

Jessi Roberts

From: Travis Bouma
Sent: Thursday, April 16, 2015 1:48 PM
To: Erin Page; Cliff Strong
Cc: ryan@futurewise.org; Amy Dearborn
Subject: FEMA BiOp Meeting Today
Attachments: FEMA ESA Review Checklist.docx

Erin,
I was out in the field all day yesterday and I forgot to check my calendar when I was out there today so sorry I missed the meeting (I usually check the day before if I have any meetings but I was not in the office). Please call me to discuss, I have attached a review checklist we have used as a tool on what to look for when reviewing for compliance.

Regards,



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Effort to Integrate the Requirements of the FEMA BiOp with the Flood Protection Regulations

Recommendations by Ryan Ericson, with comments/edits by EPage, ADearborn, & Cstrong; additional edits Ryan Ericson

Title 17 Flood Damage Prevention

Chapter 17.04 General Provisions

17.04.010 Findings of fact.

The findings of fact are the following:

- A. The flood hazard areas of Whatcom County are subject to periodic inundation which results in loss of life and property, health and safety hazards, disruption of commerce and governmental services, extraordinary public expenditures for flood protection and relief, and impairment of the tax base, all of which adversely affect the public health, safety and general welfare.
- B. These flood losses are caused by the cumulative effect of obstructions in areas of special flood hazards which increase flood heights and velocities, and when inadequately anchored, damage uses in other areas. Uses that are inadequately flood-proofed, elevated, or otherwise protected from flood damage also contribute to the flood loss.
- C. ~~A requirement for participating local jurisdictions in the National Flood Insurance Program (NFIP) is to ensure that any type of floodplain development does not have an adverse effect on listed species or their critical habitat.~~

Chapter 17.12 Administration

17.12.020 Administrative department – Designated.

The department of public works is appointed to administer and implement this title by granting or denying development permit applications in accordance with its provisions.

- A. ~~The department of planning and community development services is appointed to administer and implement environmental review of this title by granting or denying development permit applications in accordance with this Title's provisions and tile 16.16 Critical Areas.~~

17.12.030 Administrative department – Duties and responsibilities.

- A. The duties of the Department of Public Works shall include, but not be limited to:
 - ~~1.~~ 1. Permit Review. The department of public works shall:
 - ~~1-a.~~ 1-a. Review all development permits to determine that the permit requirements of this title have been satisfied;
 - ~~2-b.~~ 2-b. Review all development permits to determine that all necessary permits have been obtained from those federal, state or local governmental agencies from which prior approval is required;
 - ~~3-c.~~ 3-c. Review all development permits to determine if the proposed development adversely affects the flood-carrying capacity of the area of special flood hazard. For purposes of this chapter, "adversely affects" means that the cumulative effect of the proposed development, when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood more than one foot at any point.

Comment [CES1]: I REALLY don't want to amend Title 17 if you can help it. It would open up a whole new can of worms, require review by the Flood Advisory Board, and require a separate hearing/process.

Comment [RE2]: Yes no changes to Title 17 language moved to 16.16.400. Travis was concerned the last time this title was updated there was a large concern with the Advisory Committee

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~~B.2.~~ Use of Other Base Flood Data. When base flood elevation data has not been provided in accordance with WCC [17.04.050](#), Basis for establishing the areas of special flood hazard, the department of public works shall obtain, review, and reasonably utilize any base flood elevation and floodway data available from a federal, state or other source, in order to administer WCC [17.16.070](#), Specific standards, and 17.16.120, Floodways.

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~~C.3.~~ Information to be Obtained and Maintained. The department of public works shall:

~~1.a.~~ When base flood elevation data is provided through the flood insurance study or required as in WCC [17.12.030B](#), obtain and record the actual elevation (in relation to mean sea level) of the lowest habitable floor (including basement) of all new or substantially improved structures;

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~~2.b.~~ For all new or substantially improved floodproofed structures:

~~a.1)~~ Verify and record the actual elevation (in relation to mean sea level), and

~~b.2)~~ Maintain the floodproofing certifications required in WCC [17.12.010A](#);

~~3.3)~~ Maintain for public inspection all records pertaining to the provisions of this title.

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~~D.4.~~ Alteration of Watercourse. The department of buildings and codes administration shall:

~~1.a.~~ Notify adjacent communities and the Washington State Department of Ecology prior to any alteration or relocation of a watercourse, and submit evidence of such notification to the Federal Insurance Administration;

~~2.b.~~ Require that maintenance is provided within the altered or relocated portion of said watercourse so that the flood carrying capacity is not diminished.

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~~E.5.~~ Interpretation of FIRM Boundaries. The department of public works shall make interpretations where needed, as to the exact location of the boundaries of the areas of special flood hazards (for example, where there appears to be a conflict between a mapped boundary and actual field conditions). The person contesting the location of the boundary shall be given a reasonable opportunity to appeal the interpretation as provided in WCC [17.12.040](#).

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~~6.~~ Required Submission of Additional Information. The administrator shall have authority to require the applicant to submit information certified by licensed professional land surveyors, architects or engineers as may be reasonably necessary to assure conformance with the standards of this title.

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~~B. The duties of the Department of Planning and Community Service shall include, but not be limited to:~~

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~~1. Review all development permits to determine if requirements for protection of endangered species and critical habitat in this title or title 16.16 Critical Areas have been satisfied.~~

~~2. Provide assistance to Department of Public Works in determining suitable bioengineering measures or other methods of biomimicry for flood reduction.~~

17.13. Provisions for Habitat Protection

~~Before development or redevelopment activities identified in Title 16.16 Appendix XX are permitted within the floodplain or in all areas defined by FEMA as Protected Areas, listed in 16.16 Appendix XX, compliance with title 16.16.400 Critical Areas and FEMA National Flood Insurance Program (NFIP) protection standards for critical habitats for listed species shall be demonstrated through submittal of a habitat plan prepared by a qualified wildlife biologist. The plan shall identify any federally listed species and associated habitats and demonstrate that no harm will occur to such species or habitats as a result of development within the floodplain. To reduce duplicative reports a single critical area report may be submitted by the applicant to satisfy requirements of this title and title 16.16. Critical Areas~~

Comment [CES3]: Not sure where this would go yet, as there is no chapter 17.13

Title 16 Critical Areas

ARTICLE 4. Frequently Flooded Areas

16.16.400 Purpose.

The purposes of this article are to:

- A. Reduce the risk to life and safety, public facilities, and public and private property that result from floods.
- B. Avoid and minimize impacts to fish and wildlife habitats that occur within frequently flooded areas.
- C. Protect and maintain the beneficial ecological functions of frequently flooded areas, including providing the necessary flow regime to form and maintain a full range of functional and accessible salmonid habitats both within and outside of frequently flooded areas.
- D. In conjunction with the provisions of WCC Title [17](#), establish review procedures that provide an integrated approach to managing floodplain development and maintaining the capacity of the floodplain or floodway to convey and store flood waters. (Ord. 2005-068 § 1).

16.16.410 Designation and mapping – Frequently flooded areas.

- A. Frequently flooded areas are areas located along major rivers, streams, and coastal areas where the depth, velocity, intensity and frequency of flood water during major events present a risk to human life and property. Areas susceptible to these types of hazards are hereby designated as frequently flooded areas and subject to the provisions of this article.
- B. The approximate location and extent of frequently flooded areas are shown on the county's critical area maps. These maps are to be used as a guide and do not provide a definitive critical area designation. The county shall update the maps as new hazard areas are identified and as new information becomes available. This article does not imply that land outside mapped frequently flooded areas or uses permitted within such areas will be free from flooding or flood damages. This chapter shall not create liability on the part of Whatcom County, any officer or employee thereof, or the Federal Insurance and Mitigation Administration (FIMA), for any flood damages that result from reliance on this chapter or any administrative decision lawfully made hereunder.
- C. Frequently flooded areas shall include, but not be limited to:
 - 1. Areas subject to a one percent recurrence interval of flood water inundation or a 100-year base flood as mapped on the current effective Federal Emergency Management Agency's Flood Insurance Rate Maps (FIRM). This includes coastal high hazard areas as defined by this chapter and as identified and designated on the FIRM maps as Zone VE or V; provided, that tsunami hazard areas are designated as geologically hazardous areas and subject to the provisions of Article 3 of this chapter.
 - 2. Other flood hazard areas identified by the county public works department based on review of historical data, high water marks, photographs of past flooding, or similar information from federal, state, county, or other valid sources when base flood

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elevation data from the Federal Insurance and Mitigation Administration has not been provided or is not accurate.

~~2.3. Protected Areas as defined by Appendix XX.~~

16.16.420 Frequently flooded areas – General standards.

A. All development shall conform to the provisions of WCC Title 17, Flood Damage Prevention, and the applicable provisions of this chapter.

B. Development within frequently flooded areas shall be allowed pursuant to:

Standards in Appendix XX Minimum Criteria

1. ~~Before development or redevelopment activities identified are permitted within the floodplain compliance with FEMA National Flood Insurance Program (NFIP) protection standards for critical habitats for listed species shall be demonstrated through submittal of a habitat plan-habitat assessment and if necessary mitigation plan prepared by a qualified professional in accordance with the FEMA Regional Guidance for the Puget Sound Basin. The plan shall identify any federally listed species and associated habitats, and demonstrate that no harm will occur to such species or habitats as a result of development within the floodplain frequently flooded areas.~~

~~1.2. The mitigation sequence in WCC 16.16.260. In addition to the applicable general protective measures found in WWC 16.16.265, the technical administrator shall have the authority to require mitigation for adverse impacts to floodplain ecological functions; provided, that such mitigation shall be consistent and compatible with the goal of protecting health and safety and minimizing risks to property.~~

16.16.430 Review and report requirements.

A. When County critical area maps or other sources of credible information indicate that a site proposed for development is or may be located within a frequently flooded area, the County Public Works Department River and Flood Division and/or the technical administrator shall have the authority to require a critical area assessment report.

B. The ~~technical administrator for the~~ Public Works Department shall have primary responsibility for reviewing and approving proposed developments ~~under the standards in Title 17 and ; provided, that the technical administrator shall review proposals for development or redevelopment in a floodplain development proposals~~ for consistency with the standards provided in this chapter ~~and Title section XXX Provisions for, may place conditions for approval and/or require mitigation in accordance with this chapter. If mitigation is required, then the Public Works technical administrator may defer to other critical areas technical staff for review of mitigation requirements.~~

Critical areas assessment reports for frequently flooded areas shall meet:

1. ~~The~~ requirements of WCC 17.12.010 and 16.16.255. The technical administrator shall have the authority to modify these requirements when he/she determines that any portion of these requirements is unnecessary given the scope and/or scale of the proposed development.

2. The critical area assessment will address the following:

i. Direct and indirect adverse impacts to ecological functions and processes, including riparian vegetation. Positive impacts may also be discussed.

Comment [CES4]: To which appendix does this refer?

Comment [RE5]: Do not add reference to Appendix. Travis was concerned with FEMA Appendix A direct reference.

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Comment [CES6]: New appendix proposed by Ryan.

Comment [RE7]: We longer need Appendix A reference

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Comment [RE8]: Add to implement 16.16.400(B)

Comment [CES9]: Does the DPW have a TA? The use of TA throughout the CAO always refers to the PDS TA.

Comment [RE10]: Added to implement existing purpose 16.16.400 B,C, and D (coordinated review).

Comment [CES11]: Ditto.

Comment [RE12]: For review in 16.16; mitigation requirements for protection habitat and ecological functions would be from the technical administrator of the CAO. The existing purpose statements indicates this CAO chapter is to protect ecological functions, fish and wildlife habitat and integrated review of CAO and Title 17.

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~~2. The requirements in Appendix XX Minimum Criteria for review of floodplain functions.~~

ii. The technical administrator also shall have the authority to require ~~additional~~ information that discloses and describes the effects of proposed development on floodplain functions, including, but not limited to: storing and conveying flood water; ~~channel migration~~, reducing peak flows and flow velocities; reducing redd scour and displacing rearing juvenile fish; maintaining sediment quality in streams; reducing shear stress and bank erosion; improving water quality; providing wildlife habitat; maintaining fish access; and cycling nutrients or providing other hyporheic functions that link surface and ground water systems.

~~FEMA Biological Opinion Appendix 4 Minimum Criteria (as amended)~~

~~1-iii.~~ The reports shall also include mitigation for adverse effects on floodplain ecological functions ~~where applicable.~~

B. Critical areas assessment report requirements may be waived for ~~single family~~ developments ~~and structures accessory to agricultural uses outside of the Protected Areas~~ when the ~~critical areas~~ technical administrator and the public works department determines that no adverse impacts or risks to life, property, or ecological functions will occur.

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Comment [TB13]: Requires us to adopt larger buffers, would strike this for now, other communities when going to Door #2 approval have had smaller buffers approved if scientific evidence is provided.

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Comment [TB14]: Sometimes you cannot mitigate for adverse effects (protected area, etc). In other words, a redesign maybe required instead of mitigation. Not sure how to wordsmith this??

Comment [TB15]: This is good but in addition sometimes we accept an "abbreviated" assessment for ESA compliance, depending on the development and/or pre-existing conditions, etc.

Comment [EP16]: When would this situation ever occur? Can we delete this section C?

Comment [RE17]: I would concur (1). Above allows the report to be reduced in scope depending on the proposed development

Article 6. Fish and Wildlife Habitat Conservation Areas

16.16.710 Designation, mapping and classification – Habitat conservation areas.

- C. For purposes of this chapter, habitat conservation areas shall include all of the following:
10. Locally important species and habitats that have recreational, cultural, and/or economic value to citizens of Whatcom County, including the following:
 - b. Habitats.

- ~~— Floodplain Riparian Zone is an overlay area that encompasses lands as defined below on either side of all streams associated with a floodplain and/or marine shorelines.~~
- ~~— 250 feet measured perpendicularly from ordinary high water for Type S (Shorelines of the State) streams; excluding marine shorelines~~
- ~~— 200 feet for Type F streams (fish bearing) greater than 5 feet wide and Type S 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:

 - ~~— Stable slopes 150 foot~~
 - ~~— Unstable slopes 225 foot~~~~
- ~~— the Channel Migration Zone plus 50 feet; and~~
- ~~— the mapped Floodway.~~

11. Frequently Flooded Areas

16.16.740 Standards – Habitat Conservation Area Buffers

- C. Buffers for Other Habitat Conservation Areas. The technical administrator shall determine appropriate buffer widths for other habitat conservation areas based on the best available information. Buffer widths for non-stream habitat conservation areas shall be as shown in Table 1.

Table 1. Buffer Requirements for HCAs

| Habitat Conservation Area | Buffer Requirement |
|--|---|
| Areas with which federally listed species have a primary association | Buffers shall be based on recommendations provided by the Washington State Department of Fish and Wildlife PHS Program; provided, that local and site-specific factors shall be taken into consideration and the buffer width based on the best available information concerning the species/habitat(s) in question and/or the opinions and recommendations of a qualified professional with appropriate expertise. |
| State priority habitats and areas with which priority species have a primary association | |
| Commercial and recreational shellfish areas | Buffers shall extend 150 feet landward from ordinary high water mark of the marine shore. Buffers shall not be required adjacent to shellfish protection districts, but only in nearshore areas where shellfish reside. |
| Kelp and eelgrass beds | Buffers shall extend 150 feet landward from ordinary high water mark of the marine shore. |
| Surf smelt, Pacific herring, and Pacific sand lance spawning areas | Buffers shall extend 150 feet landward from ordinary high water mark of the marine shore. |

Comment [ELP18]: Fish bearing streams are regulated differently than DNR "Type F" streams. We don't use DNR typing at WC. Is this compatible throughout section 11 here? Do we adopt these definitions in 16.16.740(B)?

Comment [RE19]: I believe the TAC recommend using the interim stream typing? All state guidance uses this system

Comment [ELP20]: Need to define slope degree and stable vs. unstable, or defer to GEO code or administrator

Comment [ELP21]: Adopt CMZ maps?

Comment [ELP22]: Per Whatcom County Maps? FEMA maps?

Comment [TB23]: Delete above and add this to the list.

| Habitat Conservation Area | Buffer Requirement |
|--|--|
| Natural ponds and lakes | Ponds under 20 acres – buffers shall extend 50 feet from the ordinary high water mark; lakes 20 acres and larger – buffers shall extend 100 feet from the ordinary high water mark; provided, that where vegetated wetlands are associated with the shoreline, the buffer shall be based on the wetland buffer requirements in WCC 16.16.630 . |
| Natural area preserves and natural resource conservation areas | Buffers shall not be required adjacent to these areas. These areas are assumed to encompass the land required for species preservation. |
| Locally important habitat areas | <p>The buffer for marine nearshore habitats shall extend landward 150 feet from the ordinary high water mark.</p> <p>The need for and dimensions of buffers for other locally important species or habitats shall be determined on a case-by-case basis, according to the needs of the specific species or habitat area of concern. Buffers shall not be required adjacent to the Chuckanut wildlife corridor. The technical administrator shall coordinate with the Washington State Department of Fish and Wildlife and other state, federal or tribal experts in these instances, and may use WDFW PHS management recommendations when available.</p> |
| Floodplain Riparian Zone Frequently Flooded Areas | Buffers shall not be required adjacent to these areas. These areas are assumed to encompass the land required for protection. |

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:

11. **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: Model Washington NFIP-ESA Ordinance D – 8 April 2011
 - 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); *[updated per the May 14, 2009, errata letter]*
 - the Channel Migration Zone¹ 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.² Uses that are not permitted unless shown not to adversely affect water quality, water quantity, flood volumes, flood

¹ 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.]

² 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

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 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

12. 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 adverse effects to floodwater storage and fish habitat function within the 100-year floodplain. *[updated per the May 14, 2009, errata letter]*

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 adverse 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. *[updated per the May 14, 2009, errata letter]*

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).

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.] Model Washington NFIP-ESA Ordinance D—9 April 2011

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 Shellberg, 2001 for hyporheic zone issues). Model Washington NFIP-ESA Ordinance D— 10 April 2011

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 stem wall 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 surfaces² shall not exceed 10 percent of the surface area of the portion of the lot in the floodplain unless mitigation is provided.

² Any material or land alteration (i.e. clearing, grading, etc.) that reduces or prevents absorption of stormwater 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.]

- 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). Model Washington NFIP-ESA Ordinance D – 11 April 2011
- 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).

Comment [TB24]: Remove this for now, will address when and if we are directed to go to Door #2.

Jessi Roberts

From: Travis Bouma
Sent: Monday, June 29, 2015 2:16 PM
To: Ryan Ericson; Cliff Strong
Cc: Amy Dearborn; Erin Page; Wayne Fitch
Subject: RE: FEMA Updated Recommendations
Attachments: Proposed FEMA BiOp Integration Recommendations - REricson w EPage CStrong edits TB.docx

See attached for my comments/edits... Would like to discuss with the group though prior to proceeding with anything.

Thanks,



Travis E. Bouma, Engineering Technician | CFM
Public Works Department | River & Flood Division
322 N. Commercial St., Suite 120 | Bellingham, WA 98225
360-676-6876 x50688 | tbouma@co.whatcom.wa.us

From: Ryan Ericson [<mailto:Ryan@futurewise.org>]
Sent: Thursday, June 25, 2015 11:46 AM
To: Cliff Strong; Travis Bouma
Cc: Amy Dearborn; Erin Page; Wayne Fitch
Subject: RE: FEMA Updated Recommendations

Thank you Cliff. I forgot to cc you on the last email with changes to 16.16.400 and removed all title 17 changes as Travis suggested. I have attached the email and a document with my additional comments and proposed edits.

Ryan

From: Cliff Strong [<mailto:CStrong@co.whatcom.wa.us>]
Sent: Thursday, June 25, 2015 10:56 AM
To: Ryan Ericson; Travis Bouma
Cc: Amy Dearborn; Erin Page; Wayne Fitch
Subject: RE: FEMA Updated Recommendations

Ryan, I've taken your recommendations (deleting the sections where no changes were proposed) and added Amy's and Erin's comments and edits, and included some of my own as well. Please review.

Travis, I'd like to know your opinion as well.

I think Erin's trying to get us together again. I'd certainly like to get this before the TAC soon, perhaps at their next meeting (7/8, for which I'd need a product next Thursday at the latest). We're at the tail end of things, so time is of the essence.

Thanks,

Cliff Strong

Senior Planner
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From: Amy Dearborn
Sent: Wednesday, June 24, 2015 4:10 PM
To: Cliff Strong
Subject: FW: FEMA Updated Recommendations

From: Ryan Ericson [<mailto:Ryan@futurewise.org>]
Sent: Wednesday, June 24, 2015 1:01 PM
To: Wayne Fitch; Amy Dearborn; Erin Page; Travis Bouma
Subject: FEMA Updated Recommendations

We need to setup another meeting, for later this week.

Attached is the document with changes made to 16.16 only. Giving endangered species review authority in Frequently Flood areas to technical administrator and provide Floodplain Riparian Zone as a fish and wildlife conservation area. The CAO already had language in the purpose of Frequently Flooded Section to protect fish and wildlife, added review language for the technical administrator. New FWHCA of Floodplain Riparian Zone, this is intended to be an overlay for managing a no net loss of vegetation and not a reduction of uses allowed in FWHCA uses allowed in and outside of stream buffers applies.

Option 2. – Put all the language in 16.16.700 as its own section. Easy to do.

Mitigation Area Ratios for Riparian Buffers

I have reviewed a number of State Agency documents from Washington, California, Oregon, Maryland, Minnesota, and Pennsylvania. Each document reviewed recommended an equal replacement area of 1:1. Number of plants per area (Spacing and Density) did differ.

Plant Spacing and Density – Outside of wetland papers I found very few empirical studies on replacement ratios of Riparian Vegetation, some papers addressed wetland and riparian plant density together; State agencies provided different guidance ranging from at least 60% canopy coverage to elaborate formulas. Examples:

- Suggested density for seedling was 200 to 400, one agency suggested a mature density of 300 trees per acre. (10x10 tree spacing is about 436, 8x8 = 681)
- Department of Ecology study from 2002 found in areas with planting plans designed to achieve rapid canopy coverage a good ratio is 4 tree species to 6 species of shrubs or 1:1.5, which could be rounded up to 1:2.
- Tukwila has a maximum of 70 trees per acre, and uses a similar strategy as WSDOT
- WSDOT has a decent strategy which is standardized by diameter of tree

Minimize loss of tree canopy cover, as measured by aerial cover using air photos and current urban forestry methodology.

a. Avoid impacts where feasible. When a project cannot be constructed without removing trees, restore within the disturbed roadside areas of the project according to the following guidelines:

Category 3: Small coniferous and other late successional species trees less than 4 inches in diameter, measured 6 inches from the ground, and all shrubs:

- Replace disturbed functions.
- Consider a 1:1 ratio using a mix of trees and shrubs.
- Use best management practices (BMPs) for restoration of the disturbed areas (see the *Highway Runoff Manual*, Chapter 5).

Category 2: Moderate-size coniferous and other late successional species trees between 4 and 30 inches in diameter, measured 4.5 feet from the ground:

- Replace at a ratio of one 1-gallon replacement tree for each 1-inch of trunk diameter.
 - If larger container sizes are used, the plant quantity will be adjusted down. For example, if 2-gallon container plants are used, only half the number of plants will be required.
- Use BMPs for restoration within the disturbed roadside areas of the project (see the *Highway Runoff Manual*, Chapter 5).

Category 1: Mature, old-growth, large specimen, or heritage trees greater than 30 inches in diameter, measured at 4.5 feet from the ground:

- Consult with the HQ Design Landscape Architect to determine appropriate project-specific restoration.
- Environmental benefits of the project can balance impacts to individual trees, such as those resulting from fish passage improvement projects.

RECOMMENDATION:

I would suggest we use a hybrid of WSDOT and current mitigation practices. For a mixed story planting using the ratio of 1 tree per 2 shrubs. Also Travis and I agree to meet conditions of no net loss of Riparian Functions within the floodplain, if a site is heavily disturbed, consisting of manicure lawn, ornamentals, noxious/invasive species. That the applicant could offset permanently lost vegetation with an area ratio of 0.5 to 1. This would require the planting to occur which would provide the greatest benefit and when available contiguous with existing Riparian Vegetation.

FEMA ESA Review Checklist

Reviewer: _____

Project: _____

Date: _____

Project Area Description:

- Location information: Address, Parcel number, TSR, Lat/Long.
- Water Resources: Watershed, WRIA, affected water bodies, water Type, Shoreline Designation
- Location relative to Critical Areas / Buffers (wetlands, streams, kelp, eelgrass, forage fish, HCAs)

Notes:

Project Area Map:

- Property boundary
- Topography
- Water bodies / Critical Areas, Buffers
- Flood depths / velocities (?), flow paths
- Existing structures and vegetation
- Final build out footprint including grading

Notes:

Environmental Baseline:

- Background Research: Documents, websites, USFWS/ NMFS lists, DNR Plants, Local Experts
- ESA species lists
- Describe and map Action Area
- Describe listed and EFH Species and Critical Habitat presence, timing, and PCEs.
- Describe why some excluded - rationale
- Site Characterization: Detailed description of site and habitat conditions on and adj. to site.
 - a. Soils (infiltration, disturbance level), topography, plants, existing drainage, shoreforms, wetlands, buffers, etc.

Notes:

Habitat Narrative:

- Identify and describe the presence and quality of natural features as they relate to PCEs.
- Water Quality assessment: 303D listing of receiving waters.
- Water Quantity assessment: Describe site flood and low flow hydrology (flow paths, depths, volumes, velocities, frequency; constructed drainages, stormwater outfalls, etc.).
- Describe vegetation communities and habitat structures.
- Describe spawning habitat quality, quantity, distribution for TES fish and forage fish.
- Describe flood Refugia quality, quantity, and distribution.
- Habitat Area Map: Map at same scale as Project Area Map showing areas of primary association, spawning areas.

Notes:

Project Description:**Final Project:**

- Project Summary
- Describe all structures present at final build out.
- Describe nature and size of all impervious surfaces.
- Describe nature and size of all ground disturbance.
- Describe waste water disposal
- Describe Permanent Stormwater Treatment facilities
- Describe Non-native landscaping
- Describe on-going activities that could affect habitat (ie fertilizer)

Construction Process

- Construction time line
- In-water work description
- Construction stormwater management
- Methods , timing , phasing of construction (buildings, paved areas, shoreline modifications, mitigation)

Notes:

Protective Measures:

- TESC Plan
- Permanent Stormwater Plan
- LID Measures

Notes:

Impact Assessment:

- Likelihood of impact based on proximity and timing, Distribution of impacts
- Effect on lifecycle, population size, variability, distribution or PCEs of critical Habitat.
- Duration: Short term, long-term seen after completion, or permanent change that re-sets threshold of population or critical habitat.
- Frequency of impacts compared to recovery rates.
- Severity of effects

Direct effects: (Happens immediately)

- Timing, and size of effects, species tolerances, severity of take,
- Quantity and quality of expected habitat loss

Indirect Effects: (Happens later)

- Describe timing and size of indirect impacts (ie. Stormwater, long term siltation, adj. veg clearing, hydro alterations)
- State Effects determination

Notes

Mitigation:

- Describe sequencing: avoid, minimize, restore, compensate. How do these make impacts discountable or insignificant?
- Alternatives analysis
- Description of objectives and how plan meets them.
- Maps

Notes: