

APPENDIX 4

Minimum Criteria

Attachment B: Appendix 4: Minimum Criteria of the Biological Opinion (2008) and Errata Letter (May 14, 2009)

Appendix 4: Minimum Criteria

It is the purpose of the following criteria to maintain streams and floodplains in their natural state to the maximum extent possible so they support healthy biological ecosystems, by: 1) assuring that flood loss reduction measures under the NFIP protect natural floodplain functions and riparian habitat, and the natural processes that create and maintain fish habitat, and 2) preventing or minimizing loss of hydraulic, geomorphic, and ecological functions of freshwater and estuarine floodplains and stream channels.

In all 100-year floodplain areas (SFHAs) the following criteria apply:

1. Restrict Development in the Riparian Buffer Zone for all watercourses including off channel areas (areas outside this zone but within the Special Flood Hazard Area) to provide necessary protection to the RBZ. The RBZ is the greater of the following:

- 150 feet measured perpendicularly from ordinary high water for Type S (Shorelines of the State) and F (fish-bearing) streams; 100 feet for N (nonsalmonid-bearing) streams, lakes and marine shorelines, and 50 feet for U (untyped) streams,
- the Channel Migration Zone²² plus 50 feet; and
- the mapped Floodway.

The Riparian Buffer Zone is an overlay zone that encompasses lands as defined above on either side of all streams, and for all other watercourses including off channel areas. The RBZ is a no-disturbance zone, other than for activities that will not adversely affect habitat function. Any property or portion thereof that lies within the RBZ is subject to the restrictions of the RBZ, as well as any zoning restrictions that apply to the parcel in the underlying zone. Restrictions in this area apply to all development, per the definition of development.²³ Uses that are not

²² The lateral extent of likely movement along a stream reach during the next one hundred years with evidence of active stream channel movement over the past one hundred years. Evidence of active movement can be provided from aerial photos or specific channel and valley bottom characteristics. A time frame of one hundred years was chosen because aerial photos and field evidence can be used to evaluate movement in this time frame. Also, this time span typically represents the time it takes to grow mature trees that can provide functional large woody debris to most streams. In large meandering rivers a more detailed analysis can be conducted to relate bank erosion processes and the time required to grow trees that function as stable large woody debris.

With the exception of shorelands in or meeting the criteria for the "natural" and "rural conservancy" environments, areas separated from the active channel by legally existing artificial channel constraints that limit bank erosion and channel avulsion without hydraulic connections shall not be considered within the CMZ. All areas, including areas within the "natural" and "rural conservancy" environments, separated from the natural channel by legally existing structures designed to withstand the 100-year flood shall not be considered within the CMZ. A tributary stream or other hydraulic connection allowing listed species fish passage draining through a dike or other constricting structure shall be considered part of the CMZ.

²³ Development. Any man-made change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations, storage of equipment or materials, or any other activity which results in the removal of substantial amounts of vegetation or in the alteration of natural site characteristics located within the area of special flood hazard.

permitted unless shown not to adversely affect water quality, water quantity, flood volumes, flood velocities, spawning substrate, and/or floodplain refugia for listed salmon, include the following: new buildings, including accessory buildings; new impervious surfaces; removal of native vegetation; new clearing, grading, filling, land-disturbing activity or other “development” (see definition), other than for the purpose of replacing non-native vegetation with native vegetation, and for other approved restoration work; septic tanks and drain fields, dumping of any materials, hazardous or sanitary waste landfills; receiving areas for toxic or hazardous waste or other contaminants; and, stream relocations, unless the primary function of the action is to restore natural ecological function.

In the RMZ the following uses are allowed: [1] repair or remodel of an existing building in its existing footprint, including buildings damaged by fire or other casualties; [2] removal of noxious weeds; [3] replacement of non-native vegetation with native vegetation; [4] ongoing activities such as lawn and garden maintenance; [5] removal of hazard trees; [6] normal maintenance of public utilities and facilities; and [7] restoration or enhancement of floodplains, riparian areas and streams that meets Federal and State standards

2. Protect fish habitat and flood storage in the remaining 100-year floodplain (outside the RMZ) by either:

- a.) Prohibiting development in the 100-year floodplain, OR
- b.) Providing compensation for any effects to floodwater storage and fish habitat function within the 100-year floodplain.

Any development in the 100-year floodplain must be compensated, for example, through the creation of an equivalent area and volume of floodwater storage and fish habitat through a balanced cut and fill program. The new flood storage/habitat area must be graded and vegetated to allow fish refugia during flood events and return to the main channel as floodwaters recede without creating stranding risks. In addition, equivalent area, if not located on site, must be located in priority floodplain restoration areas identified in the ESU Recovery Plan for listed species.

3. Mitigate for all indirect effects of development in the floodplain (effects to stormwater, riparian vegetation, bank stability, channel migration, hyporheic zones, wetlands, LWD, etc.) such that equivalent or better salmon habitat protection is provided.

Stormwater. Reduce flood volumes and stormwater runoff from new development by ensuring that increased volumes of stormwater reach the river at the same frequency, timing, and duration as historical runoff. Low Impact Development (LID) methods are required to treat and infiltrate runoff as described in PSAT 2002. These methods generally include various practices for infiltrating stormwater to provide water quality treatment, match historical runoff durations, and preserve base flows.

Riparian vegetation: Maintain or replace riparian function by providing equivalent area, diversity, and function of riparian vegetation as currently exists on the site (per WDFW riparian management recommendations (Knutson and Naef 1997).

Bank Stability: Bank stabilization measures along salmonid-bearing streams, channel migration zones, and along estuarine and marine shorelines must be minimized to the maximum extent possible. If bank stabilization measures are necessary, bioengineered armoring of streambanks and shorelines must be used (per the Integrated Streambank Protection Guidelines 2003 (for riverine shorelines) or the State Shorelines Guidelines on bank stabilization (2003) (for estuarine and marine shorelines).

Channel migration. No activity is allowed that limits the natural meandering pattern of the channel migration zone, however, natural channel migration patterns may be enhanced or restored (see Rapp and Abbe 2003, for delineating channel migration zones).

Hyporheic zones. No activity is allowed that interferes with the natural exchange of flow between surface water, groundwater and the hyporheic zone, however, natural hyporheic exchange may be enhanced or restored (see Bolton and Shelberg. 2001 for hyporheic zone issues).

Wetlands. Wetland function must be maintained or replaced by providing equivalent function per Washington State Department of Ecology (McMillan 1998) regulations.

LWD. Any LWD removed from the floodplain must be replaced in kind, replicating or improving the quantity, size, and species of the existing LWD (per WDFW Aquatic Habitat guidelines).

In the 100-year floodplain outside the Riparian Buffer Zone the following apply:

- 1) For buildable lots partially in the floodplain, require structures to be located on the portion of the lot outside of the mapped floodplain. Where a buildable lot is fully in the floodplain, structures must be sited in the location that has the least impact on listed salmon, e.g., located as far from the stream or river as possible on the lot, placing structures on the highest land on the lot, orienting structures parallel to flow rather than perpendicular, and avoiding disruption of active hyporheic exchange on a site.
- 2) Require zoning to maintain a low density (e.g., 5-acre lots or greater) of floodplain development to reduce the damage potential within the floodplain to both property and habitat, and help maintain flood storage and conveyance capacity.
- 3) All structures must be set back at least 15 feet from the RBZ and shall be sited as close to the 100-year floodplain boundary as possible.
- 4) In an effort to site structures as far away from the watercourse and RBZ as possible, the applicant will be apprised of the elevations of the 10-year and 50-year floods in detailed study

areas at the same time that the (city, county) provides the 100-year elevation as a part of the permit review. The applicant, in addition to plotting the 100-year elevation near the building site, will also plot the 10 and 50-year elevations on the land. The purpose is to show the applicant the significantly lower risk of placing the structure further away from the watercourse.

5) Structures built using post, pier, piling or stemwall construction may require less mitigation than structures built on earth fill, but must provide equivalent mitigation for lost fish habitat and indirect effects from development.

6) Creation of new impervious surfaces²⁴ shall not exceed 10 percent of the surface area of the portion of the lot in the floodplain unless mitigation is provided.

7) Removal of native vegetation must leave 65 percent of the surface area of the portion of the lot in the floodplain in an undeveloped state; the 65 percent pertains to the entire portion of the lot in the floodplain, including that area in the RBZ, where removal of native vegetation is generally prohibited.

8) The proposed action must be designed and located so that it will not require new structural flood protection (e.g., levees).

9) During the floodplain permit review process, applicants shall be notified that their property contains land within the Riparian Buffer Zone and/or 100-year floodplain, and that the applicant is required to record a Notice on Title on the property before a permit may be issued. Applicants shall be further notified that development in the RBZ and 100-year floodplain can only occur according to the above criteria.

10) New road crossings over streams are prohibited.

11) Concepts of cluster development, density transfer, credits and bonuses, planned unit development, and transfer of development rights shall be employed wherever possible.

12) Any flood information that is more restrictive or detailed than the FEMA data can be used for flood loss reduction and/or fisheries habitat management purposes, including data on channel migration, more restrictive floodways, maps showing future build-out and global climate change conditions, specific maps from watershed or related studies that show riparian habitat areas, or similar maps.

In the RBZ and the floodplain the following re-development criteria apply:

²⁴ Any material or land alteration (i.e. clearing, grading, etc.) which reduces or prevents absorption of storm water into the ground. That hard surface area which either prevents or retards the entry of water into the soil, water that had entered under natural conditions prior to development; and/or that hard surface area that causes water to run off the surface in greater quantities or at an increased rate of flow from that present under natural conditions prior to development. Common impervious surfaces include, but are not limited to: roof tops, walkways, patios, driveways, parking lots or storage areas, concrete or asphalt paving, gravel roads, and packed earthen materials.

1) Require that expansion to existing buildings in the floodplain be limited to no more than 10 percent of the existing footprint (i.e., when building and other structures such as garages are substantially damaged or expanded in the floodplain), unless mitigation for any adverse effects to floodplain habitat is provided, as described above .

4. **Communities choosing to implement the mitigation option** (2.b. above) must track the projects for which they issue floodplain development permits, including effects to flood storage, fish habitat, and all indirect direct of development. The expected development effects, the equivalent mitigation provided, and the success of the mitigation in replacing the affected fish habitat and flood storage functions shall be reported to FEMA on a semi-annual basis (according to the monitoring requirements in RPA element 3.D)



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Washington State Habitat Office
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Lacey, WA 98503

NMFS Tracking
No.: 2006/00472

May 14, 2009

Mr. Mark Eberlein
Regional Environmental Officer
U.S. Department of Homeland Security
Federal Emergency Management Agency
Region X
130-228th Street SW
Bothell, Washington 98021-97963755

Re: Second Notice of Error and Correction in Endangered Species Act Section 7 Formal Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for the on-going National Flood Insurance Program carried out in the Puget Sound area in Washington State. HUC 17110020 Puget Sound.

Dear Mr. Eberlein:

The referenced biological opinion prepared by the National Marine Fisheries Service and provided to the Federal Emergency Management Agency in September, 2008 contains some errors as listed briefly below. As with the first errata sheet provided to you in October of 2008, the full replacement text to correct these errors is enclosed, along with an explanation regarding the corrections.

1. Corrections to a footnote regarding the stabilization benefits of riparian vegetation,
2. Corrections to an example regarding potential floodplain fill at the Harvey Airfield (on the Snohomish River),
3. Correction to the take statement for Thurston County (amount of take and take exemption),
4. Correction to the take statement regarding the timing of implementation of the RPA,
5. Revisions to Appendix 3 identifying Tier 1 and Tier 2 river systems and communities,
6. Revisions to Appendix 4 regarding the width of Riparian buffers,
7. Corrections to Appendix 4 erroneously identifying the RBZ as the RMZ, and
8. Corrections to Appendix 4 indentifying mitigation/compensation for effects.

If you have questions, please contact DeeAnn Kirkpatrick of National Marine Fisheries Service's Washington State Habitat Office at (206) 526-4452 or via email at deeann.kirkpatrick@noaa.gov.

Sincerely,

Steven W. Landino
Washington State Director
For Habitat Conservation

Enclosure



Second Errata List

1. **Harvey Airfield correction, page 10** (end of first paragraph): Text should appear as follows:

“In a fourth example, the Snohomish County Council proposed submitting a CLOMR request to FEMA to amend the current Flood Insurance Rate Map designation from density fringe to floodway fringe in the Snohomish Urban Growth Area (including 290 acres of floodplain in the area of the Harvey Airfield Industrial Area and 30-40 other businesses). The floodway fringe designation allows many commercial and industrial uses that are prohibited in the density fringe designation. The County never submitted the proposed CLOMR request to FEMA, however UGA landowners are currently proposing to submit a LOMR request to FEMA for the same floodway designation change action.”

2. **Footnote correction, page 85:** The document repeats footnote number seventeen twice, and omits footnote number 16. The Footnote 17 at the bottom of page 85 (continuing onto page 86) should be deleted, and replaced with Footnote 16. Text on page 85 should read as follows:

“Some of the literature establishing the stabilization benefits of vegetation to river banks has been generated by the COE’s own research center based in Vicksburg, Mississippi.¹⁶

¹⁶ See: <http://el.erdc.usace.army.mil/publications.cfm?Topic=techreport&Code=watqual>”

3. **Take Statement Correction, page 171:** The Extent of Anticipated Take contains a bullet list showing the amount of take from anticipated floodplain fill, per county. Thurston County was omitted from the list. A bullet point should be added at the bottom of the list, reading as follows:

“Thurston County at the rate 2.8 percent average growth rate over 49 square miles of floodplain equaling a loss of 1.3 square mile loss of floodplain function per year.”

Take Statement Correction, page 173: The Take Exemption contains a bullet list showing the exempted amount of take per county. Thurston County was omitted from the list. A bullet point should be added at the bottom of the list, reading as follows:

“In Thurston County at the rate of 2.8 percent per year, equaling a loss of 1.3 square miles of floodplain per year.”

Second Errata List, con't

4. **Take Statement Correction, page 171:** Erroneously states the timetable for implementation of the RPA elements for communities affecting Tier 1 fish populations. This text currently indicates one year from the issuance of the biological opinion as the timetable for RPA compliance. This text should read as follows:

“Because the prioritization for implementing the RPA requires that communities affecting Tier 1 populations implement the revisions within two years, the chance that fish will be exposed to unmitigated floodplain development in any particular location influencing Tier 1 populations, is only two percent.”

Take Statement Correction, page 174: Erroneously states the time table for implementation of the RPAs in order to retain the protections of the take exemption. The text should read as follows:

“Take that occurs from actions not in compliance with the RPA (above) is not exempt – specifically, take at the above described rates is exempt only for a period of two years following the issuance of this Opinion in NFIP jurisdictions influencing Tier 1 populations, for 2 and one-half years in NFIP jurisdictions influencing Tier 2 populations, and for 3 years in all other NFIP jurisdictions, and is exempt only to the extent that the mitigation required by the RPA is provided.”

5. **Appendix 3, corrections, pages 218-220:** Some communities were included erroneously, some omitted erroneously, and some associated with the incorrect waterbody. The bullet lists from this appendix should be replaced with the following corrected lists:

“The following communities influence Tier 1 Puget Sound Chinook populations:

- Whatcom County and all NFIP communities adjacent to the mainstem and North and South Forks of the Nooksack River (Bellingham, Lummi Nation, Ferndale, Lynden, Everson, and Nooksack),
- Skagit County and all NFIP communities, adjacent to the Skagit River, Sauk, and Suiattle Rivers (La Conner, Mount Vernon, Burlington, Sedro Woolley, Lyman, Hamilton, and Concrete).
- Island County and all NFIP communities adjacent to estuarine floodplains (Coupeville, Langley, Oak Harbor).
- Snohomish County and all NFIP communities adjacent to the Sauk River (Darrington).
- King County and all NFIP communities adjacent to the White River (Enumclaw, Pacific).
- Pierce County and all NFIP communities adjacent to the Puyallup (Tacoma, Fife, Puyallup, and Sumner) and White Rivers (Buckley).
- Pierce and Thurston Counties and all NFIP communities adjacent to the Nisqually River (Yelm).
- Mason County and all NFIP communities adjacent to the Skokomish River (Skokomish Tribe).
- Jefferson County and all NFIP communities adjacent to estuarine areas (Port

Townsend and Port Angeles), and adjacent to the Hamma Hamma, Duckabush, and Dosewallips Rivers.

- Clallam County and all NFIP communities adjacent to the Elwha (Lower Elwha Tribe and Lower Elwha) and Dungeness Rivers (Sequim).

The following communities influence Tier 1 Hood Canal summer-run chum populations:

- Clallam County and all NFIP communities adjacent to Snow and Salmon Creeks, and Jimmycomelately Creek.
- Jefferson County and all NFIP communities adjacent to the Big and Little Quilcene, Hamma Hamma, Duckabush, and Dosewallips Rivers.
- Kitsap and Mason County and all NFIP communities adjacent to the Union, Tahuya, and Lilliwaup Rivers.

The following communities influence Puget Sound Chinook Tier two populations:

- Snohomish County and all NFIP communities adjacent to the mainstem and North Fork and South Fork of the Stillaguamish River (Stanwood, Arlington, and Granite Falls).
- King and Snohomish Counties, and all NFIP communities adjacent to the Skykomish (Monroe, Sultan, Gold Bar, Index, and Skykomish) and Snoqualmie Rivers (Everett, Marysville, Snohomish, Duvall, Carnation, Snoqualmie, and North Bend).
- Pierce and King Counties, and all NFIP communities adjacent to the Puyallup River tributaries upstream of Sumner (Orting, South Prairie, Wilkeson), and the Green River (Seattle, Tukwila, Kent and Auburn).
- Kitsap County and all NFIP communities affecting estuarine areas (Bainbridge Island, Bremerton, Port Orchard, Poulsbo).

The following communities support Hood Canal chum Tier two populations:

- Jefferson County and all NFIP participating communities adjacent to Chimacum Creek.
- Kitsap County, and all NFIP communities adjacent to Big Beef and Anderson Creeks.
- Mason County and all NFIP communities adjacent to Dewatto, and Skokomish Rivers, and Finch Creek (Skokomish Tribe).

All other Puget Sound NFIP communities are a third priority for implementing RPA elements 2-6.”

6. **Appendix 4 correction, page 222 (second paragraph):** Should read as follows:

“In all 100-year floodplain areas (SFHAs) the following criteria apply:

1. Restrict development in the Riparian Buffer Zone for all watercourses including off channel areas (areas outside this zone but within the Special Flood Hazard Area) to provide necessary protection to the RBZ. The RBZ is the greater of the following:

- 250 feet measured perpendicularly from ordinary high water for Type S (Shorelines of the State) streams, 200 feet for Type F streams (fish bearing) greater than 5 feet wide and marine shorelines, and 150 feet for Type F streams less than 5 feet wide, for lakes. For type N (nonsalmonid-bearing) perennial and seasonal streams a 150 foot or 225 foot buffer applies, depending on slope stability (the 225 foot buffer applies to unstable slopes),
- the Channel Migration Zone² plus 50 feet; and
- the mapped Floodway.

The Riparian Buffer Zone is an overlay zone that encompasses lands as defined above on either side of all streams, and for all other watercourses including off channel areas. The RBZ is a no-disturbance zone, other than for activities that will not adversely affect habitat function. Any property or portion thereof that lies within the RBZ is subject to the restrictions of the RBZ, as well as any zoning restrictions that apply to the parcel in the underlying zone.”

7. **Appendix 4 correction, page 223 (second paragraph and first heading):** Erroneously identifies the RBZ as the RMZ in two places on this page and should be corrected as follows:

“In the RBZ the following uses are allowed:..” and

“2. Protect fish habitat and flood storage in the remaining 100-year floodplain (outside the RBZ) by either:”

² The lateral extent of likely movement along a stream reach during the next one hundred years with evidence of active stream channel movement over the past one hundred years. Evidence of active movement can be provided from aerial photos or specific channel and valley bottom characteristics. A time frame of one hundred years was chosen because aerial photos and field evidence can be used to evaluate movement in this time frame. Also, this time span typically represents the time it takes to grow mature trees that can provide functional large woody debris to most streams. In large meandering rivers a more detailed analysis can be conducted to relate bank erosion processes and the time required to grow trees that function as stable large woody debris.

With the exception of shorelands in or meeting the criteria for the "natural" and "rural conservancy" environments, areas separated from the active channel by legally existing artificial channel constraints that limit bank erosion and channel avulsion without hydraulic connections shall not be considered within the CMZ. All areas, including areas within the "natural" and "rural conservancy" environments, separated from the natural channel by legally existing structures designed to withstand the 100-year flood shall not be considered within the CMZ. A tributary stream or other hydraulic connection allowing listed species fish passage draining through a dike or other constricting structure shall be considered part of the CMZ.

8. Appendix 4 correction, in sections 4.2.b and 4.3, page 223: Erroneously identifies the need for compensation or mitigation for any effects, and all indirect effects, and should be corrected to state the need for compensation for any “adverse” effects and all “adverse” indirect effects.