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Reasonable & Prudent Alternative Element 3: Floodplain Management Criteria

Summary

- A. FEMA shall modify its Floodplain Management Criteria ASAP for PS NFIP communities to carry out the following measures:
1. Allow no development in the Riparian Buffer Zone (RBZ, identified as the greater of the channel migration zone plus a 50-foot buffer, the riparian buffer width specified by stream type, and the floodway), OR
 2. Local jurisdiction must demonstrate to FEMA that proposed RBZ development does not adversely affect salmon habitat needs.
 3. In addition to either 1 or 2 above, either:
 - a) Prohibit development in the 100 yr floodplain, OR
 - b) Avoid, rectify or compensate for any loss of floodplain storage and fish habitat from development in the 100 yr floodplain (outside RBZ). Any development allowed must use Low Impact Development methods to minimize or avoid stormwater effects. Any indirect adverse effects must be mitigated.
 - c) Structural improvements/repairs resulting in greater than 10% increase in structure footprint must mitigate adverse effects to fish or their habitat.
- B. FEMA shall ensure that all PS NFIP communities implement land-use management measures consistent with criteria in 3.A.¹
1. Prioritized FEMA implementation schedule and benchmarks
 - a) 35% of all PS NFIP jurisdictions shall implement RPA 3.A. criteria, including 100% of Tier 1 jurisdictions (see Appx 3)
 - b) 75% of all PS NFIP jurisdictions shall implement RPA 3.A. criteria, including 100% of Tier 2 jurisdictions (see Appx 3)
 - c) 100% of all PS NFIP jurisdictions shall implement RPA 3.A. criteria
 2. FEMA shall report annually to NMFS until all PS NFIP jurisdictions have implemented RPA 3.A.
- C. Until all PS NFIP jurisdictions have implemented RPA 3.A., they must track and report to FEMA all floodplain permits issued. Any unmitigated

¹ The original times frames for compliance with RPA element 3 were modified by letter from NMFS to FEMA on September 10, 2010, extending the time frame for compliance for tier 1 and 2 communities to be uniform with the tier 3 communities. The compliance date is now September 22, 2011 for all three tiers.

development must be mitigated by FEMA. Any mitigation shall comport with WA State Fish Passage & Habitat Enhancement Restoration Programmatic (7-08-08).

D. Any communities allowing projects in the floodplain using the mitigated cut and fill option, shall report to FEMA semi-annually. If NMFS finds that any mitigation actions taken are not fully effective, FEMA shall ensure further mitigation is provided through RPA 6 or other means available to the community (e.g., mitigation banks).

Reasonable & Prudent Alternative *full text*

The FEMA shall modify its implementation of the NFIP minimum criteria in NFIP communities in the Puget Sound Region in order to prevent and/or minimize the degradation of channel and floodplain habitat, as described below. In addition FEMA will report progress to NMFS on an annual basis on all sub-elements below.

A. As soon as possible upon issuance of this Opinion, FEMA shall revise its implementation of the current NFIP minimum criteria so that the following measures, necessary for protecting listed salmonids, are carried out in the Puget Sound Region as described in Appendix 4 (Minimum Criteria) and summarized below:

1. Allow no development in the floodway, the CMZ plus 50 feet (as identified according to Ecology 2003), and the riparian buffer zone (RBZ, as described by the Department of Natural Resources 2007 stream typing system and WDFW's 1997 stream buffer guidelines), and floodway (as mapped by the FIRM). OR
2. The local jurisdiction with permitting authority must demonstrate to FEMA that any proposed development in the FEMA designated floodway, the CMZ plus 50 feet (as identified according to Ecology 2003), and the riparian buffer zone (RBZ, as described by the Department of Natural Resources 2007 stream typing system and WDFW's 1997 stream buffer guidelines) does not adversely affect water quality, water quantity, flood volumes, flood velocities, spawning substrate, and/or floodplain refugia for listed salmonids.
3. In addition to either 1 or 2 above, either:

a. Prohibit development in the 100-year floodplain, OR

b. If development within the 100-year floodplain but outside the RBZ, is permitted, any loss of floodplain storage shall be avoided, rectified or compensated for. An example of compensation is the creation of an equivalent area and volume of floodwater storage and fish habitat through a balanced cut and fill program that provides fish refugia habitat and prevents fish stranding. Additionally, indirect adverse effects of development in the floodplain (effects to stormwater, riparian vegetation, bank stability, channel migration, hyporheic zones, wetlands, etc.) must also be mitigated such that equivalent or better salmon habitat protection is provided. (See Appendix 4 for more detail on how to comply with this criteria). Using option 3.A.3.b will require tracking the projects that occur and reporting to FEMA on a semi-annual basis (see 3.D. below).

For development within the 100-year floodplain permitted under 3.A.3.b, construction in the floodplain shall use Low Impact Development (LID) methods (generally requiring infiltration of all on-site stormwater), such as those described in the Low Impact Development Technical Guidance Manual for Puget Sound (Puget Sound Action Team and WSU/Pierce County Extension 2002) to minimize or avoid stormwater effects.

4. Any improvements or repairs to existing structures that result in a greater than 10 percent increase of the structure footprint must mitigate for any adverse effects to species or their habitat as described in 3.A.3.b.

B. The FEMA shall implement RPA Element 3.A by ensuring that all participating NFIP communities in the Puget Sound region implement land-use management measures consistent with the criteria as soon as practicable, but in no event later than three years from the date of this Opinion.

1. The FEMA shall focus its implementation efforts first on communities located in areas of "Tier 1" salmon populations, secondly on communities located in areas of "Tier 2" salmon populations, and then on the remaining Puget Sound NFIP communities (see Appendix 3 for

an explanation of Tier 1 and 2 populations and a list of jurisdictions where they are located). The FEMA shall demonstrate compliance with the following benchmarks:

- a. Thirty-five percent of NFIP jurisdictions in the Puget Sound Region shall have implemented the criteria set forth in RPA Element 3.A within two years of this issuance of this opinion, including 100 percent of Tier I jurisdictions;
- b. Seventy percent of NFIP jurisdictions in the Puget Sound Region shall have implemented the criteria set forth in RPA Element 3.A within two and a half years of the issuance of this opinion, including 100 percent of Tier 2 jurisdictions; and
- c. One hundred percent of NFIP jurisdictions within the Puget Sound Region shall have implemented the criteria set forth in RPA Element 3.A within three years of the issuance of this Opinion.

2. Until all Puget Sound communities have implemented the criteria set forth in RPA Element 3.A, the FEMA shall report annually to NMFS on the status of its efforts to implement the RPA and the number of Puget Sound NFIP jurisdictions that have implemented the revised criteria.

C. Interim Actions. In the time period between the issuance of this Opinion, and the full implementation of RPA 3.A by participating communities, FEMA shall advise the Puget Sound NFIP communities that they must keep track of all floodplain permits that they issue and report this information to FEMA on an annual basis. The FEMA will provide this information to NMFS annually, highlighting any permits that allowed development affecting channel or floodplain habitat, or resulted in indirect effects to salmonid habitat from stormwater, removal of riparian vegetation, bank armoring, changes in the CMZ, large wood input, or gravel recruitment, etc. If NMFS finds that any unmitigated actions affecting listed species have occurred as a result of these permits, NMFS will advise FEMA to this effect, and FEMA will ensure that mitigation is provided prior to the next reporting period. Mitigation actions shall comport with those habitat restoration and enhancement actions consulted on in the programmatic consultation between NMFS

and the COE, entitled *Washington State Fish Passage and Habitat Enhancement Restoration Programmatic*, NMFS Tracking No. 2008-03598.

D. Long term actions. Communities that have adopted the minimum criteria option allowing equivalent cut and fill (3.A.3.b. above), must report to FEMA on the number of projects that take place in the floodplain and the effectiveness of the mitigation. If based on FEMA's annual reporting, NMFS finds that the mitigation is not fully effective, FEMA shall ensure that further mitigation is provided for these actions through RPA Element 6 or through other means available to the community (e.g., mitigation banks) and shall reflect these actions in the next annual report. Mitigation actions shall comport with those habitat restoration and enhancement actions consulted on in the programmatic consultation between NMFS and the COE, entitled *Washington State Fish Passage and Habitat Enhancement Restoration Programmatic*, NMFS Tracking No. 2008-03598.

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:

- 250 feet measured perpendicularly from ordinary high water for Type S (Shorelines of the State) streams, 200 feet for Type F streams (fish bearing streams) greater than 5 feet wide, 150 feet for Type F streams less than 5 feet wide, and 150 feet for N (nonsalmonid-bearing) streams, lakes and marine shorelines².

- the Channel Migration Zone³ 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.⁴ Uses that are not 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

³ 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.

⁴ 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.

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 RBZ 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 RBZ) 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 surfaces⁵ 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).

⁵ 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.

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:

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).