memorandum

date June 23, 2017

to Aaron Nix, City of Edgewood

from Adam Merrill and Christina Hersum

subject Critical Areas Ordinance Update - Gap Analysis and Best Available Science Consistency Review

The City of Edgewood (City) is in the process of updating its Critical Areas Ordinance (CAO) (Edgewood Municipal Code [EMC] Title 14) in accordance with the requirements of the Growth Management Act (GMA) (RCW 36.70A). ESA is pleased to be assisting the City with that process. The GMA requires cities to consider best available science (BAS) in the development of critical areas policies and regulations.

ESA reviewed the City's CAO for consistency with the current scientific literature and applicable agency guidance now available. Associated Earth Sciences, Inc. (AESI) reviewed the Geologically Hazardous Areas regulations (EMC Chapters 14.60, 14.80, 14.90, and 14.110) as a subconsultant to ESA.

In general, the latest documents in the record pertaining to critical areas have been prepared by state agencies in Washington as guidance to local governments. The ESA team also reviewed recently updated critical area codes from other neighboring jurisdictions and recommended changes that would help the City achieve greater consistency with current standards and practices. Our recommendations also reflect our professional judgment and experience assisting numerous cities and counties with code interpretation and administration.

Gap Analysis and Consistency Review Methods

ESA and AESI conducted a review of the current CAO sections for the purposes of identifying areas of inconsistency with agency guidance and best available science. To organize our review and recommendations, we developed a matrix (attached to this memo) documenting consistency between CAO provisions and GMA regulations, relevant agency guidance and best available science published since 2017. The gap analysis matrix provides an assessment of general consistency, a suggested or recommended change to the CAO, and the corresponding rationale and source for each recommendation. When the matrix states that the CAO is “inconsistent with BAS” or “inconsistent with GMA”, this means that the code provision does not, in our opinion, meet or is not supported by best available science or state agency guidance. When the matrix states that the CAO is “could be revised to be more consistent,” this means that portion(s) of the code provision are supported by best available science or state agency guidance, but could be strengthened to be fully compliant.
We also provide recommendations that are better described as changes to “improve clarity” or “improve ease-of-use;” these address provisions that could be confusing or difficult to administer due to a lack of clarity or readability.

**Overall Code Structure and Content**

In general, the Edgewood CAO is reasonably clear and has a comparable structure with state guidelines. However, as detailed in the attached matrix, several of the code provisions need to be updated to improve their consistency with BAS and current agency guidelines. Additionally, to improve ease-of-use and simplify the administration of the CAO, we recommend removing and/or consolidating many of the code section in the CAO. We understand that the existing CAO was adapted from the version of the Pierce County CAO that was in affect at the time the City was incorporated (1996), and contains code provisions may not be applicable to the City or its more limited land uses.

**Updates to Scientific Literature**

The following sections summarize new scientific literature and regional policy concerning critical areas protection and management and are intended to inform the specific recommendations for code updates in the attached matrix.

**Wetlands**

Wetlands are specifically identified for protection as a critical area by the GMA (WAC 365-190-080[3]). The current CAO provides standards for protection of wetlands in EMC Chapter 14.30. In general, the latest documents in the record pertaining to wetlands have been prepared by state and federal agencies. Since the City’s last major CAO update, new scientific findings have been published describing methods for assessing wetland functions on a watershed-based and landscape-scale, alternative mitigation strategies (mitigation banking and in-lieu fee programs), improving the success of compensatory mitigation, and buffer effectiveness. For example, the Washington Department of Ecology (Ecology) and Washington Department of Fish and Wildlife (WDFW) released a two-volume BAS document in 2005 that is still the primary source of information for wetland management: *Wetlands in Washington State – Vol. 1 A Synthesis of the Science* (Sheldon et al. 2005) and *Vol. 2 Guidance for Protecting and Managing Wetlands* (Granger et al. 2005).

**Wetland Model Code:** The wetland model code found in the *Critical Areas Assistance Handbook: Protecting Critical Areas Within the Framework of the Washington Growth Management Act* (CTED, 2007) was updated in 2016 and can be found in *Wetlands and CAO Updates: Guidance for Small Cities, Western Washington Version* (Bunten et al., 2016). This model code offers example language recommended by Ecology that reflects many of the updates suggested in this section.

**Wetland Delineation and Rating:** In 2010, the U.S. Army Corps of Engineers released the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coasts* (Corps, 2010). The regional supplement updates portions of the 1987 Corps’ Wetland Delineation Manual and provides additional technical guidance and updated procedures for identifying and delineating wetlands. State law requiring the *Washington State Wetlands Identification and Delineation Manual* (Ecology, 1997) was repealed in 2011, and the state manual is no longer required or supported by Ecology. The Regional Supplement is now required by state law (WAC 173-22-035).
Ecology released an update to their wetland rating system, the *Washington State Wetland Rating System for Western Washington: 2014 Update* (Hruby, 2014), that went into effect January 2015. Most of the material in the 2014 updated manual remains the same as that in the 2004 manual. The updated wetland rating manual includes a new scoring range (i.e., between 9 and 27 under the updated manual versus 1 to 100 in the 2004 manual) that is based on a qualitative scale of functions from high, medium, or low. The new approach to scoring wetland functions on a high, medium, or low scale is considered by Ecology to be an improvement over the old rating system (Hruby, 2014). The 2014 updated manual also includes new sections for assessing a wetland’s potential to provide functions and values on a landscape-scale.

**Alternative Mitigation**: One of the most significant changes in BAS since Edgewood’s last code update involves alternative mitigation strategies. According to the National Research Council, compensatory mitigation implemented in the past, particularly on-site mitigation installed by the permittee, has frequently been unsuccessful and has not achieved the national policy of “no net loss” of wetland area and functions (NRC, 2001). Traditionally, permit applicants have constructed mitigation projects on the development site to compensate for effects to aquatic resources (e.g., wetlands, streams) with limited oversight and enforcement of mitigation requirements. This type of mitigation is referred to as “permittee-responsible” mitigation. Additionally, alternative forms of mitigation, such as mitigation banks and in-lieu fee (ILF) programs, and advance mitigation were not established uniformly across the country, or within individual states, and there were numerous cases where alternative mitigation programs were operated unsuccessfully.

To address these mitigation deficiencies, in early 2008 the US Army Corps of Engineers (Corps) and Environmental Protection Agency (EPA) released revised regulations governing compensatory mitigation for authorized impacts to waters of the US, including wetlands. The Federal Rule, formally known as the Compensatory Mitigation for losses of Aquatic Resources; Final Rule, lays out criteria and performance standards designed to improve the success and quality of mitigation activities (Corps, 2008).

The Federal Rule emphasizes a watershed approach to mitigation as part of the planning, implementation, and management of mitigation projects. A watershed approach is an analytical process for making compensatory mitigation decisions that support the sustainability or improvement of aquatic resources in a watershed; it involves consideration of watershed needs, and how locations and types of compensatory mitigation projects address those needs.

Alternatives to permittee-responsible mitigation are increasingly implemented within Washington State and around the country to compensate for authorized effects to aquatic resources. Common forms of alternative mitigation include:

- **Mitigation Banks**—restoring, establishing, enhancing, and/or preserving aquatic resources through funds paid to a public or private Sponsor to satisfy compensatory mitigation requirements for Corps permits. At banks, the Sponsor has already secured a mitigation site and initiated mitigation activities before fees are accepted. Typically, mitigation banks exist at one location and the Corps does not have authority over bank expenditures.

- **In-Lieu Fee (ILF) Programs**—restoring, establishing, enhancing, and/or preserving aquatic resources through funds paid to a governmental or non-profit natural resources management entity to satisfy compensatory mitigation requirements for Corps permits. In-lieu fee programs accept mitigation fees before securing and implementing projects. These programs implement mitigation at multiple sites as funds become available and after the Corps approves project funding.
• **Consolidated Off-site Mitigation**—restoring, establishing, enhancing, and/or preserving aquatic resources through funds paid to a public or private entity Sponsor. Mitigation typically occurs at a single location in a phased approach; as compensatory mitigation fees are paid to the public or private entity by permit applicants, portions of the mitigation site are constructed.

• **Advance Mitigation**—restoring, establishing, enhancing, and/or preserving of aquatic resources, undertaken by public or private permit applicants in advance of permitted impacts. This type of mitigation is considered permittee-responsible compensatory mitigation because only the permit applicant who implements the advance mitigation may use it to satisfy their compensatory mitigation obligations.

In the Federal Rule, the Corps outlined a mitigation hierarchy, preferring mitigation banks over ILF programs and ILF programs over permittee-responsible mitigation.

Alternative forms of mitigation do not change the requirements for permit applicants to adhere to “mitigation sequencing” required by regulatory agencies. These are step-wise requirements under federal and state laws that require permit applicants to demonstrate that, first, avoidance and minimization measures have been taken before the remaining aquatic resource effects are determined unavoidable. Avoidance and minimization measures occur during project design and are intended to avoid and reduce a project’s effects prior to construction. Once a determination is made that project effects are unavoidable, compensatory mitigation is required.

**Compensatory Mitigation:** Where compensatory mitigation (permittee-responsible) is the best option for mitigating wetland impacts, recent guidance has been developed to improve mitigation success. Ecology, in coordination with the U.S. Army Corps of Engineers (Corps) and the U.S. Environmental Protection Agency (EPA), developed a two-part guidance document intended to improve the quality, consistency, and effectiveness of compensatory mitigation in Washington State.

Part 1 of the document, *Wetland Mitigation in Washington State—Part 1: Agency Policies and Guidance* (Ecology Publication #06-06-011a, March 2006a), provides regulatory background and outlines information that regulatory agencies use. Some of this information has been superseded by recent guidance discussed in the Alternative Mitigation section; however, wetland mitigation ratios listed in this document are the basis for many local jurisdictions’ mitigation requirements. Part 2 of the document, *Wetland Mitigation in Washington State—Part 2: Developing Mitigation Plans* (Ecology Publication #06-06-011b, March 2006b) provides specific technical guidance on developing a compensatory wetland mitigation plan.

As an alternative to using mitigation ratios, the Ecology developed *Calculating Credits and Debits for Compensatory Mitigation in Wetlands of Western Washington* (Hruby, 2012) for estimating whether a project’s compensatory mitigation plan adequately replaces lost wetland functions and values. Termed the “Credit-Debit Method,” this manual describes a functions-based approach to determine wetland functions lost during project development (i.e., “Debits”) compared to functions gained at a mitigation site (i.e., “Credits”). A mitigation project is considered successful when the “credit” score for a compensatory mitigation project is higher than the “debit” score. Based on our local experience, the Corps and Ecology are starting to rely on the Credit-Debit Method instead of mitigation ratios alone.

**Buffer Effectiveness:** In 2005, Ecology summarized the literature related to wetland buffers and buffer effectiveness (Sheldon et al, 2005). In 2013, the Department of Ecology updated this document with a literature

The updated buffer paper confirmed that buffers perform an important water quality function by trapping pollutants before they reach a wetland. Generally, the wider the buffer, the more effective it may be at protecting water quality; however, recent research reveals that several other factors contribute to the effectiveness of water quality functions (e.g., slope, type of vegetation, surface roughness, soil properties, type and concentration of pollutants, etc.). Specifying only the width of a buffer as a means for protecting water quality functions can be complicated and may not address these other factors (Hruby, 2013). With respect to protecting habitat quality, research in the past decade reveals that larger buffers are needed to protect wetland-dependent species, which may require larger areas of relatively undisturbed uplands for survival (Hruby, 2013).

Ecology’s recommended buffers in the model wetlands code (Table “XX.1”) outlines a combined fixed-width and variable-width approach to wetland buffers, with a minimum buffer prescribed based on a wetland’s category and an additional buffer based on increasing habitat points (Bunten et al., 2016). In developing communities, such as Edgewood, standard buffer widths may be difficult to achieve. For reductions to a standard buffer width, an applicant should demonstrate that a smaller buffer will protect wetland functions and values, with additional mitigation measures applied where needed to support “no net loss” of those functions and values (Granger et al., 2005). Ecology’s model code (Table XX.2) outlines required mitigation measures that can be used to protect wetlands (Bunten et al., 2016). The model code recommends that standard buffers should not be reduced below 25 percent of the standard buffer with (Bunten et al., 2016).

Streams, and Fish and Wildlife Priority Habitats

Fish and wildlife habitat conservation areas (FWHCA) are specifically identified for protection as a critical area by the Growth Management Act (WAC 365-190-080[3]). The current CAO provides standards for protection of streams (included in the GMA as a FWHCA) in EMC Chapter 14.40.

The latest documents in the record pertaining to fish and wildlife habitat conservation areas have been prepared predominantly by state, federal, and tribal agencies. Much of this science is related to protecting salmon and fisheries habitat. For example, in 2009, the Washington Department of Fish and Wildlife (WDFW) published Land Use Planning for Salmon, Steelhead and Trout: A Land Use Planner’s Guide to Salmonid Habitat Protection and Recovery as part of an initiative to integrate local planning programs with salmon recovery efforts (Knight, 2009). Other documents are related to managing biodiversity and habitat quality with urban development. In 2009, WDFW also published Landscape Planning for Washington’s Wildlife: Managing for Biodiversity in Developing Areas, which provides guidance for wildlife issues related to rural and urban residential development.

Fish and Wildlife Habitat Conservation Areas Model Code: The model code found in the Critical Areas Assistance Handbook: Protecting Critical Areas Within the Framework of the Washington Growth Management Act (CTED, 2007) is the most recent state recommendations related to fish and wildlife habitat conservation areas; however, portions of Wetlands and CAO Updates: Guidance for Small Cities, Western Washington Version (Bunten et al., 2016) are applicable or were referenced for code consistency.

Buffer Effectiveness: When discussing BAS for buffers and buffer effectiveness for fish and wildlife habitat conservation areas, one must distinguish between stream/riparian buffers (those areas providing functions
related to fish habitat and stream processes) and habitat buffers (areas including riparian buffers and the terrestrial areas adjacent to them which provide wildlife functions for a variety of species). Recommendations for stream buffers have remained relatively similar since the City’s last CAO update, with recommended buffer widths varying from 75 feet to over 300 feet to protect a suite of ecological functions (Brennan et al., 2009; May, 2003; Knutson and Naef, 1997).

Research indicates that uplands surrounding wetlands and streams can serve as critical habitat for some species, a concept that expands the notion of a buffer beyond simply protecting riparian functions to protecting aquatic-dependent species (Hruby, 2013; Semlitsch and Jensen, 2001). Research indicates that stream/riparian buffers alone will not be enough to protect certain species and that a broader approach to protecting wildlife is needed, especially in areas that are intensely developed (Hruby, 2013; Semlitsch and Jensen, 2001). These broader approaches may include establishing wildlife habitat corridors or other habitat connections.

Research related to general wildlife habitat connectivity, however, indicates that connectivity is important for species to travel and carry out life processes. Small mammals, amphibians, and reptiles are generally more sensitive to changes and gaps in connectivity compared to larger mammals and birds (WDFW, 2009). Areas with less than 50 percent undisturbed land cover (i.e., developed urban environments) need assistance to ensure that habitat connectivity is maintained (WDFW, 2009). In addition to using local critical areas inventory information and Priority Habitats and Species (PHS) data, WDFW recommends protecting large undeveloped habitat patches and open space areas as part of planning and building habitat corridors (WDFW, 2009).

In general, the standards related to wetland buffer reductions and averaging discussed earlier are deemed to be applicable to fish and wildlife habitat conservation area buffers, although specific requirements and protections may be required for local, state, and federally listed species.

**Frequently Flooded Areas**

Frequently flooded areas are specifically identified for protection as a critical area by GMA (WAC 365-190-110). The current CAO provides standards for regulating development within frequently flooded areas in EMC Chapter 14.70. These regulations were updated in March 2017.

The adopted flood hazard area regulations focus chiefly from the perspective of flood effects on human health, safety, and property, and the effects of human activities on flooding. Floodplains perform a variety of beneficial functions including providing for natural flood and erosion control, water quality maintenance, groundwater recharge, biological productivity, fish and wildlife habitat (Steiger et al. 2005), production and of wild and cultivated products, recreational opportunities, and areas for scientific study and outdoor recreation (Kusler 2011). Floodplains typically contain several major types of habitats including aquatic, riparian, wetland, and upland habitat.

Recent BAS and regional guidance for protection of ecological functions within a floodplain emphasizes the importance of other critical areas (including wetlands, streams, riparian areas, and FWHCAs) within floodplains, and emphasizes the importance of protection of these critical areas (PSP 2010; NMFS 2009; Ecology 2015). Guidance highlights the importance of other critical areas provisions in ensuring that floodplain ecological functions are protected into the future. Due to a 2009 Biological Opinion by the National Marine Fisheries Service (NMFS) regarding protection Endangered Species Act listed salmonid species from the effects of floodplain development activities, assessment of floodplain habitat impacts and new standards for protection are now required for NFIP participating communities (NMFS 2009; FEMA 2013).
Ecology has recently published Guidance to Local Governments on Frequently Flooded Areas Updates in CAO’s that addresses the key elements of updating the frequently flooded areas provisions in a CAO Update (Ecology 2015). The guidance addresses relevant information sources and approaches to incorporating the protection of ecological functions into the CAO. The City’s current frequently flooded areas code provisions were found to be generally consistent with this guidance.

**Geologically Hazardous Areas**

Geologically hazardous areas are specifically identified as a critical area by GMA (WAC 365-190-120). The current CAO provides standards for protection of safety of citizens from geologically hazards areas in EMC Chapters 14.60 (Volcanic Hazard Areas), 14.80 (Landslide Hazard Areas), 14.90 (Seismic [Earthquake] Hazard Areas), and 14.110 (Erosion Hazard Areas). BAS related to geologically hazardous areas, along with a summary review of existing regulations, is presented in the attached memo from AESI. Specific geologically hazardous area code update recommendations are included in the attached gap analysis matrix.

**Critical Aquifer Recharge Areas**

Critical aquifer recharge areas (CARAs) are specifically identified for protection as a critical area by GMA (WAC 365-190-100). The current CAO provides standards for protection of CARAs in Chapter 14.40. Two types of CARAs are identified within the City: 1) areas designated as “Vulnerable Aquifer Recharge Areas” as identified by Pierce County and 2) wellhead protection areas designated by the Mt. View-Edgewood Water Company.

The risk of ground water contamination depends on two main components. One set of conditions relates to the ground itself and how easy it is for water to pass through to ground water – this is the component that is identified through development of critical aquifer recharge area mapping. The other component relates to how likely it is for potential contaminants to reach ground water. The amount of potential contaminant material, chemical composition, and how the material is handled all contribute to this component, and are the key area where CARA standards are necessary to ensure that the potential is minimized. CARA regulations to minimize the potential for aquifer contamination have not changed significantly in the last ten years, and remain focused on ensuring that uses and activities with higher potential for contamination are appropriately evaluated (or prohibited) when occurring in CARAs.

Ecology has published guidance to assist local jurisdictions with developing protection measures in their CAO that includes an 8-step process for identifying, characterizing, and managing groundwater withdrawals and recharge impacts (Ecology, 2005). The guidance also includes BAS sources for protecting CARAs.
Best Available Science References Consulted During Consistency Review

See attached memo from AESI for a list of geologically hazard areas references consulted during consistency review


