Best Available Science Review and Gap Analysis

City of Tukwila Sensitive Areas Ordinance

Prepared for:

City of Tukwila
6200 Southcenter Blvd.
Tukwila, WA 98188

Prepared by:

THE WATERSHED COMPANY

750 Sixth Street South
Kirkland . WA 98033
p 425.822.5242
f 425.827.8136
watershedco.com

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1 Introduction

The Growth Management Act (GMA) mandates that cities develop policies and regulations to designate and protect critical areas, including wetlands, areas with a critical recharging effect on aquifers used for potable water, frequently flooded areas, geologically hazardous areas, and fish and wildlife habitat conservation areas (Revised Code of Washington [RCW] 36.70A.030(5)).

The GMA further requires that cities periodically review and evaluate their adopted critical areas policies and regulations, and that this review and update process consider and include best available science (BAS). Any deviations from science-based recommendations should be identified, assessed, and explained (Washington Administrative Code [WAC] 365-195-915). In addition, cities are to give special consideration to conservation or protection measures necessary to preserve or enhance anadromous fisheries.

In accordance with the GMA, the City of Tukwila (City) last completed a comprehensive update of its critical areas policies and regulations in 2010. The City's critical areas regulations are codified in Title 18, Zoning, of Tukwila Municipal Code (TMC Chapter 18.45). This code section includes the text from the adopted Sensitive Areas Ordinance (SAO), Ordinance No. 2301.

The purpose of this memorandum is to provide a review of the City's current SAO, noting gaps where existing regulations may not be consistent with BAS, the GMA, and/or its implementing rules. This document does not attempt to identify every instance where the existing SAO might be amended, but instead focuses on identifying more significant potential amendments. The primary intention of this gap analysis is to help guide the update of the City's SAO.

Sections 1 through 4 of this report provide a summary of the review and recommended changes to the four main subject areas in the City's SAO. Section 5 addresses frequently flooded areas, which are defined as critical areas under the GMA but regulated by the City's flood damage prevention ordinance outside of the SAO. Finally, Section 6 provides recommendations for general protective provisions. To highlight the findings of the gap analysis, a summary table is provided at the beginning of each section.

2 Wetlands

To better incorporate BAS into the wetlands code section, several code revisions are recommended (Table 1-1).

Table 1-1. Recommended revisions to wetlands regulations.

Code Section	Title	Review Comment / Recommendations*
18.45.080.A	Wetland Designations	• Remove reference to State delineation manual • Replace with identification and delineation language from WAC 173-22-035 • Consider defining period of validity for wetland delineations
18.45.080.B	Wetland Ratings	• Reference latest version of State rating system

18.45.080.D	Wetland Buffer Widths	• Update buffer width requirements to align with BAS
18.45.080.F	Variation of Standard Wetland Buffer Width	• Revise buffer averaging/reduction scheme to align with BAS
18.45.090.B	Alterations	• Update small wetland exemptions per BAS
18.45.090.E	Mitigation Standards	• Consider specifying mitigation ratio for buffer impacts • Consider adding a requirement for mitigation site protection
18.45.090.F	Wetland and Buffer Mitigation Location	• Consider integrating mitigation bank provisions into hierarchy defined in this section

* See discussion of comments/recommendations in the subsections below this table.

2.1 Wetland Designations (TMC 18.45.080.A)

TMC 18.45.080.A refers to the "Washington State Wetland and Delineation Manual [sic], as required by RCW 36.70A.175 (Ecology Publication #96-94) and consistent with the 1987 Corps of Engineers Wetland Delineation Manual." This section should be updated to include the language from WAC 173-22-035, which states that "Identification of wetlands and delineation of their boundaries… shall be done in accordance with the approved federal wetland delineation manual and applicable regional supplements."

The Washington State Department of Ecology (Ecology) model wetlands chapter (Ecology 2016) also recommends the following language: "Wetland delineations are valid for five years; after such date the City shall determine whether a revision or additional assessment is necessary."

2.2 Wetland Ratings (TMC 18.45.080.B)

TMC 18.45.080.B refers to the "Washington State Wetlands Rating System for Western Washington, (Washington State Department of Ecology, August 2004, Publication #04-06-025)." Ecology updated this rating system in June of 2014. The current BAS-based wetland rating system is the *Washington State Wetland Rating System for Western Washington* (Hruby 2014, Ecology publication No. 14-06-029). Using reference wetlands, Ecology calibrated the updated 2014 wetland rating system to maintain roughly the same distribution of wetland categories that were present under the prior 2004 rating system. A comparison sample of the distribution of wetland categories under the old and new rating systems is provided in Table 1-2 below (Hruby 2014).

Table 1-2. Number of sampled wetlands in each category based on their score for functions.

Category	2004 Rating System	2014 Rating System
I	13	11
II	52	44
III	39	49
IV	7	7

The substantive changes to the wetland rating system are: 1) a High, Medium, or Low ranking for each function instead of numeric scores; and 2) the opportunity section was replaced with two new sections: landscape potential and value. The shift to a High, Medium, Low ranking

scheme was prompted by a statistical analysis of wetland rating data, which indicated that the rapid-assessment wetland rating tool is not scientifically accurate beyond a qualitative ranking. As a result of this change, the total point range changed from 0-100 to 9-27 (Hruby 2014), with nine possible points each for water quality, hydrologic, and habitat functions.

In addition to updating the reference to the rating system itself, the City should update the individual point score references for each wetland category throughout TMC 18.45.080.B.

If the City wishes to avoid the need for future updates related to rating system versions, it should consider amending this section to refer to the 2014 rating system, "…or as revised and approved by Ecology," and removing references to specific point values.

2.3 Wetland Buffer Widths (TMC 18.45.080.D)

The City's existing wetland buffer widths are based on a departure from BAS supported by an analysis completed as part of the City's 2010 SAO update. The analysis evaluated existing buffer conditions and effective widths for "a representative sample of its wetlands" (City of Tukwila 2010). The departure memorandum states, "In general Tukwila wetlands would score very low for habitat function due to the urbanized nature of the city and the fact that most of the wetlands are isolated and surrounded by dense development" (City of Tukwila 2010). Accordingly, the standard buffer widths included in the City's regulations match Ecology's recommended standard buffers for wetlands with low habitat scores (fewer than six points under the 2014 rating system) adjacent to a proposed land use with high-intensity impacts (Table 1-3). The Watershed Company conducted an updated evaluation of the City's mapped wetlands in 2018 under the 2014 Western Washington Rating System. The updated analysis confirmed that the majority of wetlands within the City do have low habitat scores, and the remaining wetlands appear to have moderate habitat scores of six or seven under the 2014 Rating System.

Table 1-3. Standard wetland buffer widths in TMC and Ecology 2014.

Category	Wetland buffer width (ft), TMC	Wetland buffer width (ft), Ecology 2014, high-intensity land use impact		
		Habitat score <6	Habitat score 6-7	Habitat score 8-9
I	**100**	**100**	150	300
II	**100**	**100**	150	300
III	**80**	**80**	150	300
IV	**60**	**50**	50	50

For those projects that can mitigate the impacts and disturbances associated with surrounding land use, required buffer widths may be reduced. Table 1-4 lists impact-minimization measures which, when implemented in combination with a wildlife corridor to adjacent priority habitats where applicable, allow an applicant to reduce the standard buffer widths by up to 25 percent (Ecology 2016). The resulting standard buffer widths range according to habitat score from 75 to 225 feet for Category I and II wetlands and from 60 to 225 feet for Category III wetlands, and are 40 feet for Category IV wetlands.

Table 1-4. Measure to minimize impacts to wetlands (Ecology 2016)

Disturbance	Required Measures to Minimize Impacts
Lights	• Direct lights away from wetland
Noise	• Locate activity that generates noise away from wetland • If warranted, enhance existing buffer with native vegetation plantings adjacent to noise source • For activities that generate relatively continuous, potentially disruptive noise, such as certain heavy industry or mining, establish an additional 10' heavily vegetated buffer strip immediately adjacent to the outer wetland buffer
Toxic runoff	• Route all new, untreated runoff away from wetland while ensuring wetland is not dewatered • Establish covenants limiting use of pesticides within 150 feet of wetland • Apply integrated pest management
Stormwater runoff	• Retrofit stormwater detention and treatment for roads and existing adjacent development • Prevent channelized flow from lawns that directly enters the buffer • Use Low Intensity Development (LID) techniques where appropriate (for more information refer to the drainage ordinance and manual)
Change in water regime	• Infiltrate or treat, detain, and disperse into buffer new runoff from impervious surfaces and new lawns
Pets and human disturbance	• Use privacy fencing OR plant dense vegetation to delineate buffer edge and to discourage disturbance using vegetation appropriate for the ecoregion • Place wetland and its buffer in a separate tract or protect with a conservation easement
Dust	• Use best management practices to control dust

While the City's current approach results in a simpler set of standard buffers for the City to implement, it does not reflect the range of existing and potential wetland conditions present in Tukwila. Specifically, it does not account for any wetlands that provide greater than the lowest habitat function, despite the 2010 and 2018 analyses identifying several such wetlands. As a result, any opportunity to protect rare wetland habitat functions where they do exist, and/or where larger buffers are currently present (e.g. wetland complex near the intersection of 65th Avenue and Military Road wetland), is lost.

We recommend that the City update its buffer provisions to adopt the BAS-based approach developed for small cities. This approach provides flexibility for applicants while resulting in higher-functioning buffers that are sensitive to existing wetland functions. Standard buffer widths for wetlands with low habitat scores will not increase. Applicants are already required to submit a delineation and rating study prepared by a professional wetland scientist; this approach enables the City to use that information to make more prescriptive, site-specific decisions.

2.4 Variation of Standard Wetland Buffer Width (TMC 18.45.080.F)

TMC 18.45.080.F allows for reduction of the standard buffer width up to 50 percent where existing conditions are degraded and where the applicant proposes to enhance the degraded

buffer. However, per Ecology guidance, the BAS-based buffer widths described above "assume that the buffer is vegetated with a native plant community appropriate for the ecoregion. If the existing buffer is unvegetated, sparsely vegetated, or vegetated with invasive species that do not perform needed functions, the buffer should either be planted to create the appropriate plant community or the buffer should be widened to ensure that adequate functions of the buffer are provided" (Ecology 2016). In other words, functioning buffers of the widths listed above are the minimum necessary, per BAS, to protect wetland functions.

Rather than buffer reduction, Ecology guidance recommends buffer averaging to provide flexibility to applicants and accommodate site constraints. Buffer averaging may also be used to improve wetland protection when wetland functions vary spatially. Averaging should be limited to 75 percent of the standard buffer width and should not reduce the total buffer area.

To align with BAS and better protect Tukwila's wetlands, we recommend that the City revise this section to allow buffer averaging rather than reduction, and to limit that averaging to 75 percent of the standard buffer width.

2.5 Alterations (TMC 18.45.090.B)

TMC 18.45.090.B.5 provides an exemption for wetlands under 1,000 square feet with a habitat score under five where they are not associated with a riparian corridor or part of a wetland mosaic, and where they do not contain priority habitat. Per Ecology guidance, this exemption may be extended to isolated Category IV wetlands under 4,000 square feet. Neither exemption should apply to wetlands associated with shorelines of the state.

2.6 Mitigation Standards (TMC 18.45.090.E)

The mitigation standards and ratios presented in TMC 18.45.090.E generally align with BAS. To improve code usability, we recommend that the City add a provision defining the required mitigation ratio for wetland buffer impacts (1:1). To ensure effective mitigation, Ecology further recommends that mitigation areas and associated buffers be located in a sensitive areas tract or conservation easement consistent with TMC 18.45.170.

2.7 Wetland and Buffer Mitigation Location (TMC 18.45.090.F)

The provisions in TMC 18.45.090.F generally align with BAS in establishing preferences for mitigation location, with on-site mitigation as a first preference. While most local jurisdictions prefer that off-site mitigation be located within city boundaries, State and federal resource agencies advocate use of alternative mitigation methods such as mitigation banks, in-lieu-fee programs, or advance mitigation. The City's mitigation bank standards are found in the preceding section, .090.E. We recommend that the City integrate these standards into the preference hierarchy presented in section .090.F to clarify under what circumstances alternative mitigation methods should be used.

3 Watercourses

The City's watercourse regulations should be updated to improve protection and align with current BAS. A summary of code revisions for consideration is provided below (Table 2-1).

Table 2-1. Recommended revisions to watercourses regulations.

Code Section	Title	Review Comment / Recommendations*
18.45.100.A	Watercourse Ratings	• Consider removing reference to Types 1-4 to avoid confusion • Consider defining a process to verify stream conditions
18.45.100.C	Watercourse Buffer Widths	• Update buffer width requirements
18.45.100.E	Variation of Standard Watercourse Buffer Width	• Limit buffer reduction to ensure adequate minimum buffer widths • Consider adding allowance for buffer averaging
18.45.110	Watercourse Alterations and Mitigation	• Consider revising for usability

* See discussion of comments/recommendations in the subsections below this table.

3.1 Watercourse Ratings (TMC 18.45.100.A)

TMC 18.45.100.A defines watercourses according to the Washington State Department of Natural Resources (WDNR) Forest Practices water typing system, consistent with BAS. For each of the four watercourse classes (Types S, F, Np, and Ns), the code assigns a numerical class (Types 1, 2, 3, 4). This numerical system looks similar to, but does not align with, the former WDNR water classification system, which also used numerical classes (Types 1, 2, 3, 4, 5). To avoid confusion, we recommend removing the numerical classification system and either relying directly on WDNR terminology or utilizing a lettering system (e.g. Types A, B, C, D).

Critical area rules in the WAC were amended in January 2017 to recommend that, "Counties and cities that use the stream typing system developed by the department of natural resources should develop a process to verify actual stream conditions, identify flow alterations, and locate fish passage barriers by conducting a field visit. Field verification of all intermittent or nonfish bearing streams should occur during the wet season months of October to March or as determined locally" (WAC 365-190-130(4)(f)(ii)). This requirement could be added to the specific requirements for watercourse sensitive area studies in TMC 18.45.040.B. In incorporating this requirement, other jurisdictions have added a qualifying clause such as "as practicable" to minimize impacts on project applicants.

3.2 Watercourse Buffer Widths (TMC 18.45.100.C)

A wide range of stream buffer widths are recommended by BAS, depending on the target functions and buffer condition. Buffer continuity and vegetative quality are important factors in determining effective buffer widths. Stream buffer requirements under current code are within the range, at the low end of the recommended scale for Type F and Type Ns watercourses.

Table 2-2 below provides a summary of buffer width ranges derived from BAS and other local jurisdictions.

Table 2-2. Buffer ranges by watercourse type per TMC, BAS, and other jurisdictions.

Stream Type	Watercourse Buffer (ft), TMC	Sample Buffer Ranges (ft)
S	Regulated under SMP	115-165
F	100	100-165
Np	80	50-65
Ns	50	50-65

The City completed an analysis of existing watercourse buffers as part of its 2010 SAO update. This analysis found that many buffers are in a degraded condition, with little native vegetation and/or constrained by surrounding infrastructure and development. Where redevelopment occurs in these areas, vegetative enhancement of the buffer can provide an important tool to improving buffer function within an urban environment.

3.3 Variation of Standard Watercourse Buffer Width (TMC 18.45.100.E)

TMC 18.45.100.E currently allows buffer reduction up to 50 percent with buffer enhancement. Based on the functions that different widths of buffers provide, fish bearing streams should remain as close to 100 feet as possible; however, reductions of up to 25 percent with enhancement are likely to provide adequate protection for most small stream channels. Buffers narrower than 33 feet (i.e. a reduced buffer on a Type Ns watercourse) are generally not considered functionally effective (The Watershed Company 2011), and these should not be permitted.

The City could continue to allow flexibility through buffer reduction with enhancement. However, for consistency with the wetland regulations, the City may consider utilizing buffer averaging only. Given that most existing watercourse buffers are degraded, the City should consider requiring buffer enhancement when buffer averaging is allowed.

3.4 Watercourse Alterations and Mitigation (TMC 18.45.110)

The provisions of this section are generally consistent with BAS. We recommend a review of this section for organization, redundancy, and clarity of language. For example, subsection D, Mitigation Standards, uses restoration terminology inconsistent with other sections in the SAO, and there are several duplicative provisions in subsection B, Alterations, addressing fish passable watercourse crossings. The City should also consider updating the reference to the 2003 WDFW culvert design manual to refer instead to the 2013 WDFW "Water Crossing Design Guidelines" manual.

4 Geologically Hazardous Areas

TMC 18.45.120-.130 and 18.45.140 address areas of potential geologic instability (landslides) and abandoned coal mines, respectively. Review of these two sections is presented together under the umbrella of geologically hazardous areas; we recommend that the City consolidate these

two sections under a single section to improve clarity and usability and align with GMA terminology. Our review of the SAO did not include an in-depth review of BAS related to geologically hazardous areas. As such, recommendations are focused on code usability and best practices. Table 3-1 provides a summary of these recommendations for the City's consideration.

Table 3-1. Recommended revisions to geologically hazardous area regulations.

Code Section	Title	Review Comment / Recommendations*
18.45.120-.140	All	• Consider consolidating landslide hazard and abandoned coal mine hazard provisions into a single "geologically hazardous area" section
18.45.120.A	Designation	• Consider adding specific information on mapping sources • Consider designating seismic hazard areas and developing associated protective provisions
18.45.120.C	Buffer Widths	• Consider defining a default buffer in the absence of a geotechnical report
18.45.130.C	Alterations	• Consider adding specific protective provisions

* See discussion of comments/recommendations in the subsections below this table.

4.1 Designation (TMC 18.45.120.A)

TMC 18.45.120.A designates four classes of potential geologic instability, with increasing hazard from classes one to four. Classes are defined by slope, soil characteristics, historic landslides, and/or hydrology. While the City's Sensitive Areas Map depicts these areas, neither the map nor the code refer to public sources of mapping information. We recommend that the City revise the designation section or add a mapping section (similar to the approach for fish and wildlife habitat conservation areas) to include this information. Potential sources of mapping information include:

- For historic landslides, areas designated as quaternary slumps, earthflows, mudflows, or landslides on maps published by the U.S. Geological Survey or the WDNR Division of Geology and Earth Resources;
- For potential or historic landslides, those areas mapped by the WDNR (slope stability mapping) as unstable (U or class 3), unstable old slides (UOS or class 4), or unstable recent slides (URS or class 5);
- For soil characteristics, the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS) Official Soil Survey Data; and
- For general instability, those areas mapped by the NRCS as having a significant limitation for building site development.

The City does not currently designate areas of erosion hazard or seismic hazard. Per WAC 365-190-120(5), "Erosion hazard areas include areas likely to become unstable, such as bluffs, steep slopes, and areas with unconsolidated soils." Erosion hazard areas also include channel migration zones. The City's existing designation of areas of potential geologic instability partially overlap with the WAC definition. We recommend that the City expand this designation to include erosion hazard areas, identifying such areas using the NRCS Official Soil

Survey Data where soils are characterized as having a "severe" or "very severe" erosion hazard based on slope and soil erosion factor K. A preliminary review of the NRCS data shows areas of severe erosion hazard occurring in the city between Southcenter and Interstate 5.

TMC 18.45.030.B states, "Areas of seismic instability are defined and regulated through the Washington State Building Code." While the City may wish to continue deferring to the State for regulation of these areas, we recommend clarifying how and where such areas are designated in the City. Per WAC 365-190-120(7), "Seismic hazard areas must include areas subject to severe risk of damage as a result of earthquake induced ground shaking, slope failure, settlement or subsidence, soil liquefaction, surface faulting, or tsunamis." WDNR maps the risk of damage as a result of soil-amplified earthquake-induced ground shaking, or site class, on a countywide basis. It also maps liquefaction susceptibility. Within the city, the WDNR maps show broad areas of moderate to high liquefaction susceptibility on either side of the Duwamish/Green and throughout Southcenter. These areas generally coincide with areas of moderate to severe amplification of ground shaking. Both of these factors are derived from underlying soil characteristics (Palmer et al. 2004). The City should consider evaluating these resources for relevance to new sensitive area designations in Tukwila.

4.2 Buffer Widths (TMC 18.45.120.C)

TMC 18.45.130.C requires that a geotechnical support be submitted, in which the need for and width of any buffers or setbacks be specified. Consistent with BAS and in accordance with the precautionary principle, we recommend that the City define a default or standard buffer of 50 feet from all sides of Class 2 or higher areas of potential geologic instability. Reduction or elimination of this buffer may be justified through the required geotechnical report. This approach clearly conveys the City's intent to protect these sensitive areas as well as property and human safety, and ensures a default level of protection while enabling the applicant's hired geotechnical engineer to justify relief from this requirement on behalf of his or her client.

4.3 Alterations (TMC 18.45.130.C)

The existing provisions in TMC 18.45.130.C require that an applicant, through submittal of a geotechnical report, demonstrate that the proposed project is compatible with the areas of potential geologic instability present on-site. These provisions provide a catch-all and place the onus on the geotechnical consultant to recommend any project conditions necessary to achieve that compatibility and ensure the safety of the project. To improve clarity for the applicant and inform/facilitate permit review for City staff, we recommend expanding this code section to include more specific protective provisions. Potential provisions include:

- Requiring that critical facilities be sited outside of, and not below, potential areas of geologic instability unless there is no practical alternative, as demonstrated by the applicant;

- Requiring that land disturbing activities provide for stormwater quality and quantity control, including preparation of a TESC and permanent drainage plan prepared by a professional engineer;
- Prohibiting removal of vegetation from areas of potential geologic instability and their buffers unless permitted as part of an approved alteration, in which case it should be minimized to the extent practicable;
- Requiring that surface drainage, including downspouts, not be directed across the face of areas of potential geologic instability;
- Requiring that proposed activities minimize the amount of grading and filling to the amount necessary; and
- Requiring that the proposed alteration not result in greater risk or increased buffers on neighboring properties.

5 Fish and Wildlife Habitat Conservation Areas

The City's fish and wildlife habitat conservation area regulations should be updated to improve protection and align with current BAS. To better align with GMA definitions, we recommend that these regulations be combined with the SAO sections on watercourses, discussed in Section 2, above. A summary of code revisions for consideration is provided below (Table 4-1).

Table 4-1. Recommended revisions to fish and wildlife habitat conservation area regulations.

Code Section	Title	Review Comment / Recommendations*
18.45.150	All	• Consider combining with 18.45.100, Watercourses, per GMA definition
18.45.150.A	Designation	• Revise to align with GMA list • Incorporate relevant language from 18.45.150.B, Mapping • Consider defining process of designation of habitats of local importance
18.45.150.B	Mapping	• Consider revising language to be more specific
18.45.150.C	Buffers	• Add requirement for site-specific buffers based on analysis by qualified professional
18.45.150.D	Uses and Standards	• Add requirement for habitat assessment

* See discussion of comments/recommendations in the subsections below this table.

5.1 Designation (TMC 18.45.150.A)

The GMA list of designated fish and wildlife habitat conservation areas was amended in January 2017 to include (WAC 365-190-130(2):

(a) Areas where endangered, threatened, and sensitive species have a primary association;
(b) Habitats and species of local importance, as determined locally;
(c) Commercial and recreational shellfish areas;
(d) Kelp and eelgrass beds; herring, smelt, and other forage fish spawning areas;

(e) Naturally occurring ponds under twenty acres and their submerged aquatic beds that provide fish or wildlife habitat;
(f) Waters of the state;
(g) Lakes, ponds, streams, and rivers planted with game fish by a governmental or tribal entity; and
(h) State natural area preserves, natural resource conservation areas, and state wildlife areas.

The City's list is generally consistent with the WAC and needs only minimal revisions and reorganization. We recommend that the City clarify those priority habitats and species that have been designated locally, including mudflats and marshes and areas critical for habitat connectivity as well as eagle habitat and heron rookeries (currently TMC 18.45.150.A.2, .5, and .9).

The subsequent section, Mapping, contains language that provides additional information about these designated areas, referring to specific features within the city (TMC 18.45.150.B.1 and .2). We recommend that this information be relocated into TMC 18.45.150.A, Designation.

Finally, the City should consider codifying the process used to identify and designate habitats and species of local importance.

5.2 Mapping (TMC 18.45.150.B)

TMC 18.45.150.B.2 lists sources of maps and data to guide the City with respect to the location of fish and habitat conservation areas. Additional sources for consideration include:

- Washington Department of Fish and Wildlife (WDFW) Salmonscape maps
- WDNR water type maps
- U.S. Fish and Wildlife Service Information for Planning and Conservation Maps
- U.S. Fish and Wildlife Service and National Marine Fisheries Service Critical Habitat Maps

5.3 Buffers (TMC 18.45.150.C)

While this section defines a default buffer of 100 feet, it does not identify how an applicant should determine whether a site-specific buffer width is necessary and what that buffer width may be. Consistent with the City's approach for geologically hazardous areas, we recommend that this section be amended to require that buffers be based on site-specific conditions; management recommendations provided by the WDFW Priority Habitats and Species Program, if applicable (see below); and the recommendation of a qualified professional in a sensitive area special study.

5.4 Uses and Standards (TMC 18.45.150.D)

A requirement for a habitat assessment prepared by a qualified professional should be added to this subsection, or to TMC 18.45.040, Sensitive Area Special Studies, to better reflect BAS. To align with BAS, the habitat assessment should include a discussion of any federal, state, or local special management recommendations, including WDFW habitat management

recommendations, that have been developed for species or habitats located on or adjacent to the project area, and a description of how the project employs those recommendations. The habitat assessment should also include a detailed discussion of the direct and indirect potential impacts on habitat by the project, including both site-specific and landscape-scale impacts as well as impacts to water quality. At the local scale, factors such as habitat structure and composition, species features, recruitment opportunity for snags and large woody debris, and water should be managed for wildlife at present and in the future. Landscape-scale features requiring consideration in land use planning include patch size and juxtaposition, edge, corridors and fragmentation, and proximity of other sensitive areas.

6 Frequently Flooded Areas

Frequently flooded areas in the City of Tukwila are regulated under TMC Chapter 16.52, Flood Plain Management. The purpose of this chapter is to minimize public and private losses due to flood conditions; it applies to special flood hazard areas in the city, as identified by the Federal Emergency Management Agency (FEMA) in Flood Insurance Rate Maps. BAS-recommended changes to this chapter are discussed below and summarized in Table 5-1.

Table 5-1. Recommended revisions to frequently flooded area regulations.

Code Section	Title	Review Comment / Recommendations*
18.45	Applicability	• Consider adding a subsection to Chapter 18.45 to address GMA-specific requirements in frequently flooded areas • Determine preferred method for compliance with FEMA BiOp

* See discussion of comments/recommendations in the subsections below this table.

The GMA recognizes that, in addition to flood hazard, frequently flooded areas also provide important hydrological functions and vital salmon habitat. The 2008 FEMA *National Marine Fisheries Service Biological Opinion* (FEMA BiOp) (NMFS 2008) found that implementation of the National Flood Insurance Program (NFIP) in the Puget Sound region jeopardizes the continued existence of federally threatened salmonids and resident killer whales. As a result, NMFS established Reasonable and Prudent Alternatives to ensure that development within special flood hazard areas (100 year floodplain), floodway, channel migration zone, and riparian buffer zone do not adversely affect water quality, water quantity, flood volumes, flood velocities, spawning substrate, or floodplain refugia for listed salmonids. The City's flood regulations must adhere to the FEMA BiOp through application of these Reasonable and Prudent Alternatives to prevent and/or minimize the degradation of channel and floodplain habitat (Ecology 2015). Specifically, the FEMA BiOp requires changes to implementation of the National Flood Insurance Program (NFIP) in order to meet the requirements of the Endangered Species Act (ESA) in the Puget Sound watershed. Because the NFIP is implemented by FEMA through participation by local jurisdictions that adopt and enforce floodplain management ordinances, FEMA has delegated responsibility to the local jurisdictions to ensure that development does not adversely affect listed species.

To comply with the requirements of the FEMA BiOp, the City has three options, or "doors:"

1. Adopt the model ordinance developed by FEMA (FEMA 2010);
2. Develop floodplain regulations that protect floodplain functions on a programmatic basis; or
3. Require the completion of a floodplain habitat assessment for any development within the floodplain. Habitat assessments must evaluate impacts to stormwater, floodplain capacity, and vegetative habitat.

Unless the City adopts the model ordinance or develops customized floodplain regulations that are reviewed and approved by FEMA, the third option, "Door 3," is the default requirement. The first option, the model ordinance, would most likely represent the most conservative approach to protecting floodplain functions, but it would also be expected to be the most restrictive option in terms of future development and provide the least flexibility in implementation. The second option allows local jurisdictions to establish regulations that recognize local conditions and may incorporate programs that enhance floodplain functions into the evaluation of how floodplain functions are maintained. However, FEMA must approve any "Door 2" approach before it is implemented through the submittal and review of a programmatic checklist. "Door 3" is the most common approach taken by local jurisdictions.

Ecology also recommends applying standards more stringent than the minimum FEMA-required protections. For example, minimum elevation of new structures should be at least two or three feet above the Base Flood Elevation (BFE), instead of just one foot.

In incorporating these new requirements, the City should consider adding a section to the SAO specific to frequently flooded areas. The section would designate these areas pursuant to the GMA, define requirements associated with the FEMA BiOp, and refer to TMC Chapter 16.52 for all other regulations in frequently flooded areas.

7 General Protective Provisions

Protective provisions broadly applicable to all sensitive areas are found in sections 18.45.020 through 18.45.070 and 18.45.160 through 18.45.170 TMC. General recommendations for revisions or additions to these sections are discussed below and summarized in Table 6-1.

Table 6-1. Recommended revisions to general protective provisions.

Code Section	Topic	Review Comment / Recommendations*
18.45.030, 18.45.040, 18.06.018	Applicability	• Consider clarifying applicability by defining adjacency according to maximum potential buffer widths
18.45	Setbacks	• Require setbacks from all applicable sensitive areas
18.45	Mitigation sequencing	• Require mitigation sequencing for all sensitive areas
18.06	Definitions	• Review and update per BAS

* See discussion of comments/recommendations in the subsections below this table.

7.1 Applicability (TMC 18.45.030)

Sections 18.45.030 and 18.45.040 TMC indicate that SAO requirements apply where sensitive areas exist on or adjacent to an applicant's property. The definition of "adjacent" in section 18.06.018 TMC states, "'Adjacent' means lying near or close to; sometimes, contiguous; neighboring. Adjacent implies that the two objects are not widely separated, though they many not actually touch."

In implementation, a subjective or non-specific definition of adjacency can lead to uncertainty regarding SAO applicability. For example, an applicant with knowledge of a wetland on the far side of a neighboring property may not know whether a project on his or her own property will be subject to SAO requirements. We recommend that the City revise the current definition of "adjacent" to clearly define a distance to the edge of each type of sensitive area based on the maximum potential buffer. For example, under the current wetland buffer regulations, the aforementioned applicant would not be subject to SAO requirements if the neighbor's wetland is more than 100 feet away.

7.2 Setbacks (various)

In the existing SAO, setbacks are required from wetland buffers (TMC 18.45.080.E) and watercourse buffers (TMC 18.45.100.D). Building setbacks provide access for maintenance and should apply to all sensitive areas, with the possible exception of seismic hazard areas. Setbacks 10 to 15 feet wide are adequate. We recommend that the City add a general requirement for building setbacks from all sensitive area buffers or, where no buffers are required, from sensitive area edges.

7.3 Mitigation sequencing (various)

Demonstration of mitigation sequencing is a required component of wetland and watercourse sensitive area studies (TMC 18.45.040.B). A definition of mitigation sequencing is provided in the wetlands section (TMC 18.45.090.C). Mitigation sequencing is a critical component of sensitive areas protection, helping to ensure that adverse impacts permitted under the SAO are the minimum necessary, and that those impacts will be compensated for. We recommend that the City develop a general mitigation section, clarifying that mitigation is broadly required in all sensitive areas and defining the mitigation sequencing process.

7.4 Definitions (TMC 18.06)

In association with the revisions recommended by this gap analysis, the City should review and revise the definitions in Chapter 18.06 TMC relevant to the SAO to better align with BAS.

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