THE TUNK WATERSHED GROWTH RATES COMPARED TO THE COUNTY OVERALL, AND IN-TIME, IN-PLACE MITIGATION TO ACHIEVE NET ECOLOGICAL BENEFIT

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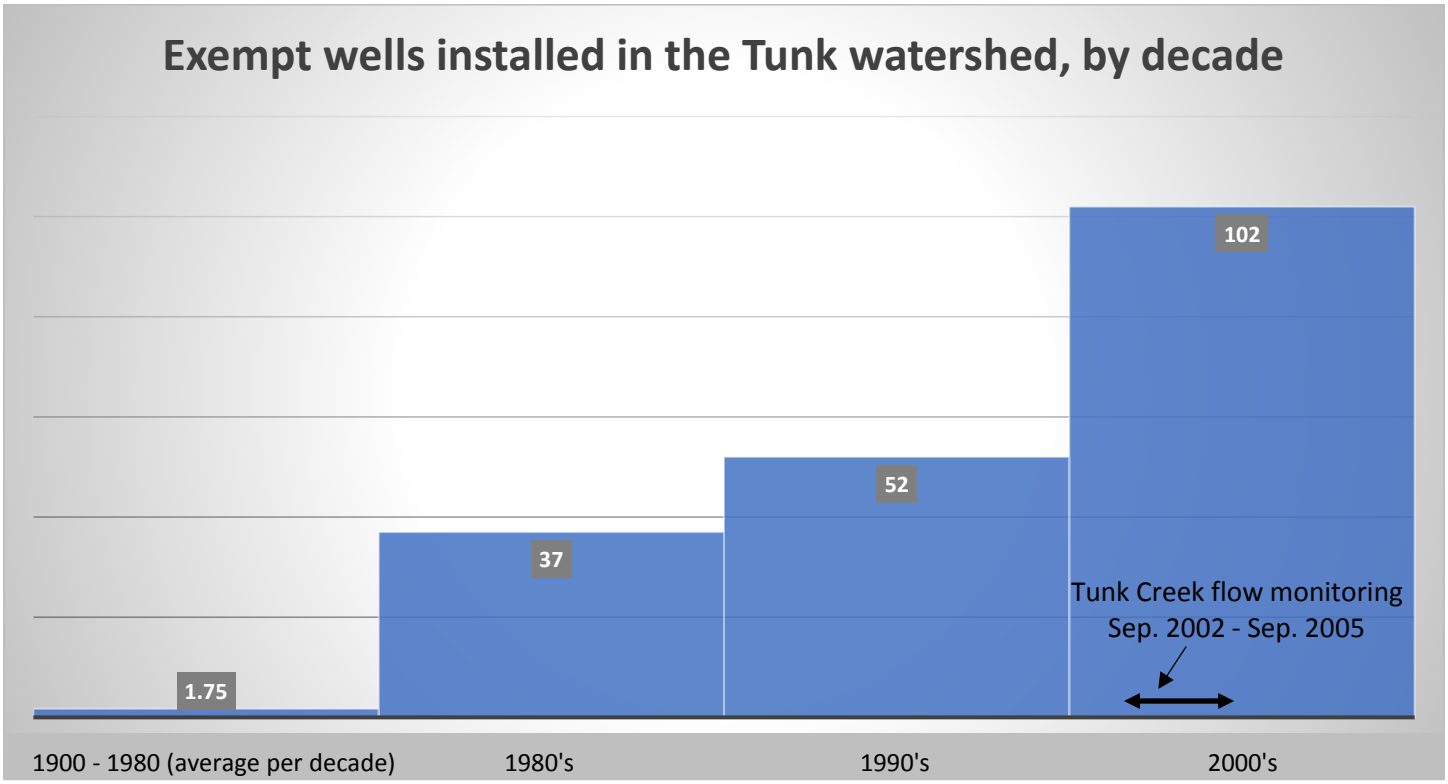
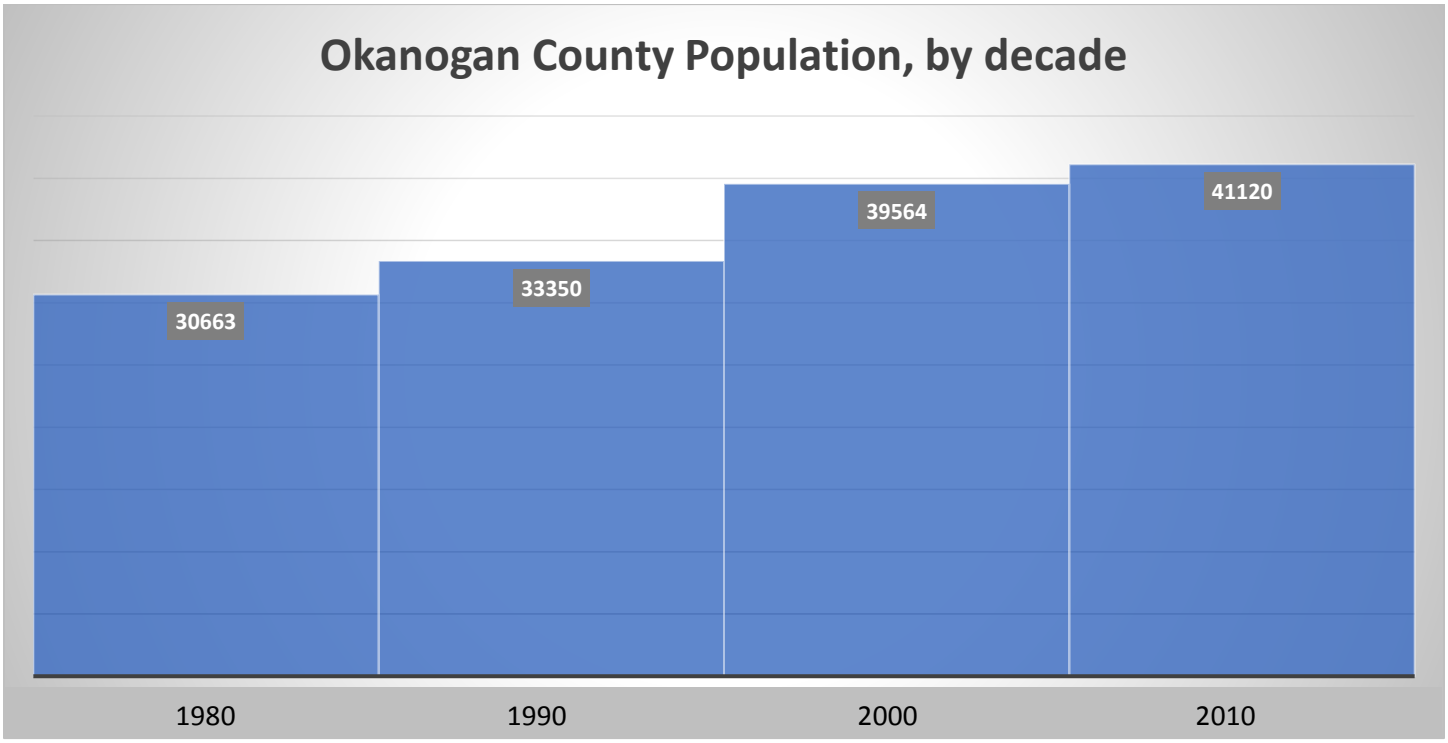
During the May 2019 meeting of the WRIA 49 Planning Unit, it was agreed that, in order to identify what mitigation is required to achieve 'Net Ecological Benefit' (NEB), it is important to identify where future growth will occur. As discussed below, the history of growth in the Tunk watershed has far outpaced growth rates in the county as a whole, threatening vital aquatic resources and water availability.

The 2009 Okanogan Watershed Plan and its supporting documents (the "Plan") contain much of the information needed to identify the Tunk Watershed as severely limited in the water resources needed to support future development. Unless otherwise noted, the following discussion uses information taken from the Plan. The Plan identifies the water balances derived by Entrix as being appropriate for use when assessing the effects of water withdrawals. In the case of the Tunk watershed, the water balance involves 13.34 inches of average annual precipitation, 96% of which is lost to the atmosphere through evapotranspiration (i.e., the portion of precipitation returned to the atmosphere through evaporation and by transpiration of plants*)* and 4% of which is the yield of the watershed to the Okanogan River. This amounts to an average watershed discharge of 3.14 cubic feet per second (cfs), with summer low flows reaching as little as 0.1 cfs.

The Plan provides excellent details on the limitations imposed by geology on the natural storage capacity for precipitation delivered to the Tunk watershed. Notably, due to underlying geology, groundwater storage is limited to the unconsolidated glacial drift that covers 65% of the watershed and is generally less than 100 ft. deep. What the Plan was not able to address was the rapid development underway at the time that the supporting information was collected (see the chart below – information derived from the Washington Department of Ecology ('Ecology') well database). Streamflow was monitored for three years in the first half of the 2000's – the decade that development was proliferating in the Tunk watershed.



According to Ecology's Water Rights Tracking System, between 1900 and 1980, 14 wells were recorded in the Tunk watershed within Township 35 North and Ranges 27, 28 and 29. Between 1980 and 2010, the total number of exempt wells in that area increased to 205 – representing an increase of more than 1,360%. In the same period, the population of Okanogan County increased by 34% (see chart below). Clearly, development has disproportionately affected the Tunk watershed compared to the county as a whole.



ESSB 6091 mandates a watershed plan in WRIA 49 that mitigates for the effects of future exempt wells, and that Ecology must determine that actions identified in the plan will result in a net ecological benefit to instream resources. In its 'Interim Guidance for Determining Net Ecological Benefit', Ecology's interpretation is that mitigation measures should support the recovery of threatened and endangered salmonids. As noted in their guidance*: 'Information on local conditions is crucial to understanding how to achieve NEB for individual watersheds. NEB evaluations should make use of available information on watershed-specific factors including: hydrogeology, stream flow conditions, fish populations and life histories….'*

Tributaries such as the Tunk are vital to the survival and recovery of steelhead in the Okanogan subbasin. The habitat they provide is typically flow-limited. The figure below, taken from the Colville Tribes' 2018 Okanogan Subbasin Steelhead Spawning Abundance and Distribution report illustrates the importance of lower Tunk Creek for spawning habitat. This indicates that, to comply with ESSB 6091, further development in the Tunk watershed needs to rely on actions within the watershed that offset consumptive domestic water use during the same time that they occur.

Until metering of wells and septic inputs measure actual consumptive use, required mitigation must be estimated. It is argued that most of the water withdrawn by exempt wells is used non-consumptively. That may be correct for in-house usage, however, outdoor watering is highly consumptive. Only wasteful practices allow applied water to percolate past the root zone and return to the groundwater.

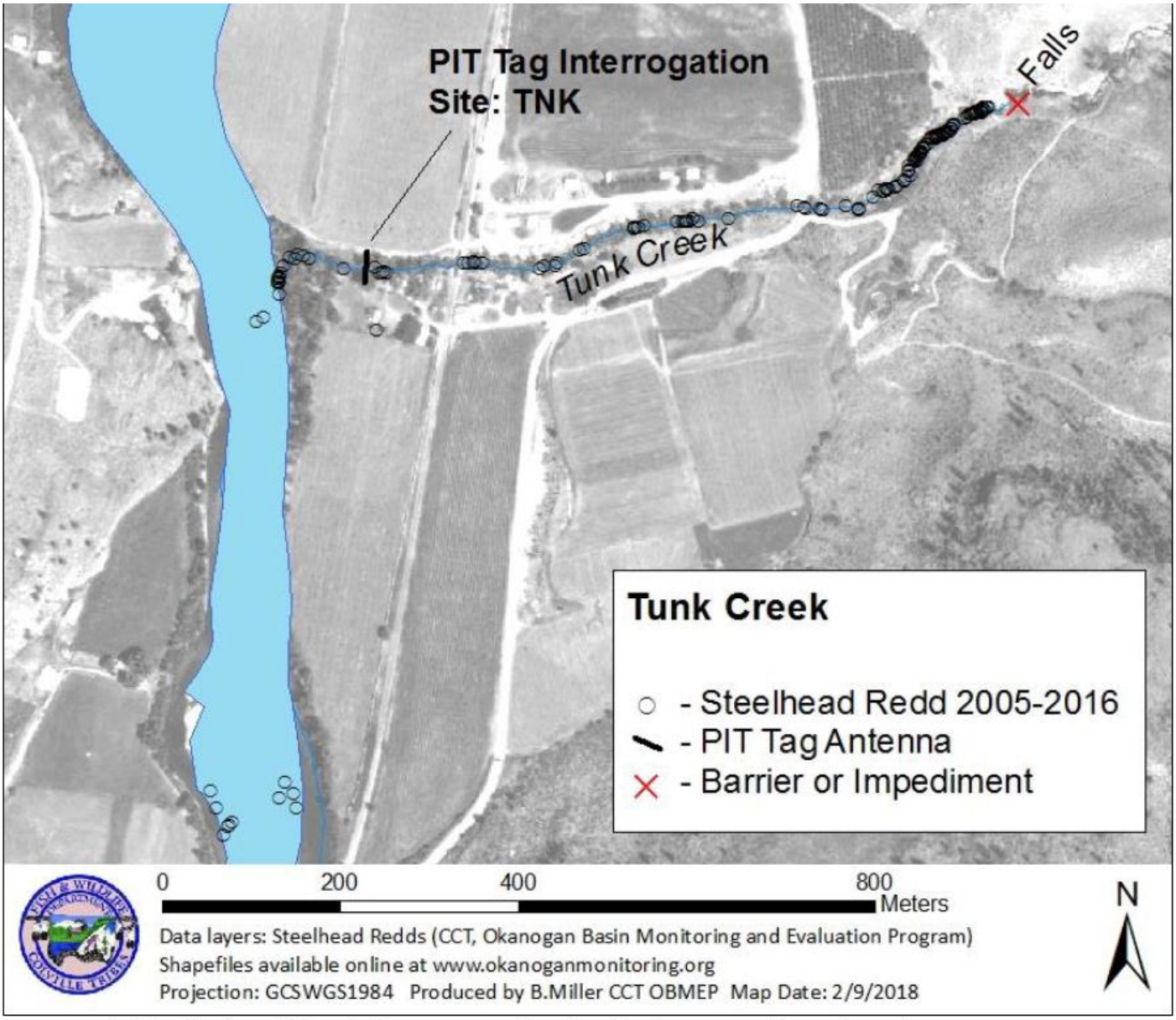


Figure 28. Spatial distribution of historical summer steelhead redds documented in Tunk Creek.

There is no reasonable rationale to rely on the assumption of insignificant amounts of outdoor usage from exempt wells in lieu of actual measurement. Application rates of 2.1 gallons per minute – about the rate of an ordinary sprinkler - would consume the allowed 3,000 gallons per day. During the growing season, at least 90% consumption due to evapotranspiration should be added to mitigation for year-round consumptive in-house use, and, to achieve Net Ecological Benefit, each future exempt well should be mitigated in 'time and place' accordingly.