

8 October 2015

Bill Stalzer  
Stalzer and Associates  
603 Stewart Street, Suite 512  
Seattle, WA 98101

**Re: Shoreline Master Program Recommended Buffer Width for Yellowhawk Creek**

Dear Bill:

The draft Shoreline Master Program submitted to the Washington Department of Ecology in June, 2015, includes reference to the County's existing critical areas ordinance<sup>1</sup> which includes a 50-foot wide buffer along Yellowhawk Creek. On June 17, 2015, Walla Walla County's Shoreline Master Program (SMP) project management team made a recommendation to Bill Stalzer, project team leader, and the consulting team to review shoreline buffer requirements along Yellowhawk Creek in response to information presented at a Regional Working Group (RWG) meeting on June 16, 2015. Specifically, questions were raised at this RWG meeting regarding the proposed use of the County's existing 50-foot wide critical area ordinance buffer for the shoreline designated area of Yellowhawk Creek.

This letter provides an overview of our additional analysis and a summary of our findings regarding the recommended regulatory buffer width for Yellowhawk Creek within Walla Walla County (County) shoreline jurisdiction. This work included a detailed GIS analysis of existing site conditions, assessing width and type of vegetative cover, development footprints and proximity to Yellowhawk Creek, floodplain extent, geologically hazardous areas, and potential future development at a more detailed parcel-level scale than the SMP's Shoreline Analysis Report (TWC et al. 2014). This new work also provided a review of existing best available science pertaining to stream temperature, shading, large woody debris recruitment, sediment and nutrient control, infiltration, and wildlife habitat. Our preliminary findings were discussed during a meeting with staff from the Washington Departments of Fish and Wildlife and Ecology on September 23, 2015 as well as a project management team meeting that same day.

The existing land use conditions, ecological functions, and projected land use change along Yellowhawk Creek within the County's shoreline jurisdiction are described below, followed by an assessment of the applicable best available science concerning the buffer width required to

---

<sup>1</sup> Critical area regulations are included as Appendix A in the SMP but are only slightly modified from the existing Critical Areas Ordinance to meet consistency requirements under the Shoreline Management Act.

protect functions along the creek. The memo concludes with a recommendation options for the SMP designated buffer width based on the aforementioned analysis and SMP Guidelines.

The SMP Guidelines require master programs to protect the functions provided by shoreline vegetation and allows that such protections be developed based on existing shoreline conditions which includes development and anticipated uses. Conversely, the requirements to protect critical areas under the Growth Management Act (GMA) are different, focusing mainly on protecting the functions and values of the critical area. Therefore, buffer widths required to be compliant with SMP Guidelines may differ from those developed for non-shoreline critical areas regulations.

### **Existing Conditions**

#### *Environmental Setting*

Yellowhawk Creek is a tributary to the Walla Walla River, entering the river just west of Old Milton Highway. It originates as a distributary of Mill Creek at the Corps-operated diversion structure located just south of Walla Walla Community College. Downstream from the diversion structure three tributaries enter Yellowhawk Creek (Caldwell, Russell, and Cottonwood Creeks, respectively). Shoreline jurisdiction along Yellowhawk Creek begins at the confluence with Cottonwood Creek, and extends downstream to the confluence with the Walla Walla River. Upstream of Cottonwood Creek, the stream buffer along Yellowhawk Creek is determined by the County's Critical Areas Ordinance (CAO). As mentioned above, this memorandum addresses only that portion of Yellowhawk Creek within shoreline jurisdiction.

Floodplain is mapped over 68% of the area within Yellowhawk Creek shoreline jurisdiction. The Mill Creek diversion dam operated by the Corps limits flood flows from entering Yellowhawk Creek but may also be adjusted to regulate flows during non-flood periods to maintain adequate flows to sustain fish and fish habitat. The Corps and Ecology have developed a general schedule for non-flood flow regulation (MOU between Corps and Ecology 2012). Spring Chinook are documented throughout all of Yellowhawk Creek. Spawning habitat for Summer Steelhead is also documented (WDFW Salmonscape 2015). No wetlands are mapped within the Yellowhawk Creek shoreline jurisdiction.

In addition to flow regulation at the Mill Creek diversion dam, flow in Yellowhawk Creek is also affected by water withdrawals for agricultural uses. However, the amount of water withdrawal has not been quantified.

The width of riparian tree and shrub vegetation is limited along Yellowhawk Creek due to agricultural and rural residential development. Traditional agricultural methods change complex natural ecosystems to simplified monocultures for ease of production. Due to a landscape change from a complex natural system, to a monoculture, habitat for fauna becomes reduced and disconnected. Although traditional farming offers potential for limited cover,

habitat, and food to local fauna; the habitat value within agricultural areas is greatly reduced. In looking at the habitat value various land uses have, traditional agricultural methods are often the middle ground between habitat within the urban environment and untouched natural habitat. Along with a lack of ecosystem services a natural ecosystem could provide, monocultures often result in a spotty patchwork of habit corridors, in turn often resulting in a disconnect between animals and their habitat (Tscharrntke et al. 2005).

Despite agricultural and rural residential development impacts, dense bands of forested and shrub vegetation exist along the banks of the channel in most places. Based on assessment of aerial imagery using Geographic Information System (GIS) software, the width of intact riparian vegetation typically ranges between 50 and 100 feet along the creek within shoreline jurisdiction, though depending upon the precise stream channel location and adjacent land use, some existing vegetated buffers may be less than 50 feet or greater than 100 feet. Vegetative functions provided by the riparian area include the provision of large woody debris (LWD) and other organic matter to the creek, shading to reduce temperature increases, filtration of upland inputs, including excess nutrients, fine sediment, and toxic substances, bank stabilization and wildlife habitat.

#### *Existing Land Use*

Based on Walla Walla County Assessor data for parcels completely or partially located within shoreline jurisdiction, the Yellowhawk Creek shoreline is characterized primarily by agricultural uses. Agriculture accounts for approximately 70% of the shoreline land area, followed by rural residential uses at 25%. Agricultural uses occur throughout the reach, while rural residential uses are concentrated on the northern bank of the creek west of SR 125. SR 125 and Old Milton Highway are the two major thoroughfares in the area, and both cross Yellowhawk Creek via vehicular bridges.

The existing shoreline vegetation generally provides visual and physical screening between the channel and agricultural lands and residential development landward of the creek. Based on further review of GIS data as part of this analysis, 45 structures are present within Yellowhawk Creek's shoreline jurisdiction on 57 total parcels. Eight of those structures are present within 50 feet of the shoreline (four primary and four accessory structures). The number of structures present increases with distance from the shoreline. 13 structures are present within 75 feet of the shoreline and 21 structures are present within 100 feet of the shorelines. Conversely, riparian canopy cover along Yellowhawk Creek decreases with increasing distance from the stream. Based on a GIS analysis of aerial imagery from 2013, riparian canopy covers approximately 74% of the areas within 50 feet of Yellowhawk Creek, 61% of the area within 75 feet and 51% of the area within 100 feet. According to the draft SMP, all pre-existing legal residential and appurtenant structures would be considered conforming (draft SMP, Section 7.1.10.E.)

### *Foreseeable Future Development*

Of the 57 parcels located within shoreline jurisdiction, all but one are zoned Rural Residential 5. The remaining parcel, located southeast of the intersection between SR 125 and Old Milton Highway, is zoned Agriculture Residential 10. The Draft Cumulative Impacts Analysis for Walla Walla County's Shoreline Master Program (TWC and BERK 2015) included an analysis of potential future development within and along the shorelines of Walla Walla County. The estimate was derived using a land capacity analysis method which identified the total (or gross) vacant and underutilized land area based on local development regulations for density and minimum lot size. Vacant properties along Yellowhawk Creek are each typically well under 5 acres. Combined, these properties total approximately 18 acres, of which approximately 4 acres are within shoreline jurisdiction. All of these properties would be considered legal non-conforming lots. In total, these properties could generate up to 9 new single family homes, though most of these properties have less than an acre of area within shoreline jurisdiction. As a result, most of these new homes are not likely to be located in shoreline jurisdiction.

The Rural Residential 5 zoning designation could allow for future subdivision of existing parcels currently in agricultural use if they are greater than 10 acres. Based on an estimate of potential subdivision of land, minimum lot frontage requirements in County zoning standards, and the presence of an expansive 100-year floodplain, we estimate there to be at most 12 new lots which would intersect shoreline jurisdiction if all available lands were subdivided. Based on the current agricultural land use and past rate of land division, it is unlikely that many of these lots would be subdivided in the near future.

### **Riparian Buffer Science**

A buffer of vegetation along streams can be an effective means of protecting valuable aquatic resources from the potential negative impacts of human use on adjacent land. A vegetated streamside buffer filters nonpoint source pollutants from upland runoff and provides habitat for a balanced, integrated, and adaptive community of riparian aquatic organisms (Welsch 1991). While most agree buffers are beneficial, the specific habitat values with respect to buffer width are often debated. Width is the most important controllable variable in determining the effectiveness of buffers in reducing pollutants and protecting stream health. Buffers that are too narrow may not be sustainable or effective at protecting stream banks while buffers that are wider than needed unnecessarily limit the use of adjacent land. Varying site characteristics such as topography, hydrology, geology, and land use also play a large factor. As noted above, land-use adjacent to the portion of Yellowhawk Creek within jurisdiction is primarily agricultural based, thus a buffer width sufficient to provide habitat and adequately reduce nonpoint source pollutants such as fertilizer and sediment is necessary.

The scientific literature varies on the width of riparian habitat buffer necessary depending on the system and the type of functions needing protection. Walla Walla County's existing critical areas regulations which reference the Washington Department of Fish and Wildlife's (WDFW)

Priority Habitats and Species (PHS) publication: *Management Recommendations for Washington's Priority Habitats: Riparian*, require a buffer of 50 feet on the entire stretch of Yellowhawk Creek from the Walla Walla River upstream to Mill Creek.<sup>2</sup> The development of the existing critical areas regulations was supported by a Critical Areas Ordinance, Best Available Science Review prepared for Walla Walla County by HDR, Inc. in 2008 (BAS Report). The BAS Report identifies a range of buffer widths depending upon functions.

Buffers necessary to protect salmonid habitat are largely driven by the function of LWD recruitment. As reported in the BAS Report, these widths typically range between 100 and 200 feet or a minimum of 1 Site Potential Tree Height (SPTH) to allow recruitment of LWD to influence channel morphology, instream cover, food resources, and sediment transport. SPTH refers to the average maximum tree height at maturity. The BAS report indicates that a SPTH of 110 feet has been established for eastside Washington forests. These characteristics are more important in smaller streams than in larger rivers (HDR 2008).

Sediment removal is also identified as an important function adjacent to agricultural uses. Buffers necessary to control sediment input to streams may range between 100 and 200 feet (Lowrance et al. 1988). Larger buffers may be necessary over hillslopes ranging from 0 to 20 percent (Cooper et al. 1988). Wenger's (1999) literature review found that 100 foot buffers are sufficient to trap sediments under most circumstances.

The BAS Report summarizes the buffer widths necessary to protect riparian functions, indicating on pages 2-42 and 2-43, that a buffer width of approximately 75% of the SPTH is generally needed to provide minimum protection of primary stream buffer functions including stream shading, litter inputs, LWD, and nutrient regulation. However, the BAS Report concludes on page 2-45 that a buffer width equal to 1 SPTH would "provide a broad range of riparian functions important for sustaining salmonids."

It is important to distinguish that the riparian vegetation along the portion of Yellowhawk Creek within jurisdiction is composed of mainly deciduous vegetation and may not meet the same height threshold as the SPTH of eastside Washington forests. In Table 6, page 40 of Ecology's 2007 Walla Walla Watershed Temperature Total Maximum Daily Load, "average tree canopy height" for Yellowhawk Creek is 22 meters (72 feet) based on "Potential vegetation composition, height, and density" which includes Yellowhawk Creek within the "deciduous zone" of Walla Walla County having height dominant plants of Willow, Alder, and interspersed Black Cottonwood, although some conifers may be present. Areas within the coniferous zone of Walla Walla County have average tree canopy height of up to 28 meters (91 feet). While "average tree canopy height" is not synonymous with SPTH, this Ecology publication does acknowledge the disparity between deciduous and coniferous tree canopies.

---

<sup>2</sup> WDFW submitted comments on Walla Walla County's BAS Report and draft Critical Areas Ordinance update in 2008, in which they suggested that a buffer width of 75 to 100 feet would provide "minimum functions important to protecting steelhead habitat" in Yellowhawk Creek (Divens 2008).

## Summary

A main tenet of the Shoreline Management Act (SMA) is “protecting against adverse effects to the public health, the land and its vegetation and wildlife, and the waters of the state and their aquatic life.” The SMP Guidelines require master programs to protect the functions provided by shoreline vegetation, and allows that such protections be developed based on existing conditions. Shoreline buffers must be based on shoreline ecological functions, development patterns and anticipated preferred uses. Yellowhawk Creek, between the Walla Walla River and Cottonwood Creek, has recently been designated as a Shoreline of the State and therefore is subject to the regulatory authority of the SMA. Upstream of the confluence with Cottonwood Creek, Yellowhawk Creek and its associated buffer are regulated by the County’s CAO.

Upon review of the best available science, existing ecological conditions, and existing land use and development, it is clear that the shoreline buffer along Yellowhawk Creek should be greater than the currently proposed 50 feet. A buffer width of 100 feet would provide adequate protection of shoreline ecological functions. A buffer width of 75 feet may be acceptable in some areas, dependent upon the level of existing development. The Yellowhawk Creek riparian area within jurisdiction provides important fish and wildlife habitat functions for priority species. An intact vegetated buffer containing trees and shrubs is present, generally varying in width between 50 and 100 feet and even greater than 100 feet in some places depending upon channel location downstream of Cottonwood Creek. Over 50% of the area within 100 feet and 60% of the area within 75 feet of Yellowhawk Creek has riparian tree canopy cover. Additional shrub and groundcover vegetation is present in other areas within jurisdiction.

Future changes in land use are likely limited to residential development as no new agricultural uses are expected to occur in Yellowhawk Creek shoreline jurisdiction. Based on the projected land use analysis, development would likely be limited to nine new residences on existing vacant parcels which intersect shoreline jurisdiction. However, most if not all of these nine new residences could be located entirely outside of shoreline jurisdiction.

### *Option 1*

Recognizing that some shoreline sections along Yellowhawk Creek have intact riparian areas greater than 75 feet wide, one buffer option would be to utilize a 75-foot wide standard buffer, but require a larger buffer up to 100 feet wide if an intact riparian condition is present. This option would encumber fewer existing residences than a 100-foot wide buffer. However, this option would require involvement of a qualified professional<sup>3</sup> when development is proposed to determine the extent of riparian area. This would be a cost to an applicant and could prove

---

<sup>3</sup> Qualified profession is defined in the draft SMP, Section 2.0

difficult for administrative staff to review due to its technical nature. Additionally, this option would not qualify for any form of buffer averaging or buffer reduction because the buffer is already less than 100-foot wide buffer supported in the scientific review. This limits flexibility and any potential for future enhancement of buffer function.

### *Option 2*

Given the existing ecological functions, salmonid use, and riparian conditions within shoreline jurisdiction along the creek, existing and projected future land use and the applicable BAS summarized above, a standard regulatory buffer width of 100 feet on Yellowhawk Creek would provide for adequate protection for fish and wildlife species, while recognizing the existing condition of shoreline jurisdiction and the tenets of the SMA. This is based on the following:

- A 100-foot wide buffer is near the SPTH listed for eastern Washington forests (110 feet), but recognizes the dominant deciduous canopy cover along Yellowhawk Creek which is less than typical eastern Washington forests;
- Existing width of riparian tree and shrub vegetation along Yellowhawk Creek is generally between 50 and 100 feet, but may be greater than 100 feet in some places;
- Likely future development of nine residences could all occur outside of a 100-foot buffer

To allow some development flexibility, a 100-foot buffer width could be administratively reduced by 25 percent to a minimum width of 75 feet through such common practices as buffer averaging or buffer reduction with enhancement<sup>4</sup>. A buffer width of 75 feet is approximate to the average tree height (72 feet) for the deciduous zone along Yellowhawk Creek, suggesting that a minimum distance of 75 would be sufficient for LWD recruitment through tree fall. However, a standard buffer width of 75 feet may not provide for protection of all riparian functions.

This approach would offer sufficient protection of buffer function, allow for property owner flexibility and the opportunity to improve buffer function, and minimize cost and administrative burden to both the property owner and the County. This approach would also be consistent with other shoreline waters throughout the County which have a 100-foot wide buffer according to the County's CAO.

Please call if you have any questions.

---

<sup>4</sup> See Appendix A, Section 6.10 and 6.12 for buffer averaging and buffer reduction options.

Sincerely,



Dan Nickel  
Environmental Engineer



Greg Johnson  
Fisheries Biologist



Clover Muters  
Environmental Planner

#### Sources

- Cooper, J. R., J. W. Gilliam, R. B. Daniels and W. P. Robarge. 1987. Riparian areas as filters for agricultural sediment. *Soil Science Society of America Journal* 51:416-420.
- Divens, K. 2008. WDFW comment on Best Available Science synthesis and draft Critical Areas Ordinance update. Letter to Walla Walla County Community Development. September 3, 2008.
- Google Inc. 2015. Google Earth. [Software].
- HDR, Inc. 2008. Walla Walla County Critical Areas Ordinance Best Available Science Review.
- Lowrance, R. R., S. McIntyre and C. Lance. 1988. Erosion and deposition in a field/forest system estimated using cesium-137 activity. *Journal of Soil and Water Conservation* 43: 195-99.
- Tscharntke, Teja Alexandra M. Klein, Andreas Kruess, Ingolf Steffan-Dewenter and Carsten Thies. 2005. Landscape perspectives on agricultural intensification and biodiversity – ecosystem service management. *Ecology Letters*, Volume 8 Issue 8. Pages 857-874.  
<http://onlinelibrary.wiley.com/doi/10.1111/j.1461-0248.2005.00782.x/full>.
- Washington State Department of Ecology. 2007. TMDL for the Walla Walla Basin.

The Watershed Company, BERK, and the Walla Walla Basin Watershed Council. September 2014. Shoreline Analysis Report for Shorelines in Walla Walla County and the Cities of Walla Walla, Prescott and Waitsburg. Prepared for Walla Walla County.

The Watershed Company and BERK. June 2015. Draft Cumulative Impacts Analysis for Walla Walla County's Shoreline Master Program. Prepared for Walla Walla County.

Wenger, S. 1999. A review of the scientific literature on riparian buffer width, extent and vegetation. Office of Public Service and Outreach, Institute of Ecology, University of Georgia, Athens, Georgia.

Welsch, David J. 1991. Riparian Forest Buffers – Functions for Protection and Enhancement of Water Resources. NA-PR-07-91. [Broomall, PA:] U.S. Dept. of Agriculture, Forest Services, Northern Area State & Private Forestry

DRAFT