central purpose of watershed planning under Chapter 90.82 RCW is to provide for the protection and restoration of fish habitat while addressing water quantity and water quality issues.

3.3.1 Area-Wide Habitat Restoration, Salmon Recovery and Fish Management

Issue: Watershed management plans should incorporate, facilitate and support habitat restoration and salmon recovery underway through other State processes (see Chapter 1). This watershed plan explicitly aims to fulfill elements of a salmon recovery plan as envisioned under the Shared Strategy for Puget Sound ("shared strategy").

Existing Conditions and Current Actions

In WRIA 18, habitat losses, Endangered Species Act (ESA) listings, and the decline of other stocks (e.g., Dungeness River pinks) underscore the need for watershed planning to address habitat restoration and salmon recovery on a regional basis.

Endangered Species Act Listings and Other Stock Declines: ESA listings (Puget Sound Chinook salmon, Hood Canal/Eastern Strait of Juan de Fuca summer chum, and Puget Sound bull trout) are motivating a wide range of responses, including a multitude of fisheries management actions, the evaluation and potential setting of target stream flows, attention to improving freshwater quality, and numerous restoration projects being undertaken throughout WRIA 18.

The Salmon and Steelhead Stock Inventory (SASSI, 1992) provides important basic stock status information on all anadromous stocks, not just those listed under ESA. SASSI, and more recent stock analyses, describe these other stocks (of chum, coho, pink, and steelhead) as generally depressed or critical, with few exceptions (see Table 2.1-8). In response to the decline of virtually all anadromous stocks in the WRIA 18 study area, extensive planning, management, and restoration efforts have been conducted for many years.

Salmon Restoration Plans and Strategies: Currently, North Olympic Peninsula habitat restoration, salmon recovery, and fish management goals, objectives, and actions are guided by several comprehensive documents and planning processes. These are described in detail in Chapter 1. Prominent plans and processes (some of which have been updated since the publication date shown here) include:

(1) the WRIA 18 *Limiting Factors Analysis* (Haring, 1999);

(2) the *North Olympic Peninsula Lead Entity (NOPLE) Salmon Habitat Recovery Strategy* (2001), as a regional strategy and prioritization of habitat projects;

(3) the *Recommended Restoration Projects for the Dungeness River* (Dungeness River Restoration Work Group, 1997), sometimes called the "Blue Book," as a detailed and comprehensive restoration plan for the Dungeness River and a statement of the fundamental "pillars" of river restoration (updated proposed project list in Appendix 3-A);

(4) the *Elwha River Ecosystem Restoration EIS* (1995, et seq.);

(5) *Dungeness River Chinook Salmon Rebuilding Project Progress Report 1992-93* Northwest Fishery Resource Bulletin;

(6) *Dungeness River Chinook Salmon Rebuilding Project Progress Report 1993-98*, (WDFW Report #FPA00-24, 2001);

(7) the *Summer Chum Salmon Conservation Initiative* (WDFW and PNP Treaty Council, 2000), as a recovery plan for Hood Canal and Strait of Juan de Fuca summer chum;

(8) *Restoring the Dungeness: An Overview of the Dungeness River Restoration Strategy* (Jamestown S'Klallam Tribe, 2003), as documentation of the status of the Dungeness River watershed area and a description of the restoration strategy and recovery planning being actively pursued by the local community;

(9) the updated Dungeness Watershed Analysis (USFS) as a project list for federal forest lands; and

(10) additional habitat restoration plans, as summarized in the Appendices.

Together, these address the habitat needs of all WRIA 18 streams, develop an extensive range of restoration actions, and establish an overall strategy and priority structure to coordinate efforts and optimize results. They also form a basis for the necessary monitoring activities to properly design, implement, and evaluate these restoration actions.

Subbasin Plans: The primary documents described above are supplemented by more extensive and detailed stream-specific restoration plans for certain streams in WRIA 18. Notable examples for the Elwha-Morse area include those developed as part of the Elwha dam removal and ongoing restoration of Valley Creek. For the Dungeness planning area, examples include the 1997 DRRWG "Blue Book," the 1994 DQ Plan, and the current Comprehensive Irrigation District Management Plan process, as well as documents pertaining to the ongoing restoration of Jimmycomelately Creek.

All of these habitat efforts have translated into significant improvements to WRIA 18 habitat in numerous individual watersheds. Prime examples of these successful improvements can be found on Valley, Morse, Siebert, and Jimmycomelately creeks, and throughout the Lower Dungeness River. Sponsored by local governments, tribes, the Regional Fisheries Enhancement Group (RFEG) (North Olympic Salmon Coalition, NOSC), State and Federal agencies, citizen groups, and other non-profit organizations, these restoration projects have included a wide range of habitat restoration actions. These actions have included purchase of land from willing sellers, conservation easements, channel realignment, LWD placement, spawning gravel replenishment, riparian vegetation control and enhancement, flow restoration, fencing and other access control, blockage removal, and passage enhancements.

Harvest: As elsewhere in Washington, harvest in open salt waters in WRIA 18 is co-managed by the tribes, the WDFW, and the National Marine Fisheries Service (NMFS). This co-management addresses matters such as allocations, management of "terminal" vs. "mixed-stock" harvest strategies, regulation of seasons and gear, and similar aspects of harvest. In freshwater (within WRIA 18 watersheds), harvest is co-managed between the tribes and the Washington Dept. of Fish & Wildlife (WDFW). Management oversight is applied to allocations, seasons, gear, and other components of harvest. At the local level,

DRMT has occasionally submitted recommendations for harvest regulations for Dungeness stocks.

Hatcheries: Like harvest management, the complexities and challenges of hatchery management are closely linked to the outcomes of habitat restoration. Hatcheries entail construction of large facilities along stream channels and have substantial associated water rights. Consequently, hatcheries can have substantial physical impacts on the river channel and hydrologic impacts based on their water consumption. Also, fisheries science recognizes that hatchery programs have important, far-reaching effects on both the genetics and the survival rates of wild stocks. A statewide Hatchery Scientific Review Group (HSRG) reviewed all hatchery practices in light of the latest understanding of fisheries biology and hatchery impacts (Hatchery Scientific Review Group, 2002).

Hatcheries are present on the Dungeness and Elwha rivers. There are two hatcheries on the Dungeness, one at Hurd Creek, a small, east-bank tributary originating at RM 2.7 of the lower Dungeness, and the other at RM 10.5 on the mainstem of the river. These hatcheries currently support harvest supplementation programs for Dungeness Chinook, Coho, and steelhead stocks. The operation of these two hatcheries locally, which was reviewed in 2002 by the HSRG, is primarily a WDFW responsibility, with close involvement of the Jamestown S'Klallam Tribe.

On the Elwha River, WDFW operates a hatchery at RM 3.0 and the Lower Elwha Klallam Tribe operates its own hatchery at RM 1.0 on its reservation. These two hatcheries are fully incorporated into the larger Elwha River dam removal and river restoration project, and are managed consistent with the multi-agency fisheries restoration plan that is a principal part of the overall restoration. It is also possible that Morse Creek will be given a role in supporting that overall restoration effort.

Hydro: Hydropower facilities will soon represent a minor consideration in WRIA 18. With the impending removal of the two major dams on the Elwha River, the only remaining hydropower facility in WRIA 18 will be the City of Port Angeles facility on upper Morse Creek (RM 7.2), owned by the City of Port Angeles (see Morse Creek Section 2.4 for further detail).

Desired Conditions and Outcomes

- WRIA 18 stocks recovered to levels that can support healthy, sustainable fisheries.
- WRIA 18 salmonids listed under the ESA recovered to population levels sufficient to warrant delisting and subsequent recreational and commercial harvest.
- Well-integrated salmon recovery, habitat restoration and watershed planning processes, including chapters in salmon recovery plans for chinook, summer chum, and bull trout.
- A comprehensive funding program and strategy for regional habitat restoration and salmon recovery.
- Ongoing subbasin programs to inventory habitat, update the Limiting Factors Analysis, and identify and prioritize habitat protection and restoration projects.

- Long-term fish and habitat management, for healthy fish stocks and watershed processes, based on continuing monitoring and adaptive adjustments.
- Maintenance, protection, restoration, and enhancement of native and wild fish stocks including listed (ESA), critical, high potential of becoming critical, depressed and healthy stocks of salmonids in the river.[1]

Recommendations

A. Fisheries Habitat Management:

1. The DRMT, the West WRIA 18 Watershed Council and local technical advisory groups should be involved in implementation of an approach to the management of native and wild stocks, fish habitat, and hatcheries that reflects the need to protect and rebuild stocks while instream flow and habitat improvement projects are implemented.[2]
2. In all management actions, strive to retain (maintain) or restore structural and functional characteristics of river, riparian and wetland habitats which are important to fish and wildlife.[3]
3. Identify rivers, riparian corridors and wetlands according to their importance as habitat, and for wildlife and fish values, hydrologic recharge and storage (flood control), and aesthetic and recreational values.[4] See Table 3.4-3 for priority categories for West WRIA 18 streams and rivers.
4. Protect and maintain or enhance, and in some cases, restore those areas with high values and functions.[5]
5. Identify, study, and seek to restore degraded river, riparian and wetland habitat conditions caused by both natural and human impacts.[6]
6. Develop a management plan to increase the values and functions of the habitat and to make better use of the existing water resources.[7]
7. Education for riverside landowners and river users should be considered as a vital component of the habitat management planning effort.[8]

B. Harvest

1. Manage harvest levels: determine impacts of terminal vs. mixed-stock fishing, and analyze "high tech" fishing techniques on native stocks; regulate annual

[1] DQ Rec. R.11
[2] DQ Rec. R.11.2 & R.11.2.2(a), modified
[3] DQ Rec. R.8, modified
[4] DQ Rec. R.8.1
[5] DQ Rec. R.8.3, modified
[6] DQ Rec. R.8.6
[7] DQ Rec. R.8.7
[8] DQ Rec. C.7.1.14

and in-season catches to provide protection, restoration and enhancement of critical and depressed stocks.[9]

C. Hatcheries:

1. Implement HSRG recommendations related to protection of wild salmon runs, continuation of hatchery-based fish restoration and incubation programs, and minimization of competition between hatchery and wild fish.
2. Protect wild fish and provide good conditions for hatchery fish while avoiding competition between the two.
3. Open the anadromous fish passage presently blocked by the diversion to the hatchery at Canyon Creek. Consider moving some hatchery facilities out of the floodplain and restore the floodplain on the Dungeness Hatchery grounds.
4. Continue the restoration and recovery programs in Jimmycomelately Creek and the Dungeness River. Secure ongoing funding necessary for facilities such as Hurd Creek hatchery and for personnel to implement these programs until they sunset.

D. Monitoring:

1. Prepare an annual report on WRIA 18 habitat restoration and salmon recovery. Maintain integrated and updated documentation of actions taken under all regional and subbasin habitat restoration and salmon recovery plans and programs. Integrate information on stock status, fisheries management, and hatchery management at the watershed level.
2. Use GIS to track monitoring locations.
3. Adopt, at minimum, the required elements of the State-level Watershed Health monitoring program.
4. Explore funding sources for ongoing monitoring, including local government, and State or Federal sources. Include funding for monitoring in river and habitat studies.
5. Conduct regular reconnaissance of all appropriate WRIA 18 rivers and streams by a qualified stream geomorphologist to identify emerging problems and changes affecting restoration and rehabilitation actions.

E. Enforcement:

1. Seek additional funding to increase enforcement of fish and wildlife regulations with emphasis on critical and threatened species.
2. Support increased enforcement and monitoring of salt-water fisheries, interception, and take.

[9] DQ Rec. R.11.2.1

3.3.2 Rural Streams

Issue: Small streams, especially those in rural areas, are recognized for their importance as habitat for anadromous fish and other wildlife and as an important stimulus for stock diversity. These streams are particularly vulnerable to impacts related to changes in groundwater recharge, development, stormwater runoff, water diversion, and loss of ground cover (i.e., clear-cutting).

Existing Conditions and Current Actions

Habitat values associated with rural streams throughout WRIA 18 have received increasing attention over the past decade in the various planning efforts and land use management actions of local governments. Several steps have been taken to begin identifying and prioritizing projects to protect or restore habitat in rivers and small streams (in both rural and urban areas). Among these are the 1997 inventory by WDFW, the Limiting Factors Analysis for WRIA 18 (Washington Conservation Commission 1999), and the development of a comprehensive habitat restoration project strategy by the North Olympic Peninsula Lead Entity Group (2001) that includes identification of restoration priorities for each WRIA 18 stream and a four-tier framework that prioritizes the streams relative to each other based on their habitat and stock restoration potential, as well as other factors.

Additional local and watershed efforts have been undertaken in various subbasins within WRIA 18. Local efforts include stream-specific assessments conducted by the Clallam Conservation District (CCD) and Streamkeepers, and the “Blue Book” developed by the Dungeness River Restoration Work Group (1997) for the Dungeness River Management Team (DRMT). DRMT also has developed a list of protection and restoration accomplishments since the completion of the DQ plan in 1994 (Appendix 1-E).

Local governments have established regulatory and land use management frameworks to guide human use of these rural and urban stream corridors. Clallam County has adopted a Critical Areas Ordinance (CCC 27.12.315) for identifying and protecting key parts of stream corridors. The City of Sequim provides critical area protection through its comprehensive plan and zoning code (Title 18). The City of Port Angeles addresses critical area protection through both its comprehensive plan and its “Environmentally Sensitive Areas” ordinance. Further planning efforts to address habitat needs continue as opportunities arise.

There is also an extensive array of monitoring and evaluation activities conducted by various local entities. These activities are not comprehensive and not fully coordinated, but they do help identify and develop restoration needs, design habitat restoration actions, and evaluate the effectiveness of those actions. Streamkeepers, a county-sponsored network of volunteers conducts regular (usually quarterly) monitoring on eight WRIA 18 rural streams and also supports special monitoring activities on some additional streams. The Lower Elwha Klallam and Jamestown S’Klallam tribes conduct ongoing and project-specific monitoring on rivers and streams of special importance to them (e.g., the Dungeness and Elwha rivers, Jimmycomelately, and Matriotti creeks). Ecology and the County have installed eight real-time gages in East WRIA 18 and a number of staff gages to monitor stream flows.

These monitoring and evaluation activities have led to an array of habitat restoration projects that is substantial and widespread throughout WRIA 18. Significant habitat restoration has already been achieved or is underway on the Dungeness River and Jimmycomelately Creek. These habitat projects have been conducted by a diverse array of individual governments, Federal/State/local agencies, volunteer organizations, individuals, and various partnerships among them. In addition, local watershed groups have begun to form on the Elwha and Dungeness rivers, and Siebert and Jimmycomelately creeks. Restoration and protection projects address a wide range of habitat needs; they include land purchase from willing sellers, conservation easements, LWD placement, spawning gravel replenishment, riparian vegetation control and enhancement, fencing and other access control, blockage removal, and passage enhancements. Many of these projects are being monitored and evaluated for their effectiveness and these evaluations are leading to adaptive adjustments in stream and river habitat management.

Desired Conditions and Outcomes

- Small stream habitat protection and restoration activities are fully coordinated with and through the ongoing 2496 process and other funding sources.
- Stream-based habitat values are protected.
- A comprehensive program of habitat needs identification, restoration actions, protection and management addresses rural streams and supports the continuing refinement of the NOPLE strategy.
- Sufficient and regular stream monitoring is implemented and maintained for all WRIA 18 streams.
- Implementation of small stream habitat protection and restoration on a watershed-by-watershed basis is supported by and through local watershed groups (see recommendation 3.8.2), using the NOPLE strategy as guidance.

Recommendations

A. Critical Areas Ordinance: Recognizing that the Courts have ruled that Clallam County's current version of the CAO meets the requirements of the Growth Management Act, updates of the CAO prepared in conjunction with future Comprehensive Plan development regulation updates required by GMA should consider analyzing and upgrading the Clallam County Critical Areas Ordinance, as needed, to recognize adequate channel migration zones (CMZ) and riparian buffers. Redefine riparian buffers, include associated wetlands, to begin at the edge of the channel migration zone for both small and large streams. Consider including language that ties implementation of the CAO to a watershed-based data set that could limit the use of buffer averaging, variances, and reasonable use exceptions (deviations from the standards) in areas already impacted.

B. Irrigation and Surface Water Diversion Management:

1. On non-WUA diversions, conduct field checks to assure that effective fish screens or barricades are in place at diversions.

2. Eliminate all illegal diversions.

C. Habitat Restoration:

1. Continue to update information pertaining to factors limiting salmon productivity as identified in the Limiting Factors Analysis for WRIA 18 small streams.
2. Initiate restoration where sufficient fish population and habitat information, including limiting factors and habitat-forming processes, is known. Where additional information is needed, update characterization of small streams based on individual knowledge, field experience, file data, and other sources.
3. Based on the LFA and historical information, restore small streams using applicable local, state and federal guidelines, e.g.:
    a. Priority Habitat Species (PHS)
    b. WDFW Stream Restoration Guidelines
    c. Conservation Reserve Enhancement Program
    d. NOPLEG Habitat Restoration Strategy
4. Focus restoration work on nearshore connections at mouths—e.g., Gierin, Bell, Cassalery, and Cooper creeks.
5. The rehabilitation of small streams should be pursued even without supplementing flows because productivity may still be maintained with low water levels. Rehabilitated reaches of streams may act as "shock absorbers" to protect downstream areas, e.g. by storing sediment, providing flood hazard reduction, and protecting downstream areas from runoff.[10]

D. Research and Monitoring:

1. Carry out a program of smolt trapping and determine fish numbers by stock in WRIA 18 streams.
2. Regular monitoring should be carried out in WRIA 18 small streams. Monitoring should include (but not limited to):
    a. Flows (including recording irrigation changes)
    b. Pollutant loadings of concern, temperature, turbidity
    c. Habitat indicators such as LWD, pool-riffle ratio, and vegetated cover
    d. Water use related to permitted use, insofar as is practicable
3. Continue support for Streamkeepers and expand Streamkeepers monitoring to assist in carrying out the above program.

[10] DQ Rec. C.10.4.1

3.3.3 Urban Streams

Issue: Urban streams are often overlooked, even though they have potential and importance, for education and outreach and as habitat, for anadromous fish and other wildlife.

Existing Conditions and Current Actions *(see also the discussion in 3.3.2, Rural Streams)*

Urban and urbanizing streams have generally been far more significantly altered from their natural condition than rural streams. The types of alterations and impacts are also far different, and impediments to meaningful restoration are usually much greater than for rural streams. Even so, urban streams have varying degrees of restoration potential. They can contribute to overall improvement of the regional habitat conditions for fish and wildlife. They also are more visible and accessible to the public and therefore can offer significant educational opportunities.

In other ways, urban streams share many of the same challenges with the rural streams of WRIA 18. The habitat values associated with the urban streams in WRIA 18 (Dry, Tumwater, Valley, Peabody, White, Ennis, Lees, and Morse creeks in the Port Angeles area, and Bell Creek in the Sequim area) have received increasing attention in planning efforts and land use management. Local urban watershed groups have formed for Tumwater, Valley, and Ennis creeks. Urban streams have been included in programs to monitor stream conditions (quality and quantity) and to identify and prioritize habitat-related projects to protect and restore habitat (see discussion above).

Notable efforts targeting urban streams include habitat restoration on Dry, Valley, Ennis, Morse, and Bell creeks. One notable example is restoration work being done in Valley Creek, a small stream that has been heavily impacted by urbanization and where restoration goals are as much recreational and educational as they are ecological. In urban areas, these habitat-oriented actions are often more difficult and costly to achieve. They usually cannot demonstrate as strong a “cost-benefit ratio” as actions on rural streams do. These constraints are reflected in the existing frameworks guiding restoration efforts, such as the NOPLEG strategy, which currently characterizes most urban streams as Tier 4 (Valley and Ennis are rated as Tier 3). However, in spite of these limitations, important improvements have been accomplished and there is substantial interest in building on those successes.

Desired Conditions and Outcomes

Urban streams included as part of the overall effort to comprehensively address habitat needs.

- A comprehensive program of habitat needs identification, restoration actions, protection and management that addresses all urban streams along with the rural streams.
- Restored and protected urban streams that provide salmon restoration benefits, public education value, and/or achieve other community watershed-related goals.
- Flows from other streams do not degrade other streams or marine waters to which they are tributary.

Recommendations *(in addition to all applicable recommendations listed for rural streams)*

A. Urban Stream Rehabilitation: DRMT and the recommended West WRIA 18 Watershed Council should seek funding for and develop an ongoing program of urban stream rehabilitation. The program should be coordinated with City and County stormwater management, Growth Management, Critical Areas, and with the recommendations of this Watershed Plan. The urban stream rehabilitation program should:

1. Recognize and preserve high-quality, low-development watershed areas through zoning, education, conservation easements, and other tools.
2. Systematically and comprehensively evaluate stream conditions for all the Port Angeles and Sequim urban drainages.
3. As warranted, based on the outcomes of watershed evaluations and plan priorities, aggressively rehabilitate streams where recovery of ecosystem elements and processes is possible and where elimination of sources of degradation is cost-effective and feasible.
4. Rehabilitate selected areas of urban watersheds where complete recovery is not feasible but where well-selected efforts may yield direct improvement, particularly on public lands.
5. Improve the most degraded streams by first analyzing the acute causes of degradation, recognizing that the potential for full biological restoration is of more limited and of lower priority. Emphasize that the first, and often the most important, step is to cease further degradation by fully addressing stormwater run-off, sedimentation, unauthorized dumping, etc.
6. Search for upstream restoration opportunities that may benefit downstream areas.
7. In the most highly developed areas, emphasize community outreach and education.
8. Look for opportunities to achieve restoration work on nearshore connections at mouths—e.g., Morse, Ennis, Valley, Tumwater and Dry creeks
9. Pursue a long-term goal of restoring the full range of natural hydrologic function to the extent feasible, recognizing that the hydrologic consequences of urbanization may not be easily reversed.
10. Protect localized patches of healthy riparian corridor where they occur, for their contribution to biological integrity. Recognize that their value will vary with basin-wide urbanization. Where overall basin development is low to moderate, maintain natural riparian corridors. In highly urban watersheds combine targeted restoration projects with treatment of other factors limiting biological integrity.
11. Develop approaches to minimize the impacts of human actions on streams such as those arising from homeowner lawn management and property improvements.

3.3.4 Wetlands

Issue: Wetlands are a vital component of healthy watersheds, providing a wide array of important habitat and other benefits to the natural and human environment. Examples include water purification, stormwater storage, wildlife habitat and migration corridors, and aesthetic quality. The Olympic Peninsula has great wetland diversity and the rain shadow of the Olympic range creates unique ecological communities in WRIA 18.

Existing Conditions and Current Actions

A substantial portion of WRIA 18's historic wetlands has been lost through diking, draining, fill, and development. Much of this loss may be irretrievable. Wetland protections are afforded at the federal level through USFS forest practices, ACOE Section 404 wetland permits, and, at the State level, by Department of Ecology wetland water quality certification and by provisions of the Shorelines Management Act, the Forest Practices Act, and the Hydraulic Permit Application process. Local governments have established regulatory and land use management frameworks to guide human use of wetlands (e.g., Critical Areas or Environmentally Sensitive ordinances; see Chapter 1) and WRIA 18 wetlands have received some attention in planning efforts and land use management and protection. Wetlands have been included in programs to identify and prioritize habitat-related projects to protect and/or restore habitat (see discussion of these efforts under small rural streams).

Wetland inventories have been conducted by Clallam County (Strategic Wetland Information System, SWIS 1995), the City of Port Angeles, and the City of Sequim. Restoration, protection, and monitoring efforts are constrained by funding and workloads of resource professionals. There has been some limited local success at protecting, enhancing, restoring, and constructing wetlands in WRIA 18.

Irrigation in East WRIA 18 has artificially maintained some wetlands. The relationship between irrigation and wetlands is evaluated in a groundwater model and an EIS on the Water Users Association Comprehensive Water Conservation Plan and published by the Department of Ecology.

Desired Conditions and Outcomes

- Overall net gain in productive and functioning wetlands.
- A local action program to enhance existing wetlands.
- Inventory of high priority, high value wetlands.
- Identification of wetland restoration and protection opportunities and priorities.
- Regular monitoring and assessment of wetland extent and conditions.
- Wetlands management incorporated into broader habitat programs, including salmon recovery, flood hazard, and stormwater planning.
- Existing natural wetlands protected within all permitting processes.

Recommendations

A. Wetlands Management:

1. Follow the federally-defined *Mitigation Hierarchy,* to protect wetlands and other aquatic habitat. Impacts should be approached in this order: 1) avoid impacts, 2) minimize impacts, 3) rectify negative impacts, and 4) compensate for impacts.[11]
2. Wetlands should be recognized according to their importance for habitat, wildlife species diversity, hydrologic recharge and storage (flood hazard mitigation), and aesthetic and recreational human values.[12]
3. Maintain and periodically update detailed mapping of existing, potential, and, to the extent feasible, historic wetlands.

B. Critical Areas Ordinance: In conjunction with future Comprehensive Plan development regulation updates that are required, CAO updates should consider redefining riparian-associated wetlands to begin at the edge of the channel migration zone for both small and large streams. Consider including language that ties implementation of the CAO to a watershed-based data set that could limit deviations from wetland protection and enhancement standards.

3.3.5 Riparian Corridors

Issue: Riparian corridors are an inseparable element of river ecosystems, and their health is vital to properly functioning conditions in these environments. Riparian zones provide a wide array of important habitat features and other benefits to the natural and human environment.

Existing Conditions and Current Actions

As broad attention increasingly has been given to water resource and habitat issues, the importance of riparian corridors has become better understood and they have been, to some extent, incorporated into the various planning efforts and land use management actions of local governments. Riparian habitat is considered in the inventories and strategies for small streams and is included within the local regulatory frameworks, monitoring and evaluation activities, and habitat protection and restoration projects. Key efforts include a riparian land protection program focused on the Lower Dungeness River, restoration planned and underway on Jimmycomelately Creek, and efforts by local watershed groups on the Elwha River, and Tumwater, Valley, Ennis, Matriotti, Siebert, and Bell creeks.

Desired Conditions and Outcomes

- Riparian zones are considered and included in habitat restoration activities associated with WRIA 18 streams wherever required for properly functioning conditions.
- High priority, high-value riparian lands are identified and prioritized for protection.

[11] DQ Rec. R.8.4

[12] DQ Rec. C.10.1

- A local action program retains and enhances existing riparian habitat.
- WRIA 18 riparian lands are regularly monitored and assessed.
- Riparian management considerations are incorporated into broader habitat programs, including salmon recovery, flood hazard, and stormwater planning.

Recommendations: *(in addition to all applicable recommendations listed for rural streams)*

A. Land Protection:

1. Fund and undertake a program of purchasing priority riparian parcels from willing sellers on WRIA 18 rivers and streams. Such a program can be coordinated with the CREP and FREP programs. Build on the DRRWG riparian parcel prioritization (in *Recommended Land Protection Strategies for the Dungeness Riparian Area* (2003)) for the Dungeness River and on other processes that identify key property needs.
2. Seek grant funding to help landowners establish conservation easement agreements and to build the endowment funding needed to uphold agreements for perpetuity.

B. Riparian Management and Buffers:

1. Riparian management goals and activities should be explicitly considered and, wherever possible, integrated with all related planning processes and habitat restoration projects such as flood hazard management, stormwater planning, and salmon recovery projects.
2. Maintain and periodically update detailed mapping of existing, potential, and, to the extent feasible, historic riparian zones.
3. Regularly monitor the extent and ecological condition of existing and potential riparian areas.
4. Protect riparian buffers, including marine riparian buffers.
5. Consider existing water quality and the potential to affect water quality whenever determining stream riparian buffers for land development.

C. Riparian Restoration:

1. Continue riparian restoration and fencing to stabilize stream banks and marine riparian areas and to reduce the movement of pollutants.
2. Use native plants in restoring WRIA 18 riparian zones.

D. Livestock Access: Where livestock access is not addressed under the Critical Areas Ordinance (i.e., for areas not designated “critical”), identify and locate problem areas, define BMPs, and consider designation under CAO.

3.3.6 Wildlife Management

Issue: In addition to healthy fisheries, healthy wildlife populations are an integral part of fully functioning watershed ecosystems. Managing watersheds to support terrestrial wildlife is an important complement to achieving upland, wetland, and riparian habitat protection that supports fisheries restoration and broader water resources protection.

Existing Conditions and Current Actions

Protection and potential improvements to wildlife and wildlife habitat are mostly addressed on federal and state levels. Olympic National Park and Olympic National Forest lands implement wildlife management programs under their various mandates. State lands, managed by WDNR, WDFW and Washington State Parks, similarly implement plans and projects to protect wildlife and wildlife habitat.

At the local level, critical areas/environmentally sensitive areas ordinances (as described under small rural streams above) as well as elements of comprehensive plans address habitat of high value to wildlife. Tribes, agencies (such as the Conservation District and Natural Resources Conservation Service), and ad hoc groups (e.g., Elk Committee) include or emphasize protection of wildlife and wildlife habitat. These local efforts have expanded to include technical assistance, educational activities, restoration project management, land acquisition and easement programs, and other landowner incentive programs that support these wildlife-related goals.

Efforts have begun to identify functional habitat and greenspace corridors in some watersheds. In particular, stream and fisheries-oriented restoration projects are increasingly incorporating elements supportive of wildlife and wildlife habitat in their overall design and implementation. This is particularly true of activities taking place on the Elwha and Dungeness rivers and on Ennis, Siebert, Bell, and Jimmycomelately creeks.

Desired Conditions and Outcomes

- Wildlife is recognized as an important component of the bioregional ecosystem and should receive protection on local, State, and Federal levels.[13]
- Wildlife and wildlife habitat protection and enhancement are included as integral components of watershed (and related land use) planning and management, permit writing, and in the design and implementation of fisheries-oriented restoration activities.

Recommendations

A. Inventories and Assessments: Include wildlife inventories and wildlife habitat assessments on a subbasin basis within other natural resources planning, management and restoration activities to the extent feasible.

B. Establish and Maintain: Support efforts to establish wildlife habitat areas and to maintain intact greenspace corridors which will allow protection of water-related

[13] DQ Recs. R.12 & C.9

habitats and ecosystems.[14]

C. NOPLEG Strategy: Consider expanding the NOPLEG Strategy to incorporate appropriate wildlife considerations and to encourage individual project proposals to address potentially complementary improvements to wildlife habitat.

D. Wildlife Habitat and Salmon Recovery: To the extent that it can be done consistently in support of salmon recovery, set an overall goal to achieve adequate wildlife habitat throughout each subbasin sufficient to support viable, healthy populations of key wildlife species native to each watershed.

E. Determine, Establish, and Maintain: Wherever possible, determine, establish, and maintain corridors for wildlife that travel through watersheds. Where corridors are not yet or not at all possible, determine, establish, and maintain habitat "islands" sufficient to provide overall habitat complexity and to maintain biodiversity.

F. Wildlife Protection: Encourage and support the Washington Department of Fish and Wildlife in its mandate to provide ample protection for wildlife in the State.[15]

G. Private Property and Preservation: Support the *Public Benefit Rating System* and market it to maximize opportunities for private property owners to preserve habitat corridors and greenspaces.[16]

H. Greenspace Corridors: Support efforts to establish wildlife habitat areas and maintain intact greenspace corridors that will allow protection of habitats and ecosystems.[17]

I. Clallam County's Greenspace Program: Support Clallam County's Greenspace Program and work to provide funding to protect a greenspace corridor along the Dungeness River.[18]

J. Landowner Incentives: Local governments should encourage landowners with incentives to provide private property for habitat corridors through planning efforts, tax breaks or other programs.[19]

3.3.7 Floodplains and Flood Hazard Management

Issue: Floods, flood hazard management, and the floodplains over which flood waters extend profoundly influence river processes, habitat conditions for fish and wildlife, and human health and safety. Full consideration of flood hazard management planning and

[14] DQ Rec. R.12.2
[15] DQ Rec. R.12.1
[16] DQ Rec. R.12.3
[17] DQ Rec. C.9.2
[18] DQ Rec. C.9.2.1
[19] DQ Rec. C.9.2.2

the hydrologic and fluvial geomorphologic functions and values of flooding should be incorporated in watershed and land use planning.

Existing Conditions and Current Actions

This section addresses subbasins (or portions of subbasins) in which streams retain at least remnant portions of intact floodplains and in which floodwaters are developed from predominantly natural watershed lands. In WRIA 18 subbasins (or portions of subbasins) where historic floodplains have been significantly altered by urban development and where floodwaters are managed within largely urbanized watersheds, issues and recommendations are considered in this watershed plan under the topic of stormwater management.

The Dungeness River is subject to occasional major Pacific storms and vulnerable to rapid onset of flooding. The river channel has experienced downcutting and aggradation, lateral instabilities and side-channel changes, in the river channel; and slope failures and mass wasting in the upper river on National Forest land. The largest of 10 major flood events of record considered in the 1990 plan is now considered a 25-year flood event, but a new flood of record (7,610 cfs) occurred in January 2002. A USGS gage record peak discharge (circa 1900-01) has more recently been identified to be as high as 7540 cfs.

Although the County flood plan is currently being updated for the Dungeness, Clallam County is operating under the 1990 Dungeness River Comprehensive Flood Control Management Plan. That plan concentrated primarily on protecting life and property from flood hazard in the 100-year floodplain as defined in a 1989 FEMA (Federal Emergency Management Agency) Flood Insurance Study. Since 1927, eleven major constrictions have been constructed from the hatchery downstream. Substantial changes in the river corridor since 1990 include: replacement bridges at Highway 101 and Old Olympic Highway; extension of the Dungeness Meadows dike; reconstruction of a portion of the Haller dike; bank stabilization and channel protection downstream of Railroad Bridge and upstream of Schoolhouse Bridge; and large woody debris modifications.

Over the past decade intensive efforts have been made in river restoration, salmonid recovery, and watershed planning, and extensive research has added to the knowledge of Dungeness River processes and conditions. Considering the significance of changes and new information accumulated over the past 12 years, DRMT, Clallam County and Ecology have recognized the need to modify and broaden the Flood Plan addressing longstanding concerns for protecting life and property while incorporating river restoration and salmon recovery. A Flood Plan Committee has been convened. An amended flood plan is currently in preparation. Countywide, including the remainder of WRIA 18, the 1995 Clallam County Flood Hazard Management Plan provides guidance, but does not incorporate habitat-related considerations.

In East WRIA 18, flood management projects have been continually pursued as resources have allowed. In 1999, Chadd reviewed and documented projects that were either being planned at that time or that were completed in the prior 5-year period (1994 through 1999):

- A County Critical Areas Ordinance, passed in December 1999, was created to provide buffers for these areas. Floodplain restoration projects were ongoing as possible.
- A 1997 project downstream of the old Duncan Bridge (May Road crossing on the Robinson property) pulled back the bank by 450 feet and reduced a major constriction on the river.
- A 1997 project at Fish Hatchery Road stabilized the bank with bioengineering.
- A 1997 project pulled back and reconstructed the Haller Dike (with NRCS).
- A study of dikes on the Dungeness River was initiated by the Corps of Engineers in 1997.
- A 2000 technical report by the Bureau of Reclamation compared 1930's and 2000 conditions and analyzed alternatives for levee modifications along the Dungeness River in the Lower 2.7 River Miles.
- The Burlingame Bridge was replaced in the mid-1990's, expanding the bridge span by 290 feet and removing a constriction including over 12,000 cubic yards of fill that had been placed along with the old bridge in 1935.
- A 2000 engineering study was prepared for the County by the Bureau of Reclamation to evaluate river hydraulic and sediment transport aspects of extending or lengthening the Schoolhouse Bridge.
- A dike pullback was scheduled for Kinkade Island in 2000. This is the narrowest constriction in the upper Dungeness. (Project completed in 2000, results being monitored by Streamkeepers; a geomorphic assessment of Kinkade Island was prepared for Clallam County by Bureau of Reclamation in 2003.)
- The County hired a Salmon Resources Planner (Nov. 1999) to coordinate updating the County's Flood Control Management Plan. (Draft Dungeness River Comprehensive Flood Hazard Management Plan completed in 2003; *Recommended Land Protection Strategies for the Dungeness Riparian Area* was developed by the RRWG in 2003, and will be integrated into the final Comprehensive Flood Hazard Management Plan.)

In 2001 a joint effort by North Olympic Land Trust and the Interagency Committee on Outdoor Recreation (IAC) was completed, resulting in the protection of 103 acres (in eight separate parcels) of riparian and floodplain habitat. One 40-acre parcel is now protected floodplain/riparian habitat that will enable the relocation of a dike to increase the associated floodplain just upstream of the Schoolhouse Bridge. The county has initiated a comprehensive land acquisition program for the "River's End" properties at the mouth of the Dungeness in order to achieve flood hazard reduction, floodplain protection and restoration, and riparian habitat improvement. The program is now completing its first purchases.

Flood-related concerns on the Elwha River have been extensively evaluated in the context of dam removal and river restoration. Because of the substantial changes to river morphology and hydrology that will follow dam removal, thorough attention is being given to the habitat aspects of floods and floodplains within the overall restoration process.

Regulatory protection and management of non-federal floodplains and their habitat value is provided under the County's Critical Areas Ordinance. As called for in the Growth Management Act, Sequim addresses these concerns within critical areas management through its zoning ordinance (Title 18.80, Environmentally Sensitive Areas Protection, which includes development standards) Port Angeles also has critical areas ordinances and has prepared a Stormwater Management Plan (1996).

Accurate flood maps for each watershed are among the most important tools in flood hazard and floodplain management. However, FEMA flood maps for much of WRIA 18 are out of date. For example, the FEMA maps for the Dungeness are based on actuarial information in addition to historical physical features. Consequently, they do not accurately reflect current or changing river conditions, nor do they present a correspondingly accurate portrait of flood risks. FEMA has received funding to update these maps under a "map modernization project," to which localities can provide new data in order to improve the new maps.

Desired Conditions and Outcomes

- Comprehensive flood hazard management plans for major WRIA 18 subbasins (Elwha, Morse, and Dungeness) that fully incorporate river processes and habitat considerations.
- Accurate and updated flood maps for major WRIA 18 subbasins.
- WRIA 18 streams and rivers reconnected to their floodplains and estuaries to the extent feasible, consistent with the protection of human health, safety, property and salmon recovery.
- Voluntary landowner participation in efforts to protect riparian floodplain.

Recommendations

A. Flood Hazard Management Planning and Floodplain Restoration:

1. Protect, and in some cases restore, floodplain and estuarine habitat to provide functions and values necessary to provide for the protection of life, safety, and property and to protect fish and other wildlife resources, to reestablish naturally functioning stream geomorphology, reconnect river and streams to their floodplains and tidal estuaries, restore natural river and floodplain processes, and maintain river channels and banks in dynamic equilibrium. A gradual evolution away from floodplain development and occupation and impacts on the ecosystem should be the goal.[20] Reconnect estuarine wetlands to their adjacent streams wherever possible.
2. Clallam County should develop and implement a new integrated flood planning and habitat restoration/protection plan, linking previous plans, Comprehensive Plan, 2514 Watershed, Blue Book, Land Protection Strategy, and Clean Water District planning.
3. Reevaluate flood planning in light of changes to streams and habitat conditions after major floods occur.

[20] DQ Rec. R.9

4. For urbanized and urbanizing WRIA 18 subbasins, determine existing effective impervious cover and establish goals that balance existing development, planned growth, and stormwater management. Incorporate low impact development techniques. Strive to limit total effective impervious cover in each WRIA 18 subbasin to less than 7%. (See also Section 3.5)
5. Prohibit future development in the Dungeness River floodplain. (Refer to the County's Floodplain Ordinance regarding these regulations.) Review, update and strengthen Clallam County Floodplain Ordinances to make sure they are adequate to protect natural floodplain functions.[21]
6. Implement the Dungeness River Comprehensive Flood Hazard Management Plan, as updated; continue implementation of the Dungeness River Area Watershed Management Plan; and integrate them with revisions to the County Comprehensive Plan, applicable County ordinances, and salmon recovery planning.

B. Floodplain Delineation:

1. Delineate the floodplains of small WRIA 18 streams.
2. Redraw FEMA delineations based on LIDAR mapping and BOR studies, to reflect actual fluvial geomorphology.
3. Update Critical Areas maps based on LIDAR and other aerial mapping sources.

[21] DQ Rec. R.9.1

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