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STREAM CORRIDOR MANAGEMENT PLAN

FOR THE LOWER TRASK, WILSON, KILCHIS, MIAMI AND NESTUCCA RIVERS

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FORWARD

(To be developed)

BACKGROUND

The 1992 Mediated Agreement

In November 1991 the Oregon Department of Fish and Wildlife requested that the Division of State Lands, "because of the critical status of Tillamook Bay chum salmon and the importance of gravel to their life-history... deny new permits or requests for renewal of existing permits for commercial gravel removal operations on the Nestucca, Trask, Wilson, Kilchis, and Miami rivers until it is demonstrated that the activity poses no negative impacts to chum salmon."

At that time, 58,000 cubic yards of gravel were being removed annually from local rivers under

commercial permits issued by the Oregon Division of State Lands (DSL). Tillamook County had not yet identified adequate local upland sources of aggregate to meet current or future needs. Most of the local supply of high quality material for production of asphalt and concrete was obtained from riverbeds. In addition, the protection of productive agricultural soils from stream bank erosion was a concern of landowners and bar skimming was used to control erosion.

Although the various parties with an interest in this issue agreed that it was important to stabilize chum salmon runs, they did not agree on the extent to which removal of gravel was detrimental to chum salmon habitat. In an attempt to resolve this issue, the parties entered into mediation. The Division of State Lands, in consideration of the mediation process, renewed commercial gravel permits on the rivers of the Tillamook system for the 1992 removal season. Although the issue of state versus private ownership of the bed and banks of these rivers was raised in the course of discussions, resolution of the ownership question remained and was not a part of the agreement. The Division of State Lands reserved the right to require leases, easements, or licenses for any activity that resulted in a commercial interest within navigable waters of the state.

The parties to the September 14, 1992 mediated agreement were Coastwide Ready Mix, Oregon Concrete and Aggregate Producers Association, Oregon Department of Fish and Wildlife (ODFW), Oregon Department of Land Conservation and Development (DLCD), Oregon Division of State Lands (DSL), Tillamook County, Tillamook County Economic Development Commission, and Tillamook County Soil and Water Conservation District (SWCD). The key provisions of the agreement were as follows:

A. Established October 1, 1997 as the date of termination for the end of all commercial instream removal of gravel from the Kilchis, Miami, Trask, Wilson and Nestucca Rivers. To assure adequate supplies of commercial aggregate after 1997, Tillamook County agreed to complete the Goal 5 process and for purposes of Goal 5, instream aggregate would not be treated as a significant resource.
B. Set policies for instream gravel removal during the interim period from the date of the agreement through October 1, 1997.
C. Established a process to coordinate the gathering and review of information obtained from monitoring and research. Provide for a coordinated resource management plan to address instream habitat issues related to gravel extraction for noncommercial purposes.

D. Provided that after October 1, 1997 instream gravel removal would be allowed only for the purpose of soil conservation.

As part of the 1992 Mediated Agreement, Tillamook County agreed to complete its Goal 5 planning process. On June 30, 1993 the Board of Commissioners approved amendments to its Comprehensive Plan and Land Use Ordinance creating a Mineral and Aggregate Overlay Zone. On June 19, 1996 the Board of Commissioners approved an Ordinance Amendment identifying 128

existing or potential upland quarry sites. The Goal 5 process culminated on September 25, 1996, when the Board of Commissioners approved the application of the Mineral and Aggregate Overlay Zone to six aggregate sites throughout Tillamook County. A seventh site was added on December 10, 1997, with continuing opportunities to apply the overlay zone to additional sites. Consistent with the 1992 Agreement, instream aggregate was not treated as a significant resource in this planning process.

Pursuant to the 1992 Agreement, all commercial instream removal of gravel from the Kilchis, Miami, Trask, Wilson and Nestucca Rivers terminated on October 1, 1997.

[DRAFTERS NOTE: When members of the core planning team reviewed the following two paragraphs, there were comments about the lack of supporting evidence. I would appreciate if staffers such as Eric Mallory, Rich Felley and others with field familiarity could provide specific examples to support the underlined statements in these paragraphs.]

Following the cessation of commercial gravel extraction in 1997, gravel bars along the lower reaches of the affected rivers began to build up. The situation was exacerbated by the large amount of aggregate introduced into the river system by the February 1996 floods. The build up of gravel was occurring along the lower river reaches adjoining the county's limited resource of agriculture lands which support the local dairy industry.

By the winter of 1998-99, severe stream bank erosion was occurring opposite a number of gravel bars, causing the removal of important riparian vegetation and the loss of valuable pastureland. In one location, gravel accumulations were so extensive that the Wilson River was in danger of being diverted into the north Tillamook City business district through an old slough and the U.S. Army corps of Engineers subsequently undertook an emergency advance measure to stabilize that location. It also appeared that the increasing number of erosion sites might be raising the level of sedimentation entering the bay and estuary.

The 1999 Modification to the Mediated Agreement

By the summer of 1999 local concerns over the extent of gravel bar accumulation and related erosion brought the parties to the original 1992 mediated agreement back to the table. A modification to the 1992 agreement was executed during the first week of September 1999 addressing three issues.

Due to the lack of county staff and resources, the CRMP required by the 1992 agreement had not been completed. The 1999 modification defined the organizational structure, schedule, scope of work, funding and technical assistance required to complete the CRMP. This plan is the result.

Secondly, the modification provided for a pilot project designed to reduce stream bank erosion at three sites: one at RM 7.4 on Trask River, one at RM 4 on Wilson River and one at RM 3.5 and 3.2 on Kilchis River. These are described in the following section.

Finally, the Modification clarified that gravel removal in tidally influenced reaches of the various rivers was not restricted under the agreement but was subject to the regulations and permitting requirements of federal, state and local governments where applicable.

1999 Bar Skimming Pilot Project

The sites for the pilot project were each subject to stream bank erosion on the opposite side of the channel from buildups of gravel. Both local and state agencies, including the Oregon Department of Fish and Wildlife (ODFW) and the Oregon Division of State Lands (DSL) were involved in design of the project and mitigation measures.

At each site, in August 1999, ODFW staked the exterior boundaries of the gravel bar above the water surface elevation for protection of water quality and adjoining spawning habitat. Setbacks were maintained from the stream and adjoining riparian vegetation. No large woody debris was disturbed in the bar skimming. All work was completed prior to September 15, 1999.

A monitoring program for instream gravel removal on the project was established by Tillamook County and consisted of the following:

1. Permanent survey reference stations were installed so that gravel removal monitoring data was consistent with initial surveys. Upland benchmarks were established at appropriate locations and cross sections are to be taken annually to determine whether the riverbeds are accreting, eroding, or remaining unchanged.
2. Cross-sectional surveys of the gravel bar were made prior to instream gravel removal operations and after gravel removal has taken place.
3. Photo points were established at each project site for the purpose of documenting soil erosion before and periodically after instream work.

None of the projects involved building of a ramp or alteration of the stream bank. Gravel was picked up, loaded immediately into a truck and hauled off site to a stockpile area that was not a river or wetland. Each of the erosion sites (except at RM 3.2 on the Kilchis) also involved stream bank stabilization measures.

Kilchis River Site

An extensive gravel bar at RM 3.7 produced hydraulic conditions which caused bank erosion across from gravel bars at RM 3.5 and RM 3.2. Erosion control had already been completed at the lower site and consisted of tree revetment, willow planting and fencing. However, the flow conditions created by the upper bar were beginning to undermine the stream bank protection

measures at the lower site. At the upper site _____ cu yards were removed and _____ cu yards were removed from the lower site.

Wilson River Site

Extensive accumulations of gravel at the confluence of Dougherty Slough and Wilson River (RM 4.0) had increased flows into the Dougherty and were causing bank erosion along the slough affecting multiple landowners. The gravel buildup at this location was so extensive that the Wilson River was in danger of being diverted through the slough into the north Tillamook City business district and increasing flooding in that portion of the city. Under the project, _____ cu yards of gravel was removed, thereby reducing the flows into Dougherty Slough.

Trask River

Active erosion was continuing at this site (RM 7.4) even after work completed in 1998. The permit granted for this site involved the placement of rock, sloping the stream bank, tree planting and rearranging of 300 yards of gravel under an existing DSL permit (SP-15904). Under the pilot project _____ cu yards of gravel were removed.

ENVIRONMENTAL EFFECTS OF GRAVEL ACCUMULATIONS AND EXTRACTION

Extraction of alluvial material from within or near a stream bed has a direct impact on the streams physical habitat parameters such as channel geometry, bed elevation, substrate composition and stability, instream roughness elements (large woody debris, boulders, etc.) depth, velocity, turbidity, sediment transport, stream discharge and temperature (Rundquist 1980; Pauley et al. 1989; Kondolf 1994a, b; OWRRI 1995). OWRRI, (1995) states that:

Channel hydraulics, sediment transport, and morphology are directly affected by human activities such as gravel mining and bank erosion control. The immediate and direct effects are to reshape the boundary, either by removing or adding materials. The subsequent effects are to alter the flow hydraulics when water levels rise and inundate the altered features. This can lead to shifts in flow patterns and patterns of sediment transport. Local effects also lead to upstream and downstream effects.

Altering these habitat parameters has deleterious impacts on instream biota and the associated riparian habitat (Sandecki, 1989). For example, impacts to anadromous fish populations due to gravel extraction include: reduced fish populations in the disturbed area, replacement of one species by another, replacement of one age group by another, or a shift in the species and age distributions (Moulton, 1980). In general terms, Rivier and Seguier (1985) suggest that the detrimental effects to biota resulting from bed material mining are caused by two main

processes: (1) alteration of the flow patterns resulting from modification of the river bed, and (2) an excess of suspended sediment. OWRRI (1995) adds:

Disturbance activities can disrupt the ecological continuum in many ways. Local channel changes can propagate upstream or downstream and can trigger lateral changes as well. Alterations of the riparian zone can allow changes in channel conditions that can impact aquatic ecosystems as much as some in- channel activities.

One consequence of the interconnectedness of channels and riparian systems is that potential disruptions of the riparian zone must be evaluated when channel activities are being evaluated. For example, aggregate mining involves the channel and boundary but requires land access and

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material storage that could adversely affect riparian zones; bank protection works are likely to influence riparian systems beyond the immediate work area.

The potential effects of gravel extraction activities on stream morphology, riparian habitat, and

anadromous fishes and their habitats are summarized as follows:

1. Extraction of bed material in excess of natural replenishment by upstream transport causes bed degradation. This is partly because gravel "armors" the bed, stabilizing banks and bars, whereas removing this gravel causes excessive scour and sediment movement (Lagasse et al. 1980; OWRRI, 1995). Degradation can extend upstream and downstream of an individual extraction operation, often at great distances, and can result from bed mining either in or above the low water channel (Collins and Dunne 1990; Kondolf 1994a, b; OWRRI, 1995). Headcutting, erosion, increased velocities and concentrated flows can occur upstream of the extraction site due to a steepened river gradient (OWRRI, 1995). Degradation can deplete the entire depth of gravel on a channel bed, exposing other substrates that may underlie the gravel, which would reduce the amount of usable anadromous spawning habitat (Collins and Dunne, 1990; Kondolf, 1994a; OWRRI, 1995). For example, gravel removal from bars may cause downstream bar erosion if they subsequently receive less bed material from upstream than is being carried away by fluvial transport (Collins and Dunne, 1990). Thus, gravel removal not only impacts the extraction site, but may reduce gravel delivery to downstream spawning areas (Pauley et al., 1989).

2. Gravel extraction increases suspended sediment, sediment transport, water turbidity and gravel siltation (OWRRI, 1995). The most significant change in the sediment size distribution resulting from gravel removal is a decrease in sediment size caused by fine material deposition into the site (Rundquist, 1980). Fine sediments in particular are detrimental to incubating fish eggs as blockage of interstitial spaces by silt prevents oxygenated water from

reaching the eggs and removal of waste metabolites (Chapman, 1988; Reiser and White, 1988). High silt loads may also inhibit larval, juvenile and adult behavior, migration, or spawning (Snyder, 1959; Cordone and Kelly, 1961; Bisson and Bilby 1982; Bjornn and Reiser, 1991; OWRRI 1995). Siltation, substrate disturbances and increased turbidity also affect the invertebrate food sources of anadromous fishes (OWRRI, 1995).

3. Bed degradation changes the morphology of the channel (Moulton, 1980; Rundquist, 1980; Collins and Dunne, 1990; Kondolf, 1994a, b; OWRRI, 1995). Gravel extraction causes a diversion or a high potential for diversion of flow through the gravel removal site (Rundquist, 1980). Mined areas that show decreased depth or surface flow could result in migration blockages during low flows (Moulton, 1980). This may compound problems in many areas where flows may already have been altered by hydropower operations and irrigation. Even if the gravel extraction activity is conducted away from the active river channel during low water periods, substrate stability and channel morphology outside the excavated area's perimeter could be affected during subsequent high water events. As active channels naturally meander, the channel may migrate into the excavated area. Also, ponded water isolated from the main channel may strand or entrap fish carried there during high water events (Moulton, 1980; Palmisano, 1993). Fish in these ponded areas could experience higher temperatures, lower dissolved oxygen,

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increased predation compared to fish in the main channel, desiccation if the area dries out, and freezing (Moulton, 1980).

4. Gravel bar skimming significantly impacts aquatic habitat. First, bar skimming creates a wide flat cross section, then eliminates confinement of the low flow channel, and results in a thin sheet of water at baseflow (Kondolf, 1994a.) Bar skimming can also remove the gravel "pavement," leaving the finer subsurface particles vulnerable to entrainment (erosion) at lower flows (Kondolf, 1994a; OWRRI, 1995). A related effect is that bar skimming lowers the overall elevation of the bar surface and may reduce the threshold water discharge at which sediment transport occurs (OWRRI, 1995). Salmon redds (nests) downstream are thus susceptible to deposition of displaced, surplus alluvial material, resulting in egg suffocation or suppressed salmon fry emergence, while redds upstream of scalped bars are vulnerable to regressive erosion (Pauley et al., 1989). Gravel bar skimming also appears to reduce the amount of side channel areas, which can result in the reduction and/or displacement of juvenile salmonid fishes that use this habitat (Pauley et al., 1989).

5. Operation of heavy equipment in the channel bed can directly destroy spawning habitat, and produce increased turbidity and suspended sediment downstream (Forshage and Carter, 1973; Kondolf, 1994a). Additional disturbances to redds may occur from increased foot and vehicle access to spawning sites, due to access created initially for gravel extraction purposes (OWRRI, 1995).

6. Stockpiles and overburden left in the floodplain can alter channel hydraulics during high flows. During high water, the presence of stock piles and overburden can cause fish blockage or entrapment, and fine material and organic debris may be introduced into the water, resulting in downstream sedimentation (Follman, 1980).

7. Removal or disturbance of instream roughness elements during gravel extraction activities negatively affects both quality and quantity of anadromous fish habitat. Instream roughness elements, particularly large woody debris, play a major role in providing structural integrity to the stream ecosystem and providing critical habitat for salmonids (Koski, 1992; Naiman et al., 1992; Franklin et al., 1995; Murphy, 1995; OWRRI, 1995). These elements are important in controlling channel morphology and stream hydraulics, in regulating the storage of sediments, gravel and particulate organic matter, and in creating and maintaining habitat diversity and complexity (Franklin, 1992; Koski, 1992; Murphy, 1995; OWRRI, 1995). Large woody debris in streams creates pools and backwaters that salmonids use as foraging sites, critical over wintering areas, refuges from predation, and spawning and rearing habitat (Koski, 1992; OWRRI, 1995). Large wood jams at the head of gravel bars can anchor the bar and increase gravel recruitment behind the jam (OWRRI, 1995). Loss of large woody debris from gravel bars can also negatively impact aquatic habitat (Weigand, 1991; OWRRI, 1995). The importance of large woody debris has been well documented, and its removal results in an immediate decline in salmonid abundance (e.g., see citations in Koski, 1992; Franklin et al., 1995; Murphy, 1995; OWRRI, 1995).

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8. Destruction of the riparian zone during gravel extraction operations can have multiple deleterious effects on anadromous fish habitat. The importance of riparian habitat to anadromous fishes should not be underestimated. For example, Koski (1992) states that a stream's carrying capacity to produce salmonids is controlled by the structure and function of the riparian zone. The riparian zone includes stream banks, riparian vegetation and vegetative cover. Damaging any one of these elements can cause stream bank destabilization, resulting in increased erosion, sediment and nutrient inputs, and reduced shading and bank cover leading to increased stream temperatures. Destruction of riparian trees also means a decrease in the supply of large woody debris. This results in a loss of instream habitat diversity caused by removing the source of materials responsible for creating pools and riffles, which are critical for anadromous fish growth and survival, as outlined in Number 7, above (Koski, 1992; Murphy, 1995; OWRRI, 1995).

Gravel extraction activities can damage the riparian zone in several ways:

a. If the flood plain aquifer discharges into the stream, groundwater levels can be lowered because of channel degradation. Lowering the water table can destroy riparian vegetation (Collins and Dunne, 1990).

b. Long-term loss of riparian vegetation can occur when gravel is removed to depths that result in permanent flooding or ponded water. Also, loss of vegetation occurs when gravel removal results in a significant shift of the river channel that subsequently causes annual or frequent flooding into the disturbed site (Joyce, 1980).

c. Heavy equipment, processing plants and gravel stockpiles at or near the extraction site can destroy riparian vegetation (Joyce, 1980; Kondolf, 1994a; OWRRI, 1995). Heavy equipment also causes soil compaction, thereby increasing erosion by reducing soil infiltration and causing overland flow. In addition, roads, road building, road dirt and dust, and temporary bridges can also impact the riparian zone.

d. Removal of large woody debris from the riparian zone during gravel extraction activities negatively affects the plant community (Weigand, 1991; OWRRI, 1995). Large Woody debris is important in protecting and enhancing recovering vegetation in streamside areas (Franklin et al., 1995; OWRRI, 1995).

e. Rapid bed degradation may induce bank collapse and erosion by increasing the heights of banks (Collins and Dunne, 1990; Kondolf, 1994a).

f. Portions of incised or undercut banks may be removed during gravel extraction, resulting in reduced vegetative bank cover, causing reduced shading and increased water temperatures (Moulton, 1980).

g. Banks may be scraped to remove "overburden: to reach the gravel below. This may result in destabilized banks and increased sediment inputs (Moulton, 1980).

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h. The reduction in size or height of bars can cause adjacent banks to erode more rapidly or to stabilize, depending on how much gravel is removed, the distribution of removal, and on the geometry of the particular bed (Collins and Dunne, 1990).

PLANNING FRAMEWORK

First and foremost, this plan is driven by the particular resource issues that stem from the 1992 mediated agreement and its 1999 modification. This plan is intended to address stream bank erosion in relation to the buildup of gravel bars. While it is not intended as a means to restore commercial gravel operations in the rivers, it does recognize the opportunities for commercial byproducts from stream bank stabilization projects and off-channel/wetland creation.

As discussed below, while the objectives are therefore dictated by the Mediated Agreement, other local resource plans provide an important context for this planning process. The work by the Tillamook Bay National Estuary Project, local watershed councils and resource agencies, in the first instance provides many of the planning considerations but perhaps more importantly, some long-term approaches for dealing with the resource issues addressed in this plan.

As a result, this section presents information and rationale for the policies, standards and guidelines contained in the plan (short term approach), as well as opportunities for a much more comprehensive approach for managing the resource (long term strategy).

Existing Information

In April 1992, Tillamook Bay was nominated to the National Estuary Program (NEP). Tillamook Bay's nomination was approved, and seven years later a Comprehensive Conservation Management Plan (CCMP) was adopted. The CCMP sets forth a 10-year action plan to solve four priority problems in Tillamook Bay: water quality, key habitats, erosion and sedimentation, and flooding.

To provide the best available scientific information, the TBNEP conducted more than four years of scientific and technical study. An environmental characterization of the watershed was completed. The initial environmental characterization identified about 250 miles of salmon core areas and identified key habitats and estuarine resources. Other studies mapped roads, landslides and vegetation in the upper watershed. Later, scientific findings provided additional information about the sources and loading rates of bacteria and sediments to the estuary.

As a result of the environmental characterization phase, TBNEP developed a rich Geographical Information Systems (GIS) database. In Spring 1998, TBNEP collaborated with the Economic

Development Council (EDC) and Tillamook Bay Community College (TBCC) to establish the Tillamook Coastal Watershed Resource Center (TCWRC). TBNEP transferred the GIS database to the TCWRC and conducted a citizen watershed assessment of the Trask River through a class at the community college.

Although these and earlier studies provided a wealth of environmental information, scientists and stakeholders still have much to learn about how the ecosystem works and how to prioritize management. For these reasons, the CCMP recommends additional assessment and monitoring

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programs and applied research in selective areas. An important example, particularly as it relates to lower river management, is the recommendation to develop hydraulic/hydrologic computer

models for each river system. In the case of the Nestucca River which did not have the benefit of a National Estuary Project, the data gap is particularly acute and the need for such a hydrodynamic model is of greater importance.

Although plans are presently underway to develop hydrodynamic computer river models, these are at best three years away for the Tillamook Bay streams and even further in the future for application on the Nestucca River.

Consequently, this condition requires both short term and long term approaches or strategies for river management. The short term approach embodied in this plan uses the best available scientific information and existing river data from the TCWRC and elsewhere upon which to make management decisions and apply the policies, standards and guidelines set forth in this plan.

The long-term approach, on the other hand, would add the hydrodynamic computer model as it became available for each river system. At that time, revisions to this plan would be required. Each of these approaches is discussed in the following sections.

SHORT TERM APPROACH

In the absence of a hydrodynamic computer model, the short-term approach is to use the best available scientific information and existing river data from the TCWRC and other sources as a context for implementing this plan.

In terms of setting objectives for the plan, the 1999 modification to the Mediated Agreement (appendix A) stated that this plan should include the following two objectives:

1. Identify appropriate amounts, criteria and methods of instream gravel removal for noncommercial purposes; and
2. Agree upon the amount and type of bar formation that causes unacceptable stream bank erosion.

It appears from these two objectives that at least one "noncommercial purpose" identified particularly in the second objective would be gravel removal for the purpose of controlling "unacceptable stream bank erosion"

In order to address stream bank erosion it is first necessary to understand the relationship of gravel accumulations to stream bank erosion and its effects on other resource values in the lower rivers.

Channel morphology involves the shape and form of stream boundaries and associated boundary materials. Morphological features include channel width, irregularities of bank shape, bank slope, bank overhang or undercut, the presence of bars, riffles, rapids and pools within the channel and the corresponding depths of flow at different locations in the channel. They are quite important in establishing the flow hydraulics of the channel.

Some fairly consistent trends in channel morphology can be described from headwater to lowlands. For example, headwater reaches of streams are typified by steep slopes and narrow streams, dominated by step-pools and pool-riffle sequences. Lowland stretches of streams are typified by flat, wide meandering streams, dominated by numerous gravel bars and opposing eroding bank. Such gravel bars often occur on the inside bends of the lower stream reaches where slower water velocities cause the gravel to settle out (so-called "point bars"). The resulting bar formations force water velocities to the outside of the stream bend often resulting in stream bank erosion. The rate of erosion may be accelerated where riparian vegetation is lacking or where agricultural practices are conducted up to the edge of the stream bank.

Because such conditions typically occur in the lower river reaches there are serious implications for numerous natural and human resources in addition to the immediate effects on in-stream and riparian habitats. On the one hand the landscape of the lower reaches and adjoining floodplains of the Tillamook Bay are dominated by agricultural lands supporting the local dairy industry. Moreover, 90% of the County's 24,000 population lives along the 10% coastal strip, resulting in interspersed areas of residential and business developments, roads, bridges and drainage works along the lower rivers. An increase in gravel accumulations and corresponding stream bank erosion presents a series of resource concerns and challenges. However, the standards and guidelines in this plan present an opportunity to avoid or minimize such resource conflicts while protecting and enhancing riparian and aquatic habitat.

In specific cases, gravel removal can be used to remove stresses on stream banks and streambeds resulting in greater stabilization. In this manner, gravel removal can result in reduced needs for fill, less stream bank stabilization, and greater stability of some spawning beds. (OWRRI, 1995)

"Skimming" of sediment (removing the tops of river gravel bars without excavating below the summer water level) is a method of controlling or minimizing stream bank erosion.

Because channel bars are submerged by higher flows, bar skimming generally occurs at times of seasonal low flow. This approach eliminates the need for work in the wetted channel and maximizes the amount of material exposed, and hence maximizes the amount of material that may be removed. The bars are almost always attached to the banks and are frequently located on the inside of bends.

"Bar skimming" results in a reduction in the scoring stresses exerted by the flow against an eroding bank, by removing material from the opposite bank and enlarging the river cross section to reduce flow velocities. In general, wide, shallow stream channels without complexity are not a goal of fish habitat management. Thus such projects should be beneficial to the extent they

control channel widening and filling. However, skimmed bars may reform quickly after the first high water event. As a result, bar skimming projects should include adjacent riparian vegetation plantings to minimize subsequent scouring.

This plan also incorporates the concept of a gravel trap. This involves the removal of material at a single gravel bar located at the upper edge of the flood plain in rivers with excess gravel accumulations in the lower reaches. Under this plan, gravel traps could be employed on such bars upstream of where excessive gravel accumulations are causing erosion at multiple

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downstream point bars. This approach involves a periodic bar skimming as a gravel trap before the accumulations move further downstream to multiple erosion sties.

Under this approach only one bar on each river would be skimmed in those years where accumulations warranted. By limiting the removal to the exposed summertime bar the remaining untouched portions of the cross section would ensure that the delivery of down stream gravel nourishment will continue. Moreover, the standards for such projects will ensure the same high level of salmonid and environmental protections as with the standards for point bar erosion control projects described in this plan.

Additionally, the potential sites for gravel trap will be selected where a landowner proposes a site that meets certain criteria. These include such requirements as an existing road, ready access onto the bar without the need to construct a ramp and a demonstrated need based on significant erosion at multiple downstream point bars.

There appear to be a number of environmental benefits from limiting removal operations to a single gravel trap on each system rather than multiple downstream sites if excessive accumulations otherwise continued unchecked; there are fewer entries into riparian zones, site disturbances are minimized and there appear to be less opportunity for unplanned consequences by conforming operations to a single site.

As noted earlier, it is important that the rate of gravel extraction not exceed the rate of resupply over an extended period of time. One approach for managing the amount of in-channel gravel removed is the so-called "safe yield" method, where extraction is limited to removal of only excess accumulations. This requires the ability to evaluate gravel recruitment at any site of interest. In the short term, until the hydrodynamic computer model can be completed and a sediment budget calculated, the standards and guidelines in this plan incorporate conservative provisions to ensure that cumulative gravel extraction does not exceed recruitment within any river system.

Further, as a way of carrying out the key habitat goals of the CCMP for Tillamook Bay and

restoring or enhancing similar attributes on the Nestucca River, another objective of this plan would be to protect and enhance riparian, instream and wetland habitats, as well as stabilize stream banks using alternatives to rip rap.

Lakes and ponds remaining from floodplain gravel operations or specifically created can also provide a valuable resource for establishing additional aquatic habitat. These features could provide significant juvenile rearing areas and adult feeding where hydraulic connection can be made to the riverine system. Gravel operations could be used as a flood control tool, to enhance habitat complexity, to increase wetland habitat, or as a component in floodplain restoration. Rivers in which lateral habitat has been filled or altered could benefit from carefully designed gravel operations to restore the original habitat complexity such as a lost channel. (OWRRI, 1995) Pilot projects will be encouraged under the standards and guidelines set forth below where ecological benefits to riparian/aquatic ecosystems can be attained.

STREAM BANK STABILIZATION

Policy. Stream bank stabilization projects involving gravel removal will be considered where:

1. The gravel bar is located immediately adjacent to or directly across from the eroding stream bank and a hydraulic relationship can be inferred.

2. The magnitude of erosion is determined to be significant and could not be controlled in the short term by bioengineering alone.

3. There is no net loss of fish and wildlife resources, their habitat or public uses of these resources;

4. There is no gravel removal from bars where anadromous fish spawning is documented;

5. The amount of gravel removed, when considered with other removal projects on the riverine system, does not exceed the capacity to recharge the resource;

6. Gravel removal occurs only on bars that are exposed during low summer flows;

7. No removal occurs below summer water levels.

8. Such projects include elements of non-structural stream bank stabilization such as riparian plantings, fencing for livestock and stream barbs where appropriate. Such

stream bank stabilization projects should be consistent with the county's Riparian Ordinance and the CCMP, in the case of Tillamook Bay basin streams.

Standards for Erosion Control Projects

- The volume of material removed from salmonid spawning waterway reaches shall not exceed the recruitment rate at each removal site.
- Removal shall be conducted in a manner that does not significantly alter natural waterway channel characteristics (e.g., gradient, velocity, depth, width, and meanders) of salmonid spawning waterway reaches.
- Removal in lower river reaches, where salmonid spawning does not occur, shall maintain shallow water areas.
- Removal shall be conducted in a manner that does not result in headcutting and permanent lowering of the bed in salmonid spawning waterway reaches.
- Removal shall be timed to avoid conflicts with critical life-stages of aquatic organisms and recreational users and shall follow ODFW in-water work guidelines.
- Natural waterway features (including sloughs, backwaters, oxbows, wetlands and high flow channels) shall be protected during removal operations.

- Pits, ponds, and potholes on gravel bars within the waterways shall be leveled or connected to the waterway immediately following removal operations to prevent stranding fish during high flows.
- Relative stability of the waterway beds, banks, and islands shall be maintained. There shall be no accelerated erosion or accretion resulting from the removal operation.
- Stockpiles and removed materials shall be placed above the riparian vegetation and floodplain.
- Crushing or washing operations shall be confined to upland areas outside the reach of high waters. Sediments shall be removed prior to returning wastewater to the waterway.
- Large Woody debris shall be disturbed only as necessary to remove gravel and shall be replaced upon completion of the project.

- Removal activity or equipment shall remain outside the wetted perimeter of the waterway, unless the project results in direct benefit to fish and wildlife habitat, recreation, erosion/ flood control, or public safety.

- Removal of gravel shall avoid eliminating or degrading important aquatic habitats (including spawning, rearing, and resting areas).

- To prevent fish stranding during periods of high flows, removal areas shall be sloped in a continuous upward gradient perpendicular to the watercourse. No pits, ponded areas, or potholes shall remain after removal.

- Stable, vegetated islands and bars shall remain undisturbed.

- Water shall not be diverted from nor within the natural waterway during removal operations.

- Gravel bar material shall not be removed to a depth below the elevation of the water surface at the time of operation unless the project results in direct benefit to fish and wildlife habitat, recreation, erosion/flood control, or public safety.

- On gravel bars, an undisturbed leave strip at least 10 feet wide shall be maintained between the removal area and the water line unless otherwise directed by ODFW or DSL. No equipment shall be operated in this zone.

- An NRCS designed and approved stabilization project shall be completed along the eroded stream bank as directed by NRCS. Stabilization shall include, but not be limited to riparian plantings of willow and other plant species, and fencing for livestock exclusion. All such projects shall be completed prior to October 15 of the year in which the gravel is removed. Plantings shall be completed by April 1st of the following year.

Guidelines

- Pre and post project surveys and monitoring of gravel recruitment and physical and hydrologic parameters shall be conducted in accordance with specifications of ODFW and DSL.

- Approach ramps to removal areas, if needed, should be constructed by filling rather than cutting. Fill must be removed immediately following the gravel removal operations. In such cases a project permit form the U.S. Army Corps of Engineers may be required.

- The waterway aesthetics should be considered during removal operations.
- Upon completion of removal, sites should be shaped, reclaimed, and revegetated to enhance habitat and aesthetic values as directed by ODFW and NRCS.
- Removal operations should not destroy riparian vegetation. Where impacts to vegetation are unavoidable, revegetation with compatible species will be required.
- Gravel removal depth should not exceed the level required to maintain existing habitat values.

OFF-CHANNEL HABITATS

Policy

Pilot projects for creating or restoring ponds, lakes, channels and associated riparian plant communities will be encouraged where: 1.) hydraulic connections can be made to the riverine system; and 2.) ecological benefits to riparian/aquatic ecosystems can be attained.

Wetland, Pond and Lake Creation Standards

- Slopes shall have a horizontal to vertical ratio of 10:1 or 20:1 to increase the zone widths of plant communities.
- The addition of topsoil shall be required where plant colonization is desired as determined by NRCS and ODFW.
- Organic material such as root wads and large wood shall be added.
- Plans shall mimic natural systems in size, slope, vegetation and hydrology.

Wetland, Pond and Lake Creation Guidelines

- Large rather than small areas should be enhanced.
- Shoreline lengths should be maximized by use of irregular, undulating edges.
- Variety in topography should be retained and high banks should be avoided on all sides of the pond.

- Vegetation should be managed for both horizontal and vertical heterogeneity.
- Some unvegetated areas should be retained.
- Some dead vegetation should be used including snags, logs and leaf litter.
- Ponds and lakes should be designed with irregular shorelines and a variety of depths (i.e., 25% in benches and bars less than 2 feet deep; 25% in areas 2 to 6 feet deep, and half the lake more than 10 feet deep.
- Increase primary productivity with hay, straw, topsoil, mulch or other organic matter to increase invertebrate production needed by wildlife. Temporary flooding may be useful.
- Reduce predator consumption by employing brush piles for cover underwater or on land. Islands as nesting sites may reduce predator loss. Waterfowl brood rearing areas must be close to nesting sites to reduce excessive duckling losses.
- Provide perches and loafing sites for birds: snags, floating rafts, and rocks or small islands.
- Encourage nesting by leaving dead trees with woodpecker cavities, adding nest boxes and by reducing human disturbances.
- If accelerating plant succession is desirable, it can be accomplished by (a) not reforesting; (b) placing ponds where they will not be flooded, and (c) use of fire or moving to setback succession. In this case, the pond must have a good clay seal so it will hold permanent water.
- Special management tools may be employed for particular species such as raw vertical banks for Nesting Bank and Rough-Winged Swallows and Kingfisher.

Off-Channel Habitat Guidelines

- The width of the off-channel needs to be no wider than the width of the connecting waterway.
- A downstream sinuous connection should be made.
- The depth of the outlet needs to be set to the low summer flow of the connecting waterway to ensure flow out of the channel during low flows.
- The preferred design is an open flow channel.

- A connection should be made only if the off-channel depth is 35 feet or less.
- Topsoil should be stockpiled for future reclamation.
- The depth of the channel should be no deeper than the connecting waterway.

- The depth of the channel should be appropriate for the productivity of fish and wildlife species in the vicinity. Generally the depth of the channel should not average more than 12-18 feet.
- Riparian vegetation should be established along both banks of the off-channel as directed by ODFW and NRCS.
- Livestock fencing should be installed where required by the presence of livestock.

GRAVEL TRAPS

Policy. Bar skimming projects at locations serving as gravel traps will be considered where:

1. **The location, size and physical characteristics will make a significant contribution to reduction of erosion at multiple point bars downstream with fewer potential environmental consequences than would otherwise be possible if individual projects were conducted at each downstream site;**
2. **There is no net loss of fish and wildlife resources, their habitat or public uses of these resources;**
3. **The amount of gravel removed, when considered with other gravel removal projects on the riverine system, does not exceed the capacity of the river system to recharge the resource.**
4. **Gravel removal occurs only on bars that are exposed during low summer flows.**
5. **No removal occurs below summer water levels.**

Standards for Gravel Traps

- The site must be served by an existing roadway into the riparian area.
- Sites will be given preference where construction of a ramp is not required.

- The volume of material removed from salmonid spawning waterway reaches shall not exceed the recruitment rate at each removal site.

- Removal shall be conducted in a manner that does not significantly alter natural waterway channel characteristics (e.g., gradient, velocity, depth, width, and meanders) of salmonid spawning waterway reaches.

- Removal in lower river reaches, where salmonid spawning does not occur, shall maintain shallow water areas.

- Removal shall be conducted in a manner that does not result in headcutting and permanent lowering of the bed in salmonid spawning waterway reaches.

- Removal shall be timed to avoid conflicts with critical life-stages of aquatic organisms and recreational users and shall follow ODFW in-water work guidelines.

- Natural waterway features (including sloughs, backwaters, oxbows, wetlands and high flow channels) shall be protected during removal operations.

- Pits, ponds, and potholes on gravel bars within the waterways shall be leveled or connected to the waterway immediately following removal operations to prevent stranding fish during high flows.

- Relative stability of the waterway beds, banks, and islands shall be maintained. There shall be no accelerated erosion or accretion resulting from the removal operation.

- Stockpiles and removed materials shall be placed above the riparian vegetation and floodplain.

- Crushing or washing operations shall be confined to upland areas outside the reach of high waters. Sediments shall be removed prior to returning wastewater to the waterway.

- Large Woody debris shall be disturbed only as necessary to remove gravel and shall be replaced upon completion of the project.

- Removal activity or equipment shall remain outside the wetted perimeter of the waterway, unless the project results in direct benefit to fish and wildlife habitat, recreation, erosion/ flood control, or public safety.

- Removal of gravel shall avoid eliminating or degrading important aquatic habitats (including spawning, rearing, and resting areas).

- To prevent fish stranding during periods of high flows, removal areas shall be sloped in a continuous upward gradient perpendicular to the watercourse. No pits, ponded areas, or potholes shall remain after removal.

- Stable, vegetated islands and bars shall remain undisturbed.

- Water shall not be diverted from nor within the natural waterway during removal operations.

- Gravel bar material shall not be removed to a depth below the elevation of the water surface at the time of operation unless the project results in direct benefit to fish and wildlife habitat, recreation, erosion/flood control, or public safety.

- On gravel bars, an undisturbed leave strip at least 10 feet wide shall be maintained between the removal area and the water line unless otherwise directed by ODFW or DSL. No equipment shall be operated in this zone.

Guidelines

- Pre and post project surveys and monitoring of gravel recruitment and physical and hydrologic parameters shall be conducted in accordance with specifications of ODFW and DSL.

- Approach ramps to removal areas, if needed, should be constructed by filling rather than cutting. Fill must be removed immediately following the removal operations. In such cases a project permit form the U.S. Army Corps of Engineers may be required.

- The waterway aesthetics should be considered during removal operations.

- Upon completion of removal, sites should be shaped, reclaimed, and revegetated to enhance habitat and aesthetic values as directed by ODFW and NRCS.

- Removal operations should not destroy riparian vegetation. Where impacts to vegetation are unavoidable, revegetation with compatible species will be required.

- Gravel removal depth should not exceed the level required to maintain existing habitat

values.

LONG TERM STRATEGY

On October 13, 1997 Congress authorized the U.S. Army Corps of Engineers (USACE) to conduct a study of the Tillamook Bay estuary and watershed in order to address ecosystem restoration measures and the evaluation of other water resource needs including flood damage reduction pursuant to the Energy and Water Development Appropriations Act of 1998, PL. 105-62.

The subsequent reconnaissance study by the USACE identified seven alternatives, four of which provided some level of ecosystem restoration for shellfish and several critical species of anadromous fish. Since ecosystem restoration was a high priority output, the report concluded there was a strong federal interest in conducting the feasibility study.

The USACE subsequently developed a Project Study Plan for the proposed Feasibility Study, the total cost of which is estimated to be $3,382,000. Of this amount, the County must provide $882,000 as its cash contribution with the additional $845,000 as in-kind services.

The single largest component of the proposed feasibility study is the development of a comprehensive computer hydrodynamic model of the Tillamook Bay Watershed which combines watershed hydrology with floodplain hydraulics and tidal influence. It will produce a one-dimensional unsteady state hydraulic model of the Wilson, Trask, Tillamook, Kilchis and Miami Rivers.

The Wilson River will be modeled from the mouth to river mile (RM) 11.40. The Trask River will be modeled from the mouth to RM 10.95. The Tillamook River will be modeled from the mouth to RM 6.9. The Kilchis River will be modeled from the mouth to RM 6.0. The Miami will be modeled from the mouth to RM 5.0. Each model will be fully developed and include cross sections at approximately every quarter-mile and all flood plain areas up to the 500-year flood level. Each model will be calibrated to high water data that will be collected during the study period.

As part of Tillamook County's in-kind contribution to the project, the Tillamook County surveyor and his crew are currently undertaking the fieldwork and cross sections that will be used in the model. Work on the Trask River has been completed and the survey crew is now working on the Wilson River. Cross sections are taken at bridges as well as specific measurements of bridge features. As will be discussed below, not only is this data important to the proper functioning of the hydrodynamic model, but it is crucial for the operation of the sedimentation module and the long term approach to river management.

The MIKE 11 is the particular model proposed for this project. MIKE 11 is a comprehensive, one-

dimensional modeling system for the simulation of flows, sediment transport and water quality in estuaries, rivers, irrigation systems and other water bodies. It is a 4th generation modeling package designed for microcomputers with DOS or UNIX operating systems and provides the user with an efficient interactive menu and graphical support system with logical and systematic layouts and sequencing of the menus. The package was introduced on the market in 1989; the number of installations worldwide exceeds 300.

A characteristic feature of the modeling system is its integrated modular structure which allows computational modules to be added if and when required, without complicating model computations when only basic modules are required. MIKE 11 has basic computational modules for hydrology, hydrodynamics, advection-dispersion, water quality and cohesive and non-cohesive sediment transport. Add-on computational modules are available for most of these basic modules. The model system is equipped with two database systems (from which relevant data are automatically extracted during model simulations) and with a graphical and digital pre- and post processor for presenting results and input data.

The database systems can be used independently as general hydrological and topographical databases for river basins, and can be connected with the add-on module, Hydrological Information System (HIS) providing time series data correlation and statistical analysis, or to the Geographical Information System (GIS). The link between MIKE II and the Arc/Info system provides enhanced graphical presentation of for example:

- Topography, cross-sections of rivers and flood plains
- Two- and three- dimensional images of land and water surfaces (flood characteristics maps)
- Tables and contouring of inundation depths.

Of greatest importance to the long-range approach for this plan, however, is the add on module for cohesive and non-cohesive sediment transport. It is this module that will determine the volume of sediment entering the upper extremity of the flood plain. It will aid in the determination of the sediment budget for each river and indicate the most likely locations for accretions and erosion. In sum, it provides a dynamic proactive river management tool to replace the reactive short-term approach of this present plan.

However, it is important to note that the $3,382,000 cost of the feasibility study does not include funds for the sedimentation module. It will not be possible; therefore, to implement the long-term approach to river management on the streams affected by this plan unless and until funding is secured to not only purchase the sedimentation module but more importantly to complete the

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data collection for operation of the module. Tillamook County's $852,000 cash matching funds

are made up of a grant/loan package which includes a $420,000 Special Public Works (SPW) loan that the County must repay over the next 30 years. Tillamook County has exhausted its SPW borrowing capacity and no other county funds are available for funding this module. Although the USACE will pay for 50% of the $(_____) cost of the purchase and data collection for the module, the balance will have to come from a non-federal source. This situation presents an opportunity for DSL, ODFW and the Oregon Aggregate Producers Association or its members to contribute to a project which will have a multitude of benefits to such participants.

PROCEDURES, PERMITS AND FEES

Overview

The administrative structure of this plan has two goals. The first goal is to facilitate a cumulative effects analysis for each stream by having all plans for stream bank stabilization projects and gravel traps reviewed at the same time each year. The second is to create a "one-stop" review and approval process once a landowner has submitted the required plans and supporting information. But due to the complexity of the existing permit process, multiple jurisdictions and differing "public interests", it is first necessary to understand the present regulatory framework.

Waterway Ownership and Responsibilities

The State of Oregon owns most land beneath tidal and commercially navigable waters, extending up to mean or ordinary high water. Title to these lands came from the federal government when Oregon was admitted to the Union in 1859. The public trust doctrine gives public waterway rights to navigate on or over the water, to harvest fish and shellfish, and to use the water as a highway of commerce (OSU Extension, 1982).

For non-navigable streams, private ownership includes the beds and banks, but not the water.

Several public agencies at federal, state and local levels are involved in regulating development activities and uses along streams where the bed ownership may be either public or private. The basis for such responsibilities derives from various laws.

Section 10 of the Rivers and Harbors Act of 1899 gave authority to the U.S. Army Corps of Engineers to regulate obstructions to navigable waters. This is done through a permit system.

Section 404 of the Clean Water Act (and its amendments) regulates the disposal of dredged or fill material in "water of the United States." This is a broader term than the "navigable waters" of Section 10, covering traditionally navigable waters, tributary streams, and wetlands.

The U.S. Army Corps of Engineers administers the Section 10 permit program jointly with the Section 404 program. This broadens the jurisdiction considerably. The Environmental Protection Agency reviews and must approve or disapprove each permit under its Section 404 responsibilities.

Every decision on Section 10 and/or Section 404 permits involves other federal laws. The National Environmental Policy Act of 1969 requires that all federal actions, including decisions on permits, be evaluated in terms of effects on the quality of the human environment; if significant effects are perceived, then an Environmental Impact Statement must be prepared. The Fish and Wildlife Coordination Act requires consultation by the U.S. Army Corps of Engineers with the U.S. Fish and Wildlife Service and Oregon Department of Fish and Wildlife. National Marine Fisheries Service is also involved. The Coastal Zone Management Act of 1972 affects permit decisions and, in Section 307, requires that the Section 10/404 permits be consistent with Oregon's federally approved coastal management plan.

Why a Permit?

Oregon places a high value on clean water, healthy aquatic life and habitats, and natural scenic areas. State policy emphasizes "the protection, conservation and best use of the water resources of this state." The policy covers not only water and materials for domestic, agricultural, and industrial use but also habitats and spawning areas for fish, avenues for transportation and sites for commerce and recreation.

Consequently, any activity that is likely to lessen the use and value of water and aquatic resources is cause for state concern and management action. Because salmonids have historically been regarded as species of great cultural, recreational and commercial value, particular emphasis has been given to the protection of salmon habitat in the waters of the State. This emphasis has been heightened with listings of various salmonids under the Endangered Species Act and with the subsequent Oregon Plan for Salmon and Watersheds.

Oregon has developed a "Removal-Fill Law" and a supporting administrative program to regulate the removal and filling of materials in waters of the State. The program is designed to conserve, protect, and manage Oregon's water resources for the benefit of present and future generations. Authority is centralized in the Director of the Division of State Lands for control of the removal of material from the beds and banks or filling of the waters of the State. The Director must consider all beneficial uses of water when administering fill and removal statutes.

This program emphasizes the use of permits to regulate activities that could pose potential concern for water and aquatic systems. The permit process gives government agencies and the general public opportunities before the permits are implemented to become aware of activities that could jeopardize the State's water resources. Through this process, unsuitable activities may be prevented and acceptable activities may be regulated to assure that they are conducted under conditions that protect the beneficial values inherent in the impacted natural resources.

The federal permit process, when it applies to a proposed action, has been combined with the State's permit process. Thus, the U.S. Army Corps of Engineers and the ODSL have a joint permit application for the numerous proposed activities that involve federal and state jurisdictions. The joint process facilitates application processing and review. Ultimately if the proposed action needs federal and state action and is approved, separate permits are issued from the U.S. Army Corps of Engineers and ODSL. A permit must be obtained from both agencies before the applicant proceeds.

Beyond federal and state involvement, Tillamook County has laws and ordinances which it must enforce. There are three separate sections of its Land Use Ordinance which regulate stream bank activities: estuarine regulations (Section 3.140), riparian area regulations (Section 4.080) and the flood hazard overlay zone provisions (Section 3.060). These regulations reflect the County's obligation to implement various federal laws (e.g. floodplains and wetlands) and state laws (e.g. Goal 16 Estuarine Resources), as well as the county's need for efficient and effective land use administration.

For What Activities is a Permit Needed?

A State permit is needed for any activity that would cause the removal or movement by artificial means (alteration) of more than 50 cubic yards of material or the fill by artificial means of 50 or more cubic yards of material within the bed and banks of the waters of the State of Oregon unless specifically exempted by Statute. The threshold for such a permit is now 5 cubic yards in areas designated as essential salmonid habitat (ESH). All five rivers addressed in this plan are designated as ESH. "Removal" means the taking of material in any waters of this state or the movement of material on or within the bed of such waters, including channel relocation. "Fill" means the deposit by artificial means of material at one location in any waters of this state. "Material" means rock, gravel, sand, silt, and other inorganic substances removed from waters of this state and any materials, organic or inorganic, used to fill waters of this state.

In addition, the State Land Board approval is required for the filling or removal of any material, regardless of the amount, within the bed and banks of any waterway designed as a State Scenic Waterway.

Typical examples of activities and projects requiring State permits include:

- Gravel removal
- Dredging
- Gold mining
- Rip rap placement
- Land reclamation

- Channel alteration or relocation
- Pipeline crossings, and
- Construction of bulkheads
- Fill for stream crossings, culverts and bridges

The need for a State permit is based upon the magnitude of activity. The fill-removal-alteration activity for local rivers addressed in this plan must exceed 5 cubic yards of material before a permit is required by law. Because the location for the activity must be stated in the application for a permit, it is assumed that all such activity occurs at one site.

Exemptions exist for emergency repairs, although the Director of ODSL must be notified within 24 hours and shall inspect the site and deny or approve the emergency activity.

Exemptions exist for fill or removal in non-navigable waterways for forest management practices in forestlands. Exemptions also exist for the purpose of constructing, operating and maintaining

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dams or other diversions for which permits, preliminary permits, licenses or certificates are issued under separate statutes. And the "Fill-Removal law" does not apply to the federal government acting in its capacity of navigational servitude.

A county permit is required for placement of fill in a flood plain or channel and for structural stream bank stabilization.

For What Water Bodies and Within What Boundaries are Permits Needed?

The expression "Waters of the State of Oregon" means all natural waterways of the State. These include rivers, constantly flowing streams, intermittent streams, lakes, ponds, wetlands, tidal and non-tidal bays, other bodies of water in this state, navigable or non-navigable, and even that part of the Pacific Ocean within the jurisdiction of the State. State applicability should be clear for large lakes and for perennial rivers (those flowing year-around). But the law also applies to small natural ponds, intermittent streams (those that seasonally go dry), overflow channels, and wetlands. Wetlands include swamps, bogs, freshwater marshes, and saltwater marshes; they are defined as those areas that are inundated or saturated often enough to support a prevalence of vegetation adapted for life in standing water or saturated soil.

Permits are needed for activities within the bed and banks of these waters.

For non-tidal rivers and lakes, the bank full stage or the upper edge of a wetland represents the boundary for fill-removal permits. For tidal waters the highest measured tide applies to tidelands and the line of non-aquatic vegetation applies to wetlands. Along the Pacific Ocean coast, fill-

removal permits are needed ocean-ward of the highest measured tide or the upland vegetation line, whichever is higher.

In all cases, jurisdiction extends across the area typically reached by water during high water stage, but not across the floodplain unless wetlands are present. However, outside of these limits land-use and zoning statutes apply. Collectively, there is a multi-layered pattern of federal, state and county responsibilities that affect and constrain the actions that may be taken by waterway owners.

Division of State Lands Permit Process

Individuals or entities wishing to undertake an activity that falls within the purview of the Oregon's "Fill-Removal Law" must make application to the Director of the ODSL for a permit. The application must be made on forms provided by the Director. An application fee must be paid. This pays for the review of the application. The fee is not refundable if the application is denied.

The completed application is reviewed by the staff of the ODSL. The necessary investigations must be made to develop a factual basis for a permit decision. As part of this process, the ODSL must consult with and obtain the views of others through a formal process of public notices and mailings. The application is circulated to the appropriate local governments, state and federal agencies, adjacent property owners, and interested citizens for review and comments. Agencies and other units of government are given 45 days to submit comments after receiving a request for comment form the ODSL.

Oregon State agencies included in this process include the Department of Fish and Wildlife, the Department of Environmental Quality, the Department of Land Conservation and Development, the Department of Agriculture Division of Soil and Water Conservation, the Water Resources Department, the Department of Economic Development, the State Parks Division, the State Historic Preservation Office, the Department of Geology and Mineral Industries, and any other affected State agency. Tillamook County is also notified through this process.

Federal agencies are provided with application notice for projects where no separate U.S. Army Corps of Engineers notice has been issued. These agencies include the U.S. Fish and Wildlife Service, the National Marine Fisheries Service, the U.S. Army Corps of Engineers, and the Environmental Protection Agency.

The comments received from all sources help the ODSL to evaluate the proposed project against the requirements in law and administrative rules, as well as to prepare operating conditions under which a project can be approved.

For removal projects, the ODSL decision time is 45 days from receipt of a completed application. For fill projects, the decision time is 90 days.

Permits are either denied or issued with conditions.

Approval of the project by the appropriate local government planning office is necessary before the ODSL will issue a permit. The "one-stop" permit process contained in this plan (described below) is designed to address this issue.

If the application is denied, the reason for denial is stated in writing. If known, acceptable alternatives are pointed out. An applicant whose application has been denied has the right to request a hearing before the ODSL.

If the applicant receives a permit but the applicant objects to the conditions, there is also the opportunity for a hearing before the State Land Board.

The process for requesting a hearing is stated on the denial letter or on the front sheet of the permit.

Hearings before the ODSL to challenge a permit that has been issued can be requested by adjacent property owners and by other who can show legal standing. In certain cases, a permit can be suspended by the Director of the ODSL during the hearing process or during any subsequent appeal to the Oregon Court of Appeals or the State Supreme Court.

County Permit Process

A County development permit is also required for some projects contemplated by this plan. A copy of the application is attached in the appendix. However as noted below, a "one-stop" permit process has been established. The County permit will be processed and reviewed simultaneously with the DSL permit. Upon approval of the application by DSL the County permit will be issued to qualified applicants at the same time DSL issues its permit.

"ONE-STOP" ADMINISTRATIVE PROCEDURES FOR THIS PLAN

A. Stream Bank Stabilization & Gravel Trap Projects- Each year prior to April 15 any landowner whose lands are subject to stream bank erosion resulting from accumulations of sediments or who wishes to operate a gravel trap on a river subject to down stream erosion from gravel bars may submit a letter generally outlining a sediment removal project.

As soon as reasonably practicable after April 15 a meeting shall be held by all the affected

resource agencies including staff from Tillamook County Community Development Department, Tillamook County Soil and Water Conservation District, Oregon Department of Fish and Wildlife, Natural Resource Conservation Service, and Division of State Lands. The applicant and his representative will also be invited to attend. Site visits will also be scheduled.

Upon completion of the site visits and review of all proposed projects the resource agencies shall make recommendations to DSL on project selection for that summer. The recommendations shall be based on an analysis of cumulative effects for each river system by considering the following criteria:

1. the severity of erosion at the site;
2. the extent to which gravel accumulations are contributing to the erosion;
3. the extent to which other non-structural stabilization solutions might be successful in the absence of the proposed project;
4. the prevalence, location and size of other gravel bars on the river system;
5. the degree to which the proposed project protects and enhances salmonid habitat;
6. the estimated gravel recruitment over the previous winter on each river system generally;
7. the estimated gravel accumulation at the proposed project site over the previous winter; (The extent to which the landowner can provide documentation on these criteria based on photo points, surveys or other data would be helpful).
8. the extent to which the project combined with the proposed non-structural stream bank measures will provide stabilization at the site;
9. in the case of a gravel trap, the extent to which it would contribute to the reduction of downstream erosion.

Upon the selection of projects for that year, all landowners submitting project requests will be notified in writing of project selections. Those landowners whose projects were selected shall thereafter submit the required application and information as set forth below and in the appendix of this plan. The required cross section surveys shall be performed by an engineer or surveyor at landowner expense. The completed application together with the required attachments shall be submitted to Tillamook County with the state and county filing fees. At the time a completed application is submitted to the County, the DSL shall initiate its required 45-day public review and comment.

B. Development of Off-Channel Habitats- Landowners who desire to develop off-channel habitats may submit applications at any time throughout the year. Because of the tremendous variations in the kinds, scope and complexity of off-channel habitats, landowners wishing to

pursue such projects are advised to consult with ODFW or other resource agencies in advance of

initiating any work on an application. (See "Assistance in Developing Permits" below.)

Due to the potential natural resource benefits associated with completing such projects, every effort will be made to facilitate a similar "one-stop" permit process. The local county staff and state agency personnel are committed to conducting joint review meetings and site visits in order to accommodate such projects.

Permit Contents

The basic information required in the written application forms includes the following:

- name, address and phone number of landowners;
- names and addresses of adjacent landowners;
- location of the project;
- description of the proposed actions and purposes for the project;
- description of the proposed actions to restore the site;
- mitigation plan, if the project involves inter-tidal or tidal marsh areas; and
- photographs of the site.

Drawings and maps must accompany the application. These must show the following:

- the location of the proposed project site with sufficient accuracy to allow easy identification;
- a plan view of the project site and proposed alterations, including:
    - locations of waterways and wetlands involved
    - lines of high water and low water
    - the location of removal or fill
    - adjacent properties
    - location of existing trees, shrubbery and vegetation
- cross-section views showing details of the proposed project.

The instruction forms and attached example drawings indicate to the applicant what information should appear and how it might be presented on the application form.

Certain types of proposed activities require that the applicant provide additional information in the application. If it is determined that the proposed project may cause substantial adverse effects to aquatic life and habitat, the applicant may be required to provide documentation of

existing conditions and resources, and to identify the potential impacts of the proposed project.

Assistance in Developing Permits

It is the policy of Tillamook County and other natural resource agencies to work with applicants. This is done to assist in the design of worthwhile projects so that they will have a minimum impact on water resources and adjacent properties. In so doing, we seek to avoid adverse impacts while looking for opportunities to restore or even enhance resources that have been left in poor condition by prior natural and human activities.

The County and other agencies can provide assistance in several ways. They can arrange pre-application conferences to discuss design issues, mitigation requirements, and procedural matters. They can also assist in identifying regulatory jurisdictions that may be involved in a particular proposed project or activity.

Examples of situations where this assistance has been particularly beneficial involve wetlands and aquatic habitats. Mitigation and enhancement have helped restore some of the State's wetland resources that had been converted to other uses years to decades ago. The ODSL, County and other state agencies (e.g. ODFW and GWEB) have worked closely with permit applicants and landowners to achieve important improvements in degraded fish habitat as part of permitted activities.

Such assistance represents a "pro-active" approach to natural resource management by working through individuals and other entities at times when they have specific plans and needs that fall within the purview of the law.

Mitigation and Habitat Development Fund

There are substantial benefits to the upland landowner from stream bank stabilization projects involving gravel removals. By eliminating the erosion, valuable soils are saved and upland uses are preserved. In the case of projects on navigable waterways, by stemming the encroachment of the waterway, the upland title of the adjoining private ownership is maintained. There is also a significant revenue component to the property owner with a gravel trap.

In order to ensure that there is an appropriate balance of benefit to environmental resources from gravel extraction projects for stream bank stabilization it is a policy of this plan that a portion of the proceeds from either the sale of the aggregate removed as part of the project or permit fees be placed in a fund for use in furthering mitigation measures and habitat development.

[DRAFTER'S NOTE: several resource agencies and others have proposed that landowners who receive permits for gravel traps or stream bank erosion projects pay some type of fee or payment to be used for the purposes set forth below. Some of the ideas for fees are described as follows. Please provide your input as to how much of a fee or payment, if any, should be paid.

- **75% of the proceeds from the sale of the gravel**

or

- **75% of the proceeds up to a maximum of 50¢ per yard**

or

- **Some other amount?**

or

- **None.**

The Board of Commissioners shall by formal order create the Mitigation and Habitat Development fund into which shall be deposited all amounts paid to the County from sale proceeds or mitigation fund fees.

All monies deposited in the Mitigation and Habitat Development Fund shall be paid to the Tillamook County Soil & Water Conservation District under an intergovernmental agreement to be used exclusively as follows:

1. Not more than 25% shall be used for administering a Mitigation and Habitat Development program.
2. The balance shall be used by TCSWCD on mitigation and habitat development projects that include riparian plantings, streamside fencing, construction of stream bars, other nonstructural stream bank stabilization, placement of large woody debris in channels, development of off channel habits and wetland creation.

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