

Chapter 9

Cumulative Impact Analysis

Background

RCW [redacted] requires that local shoreline master programs (SMPs) updated to meet the new guidelines require a cumulative impact analysis to determine if the proposed regulations will result in no net loss of shoreline function.

This analysis represents the culmination of nearly four years of effort to review, update and prepare a regional Shoreline Master Program for the cities of Oroville, Tonasket, Omak, Okanogan, Brewster and Pateros and the towns of Twisp and Winthrop within Okanogan County.

The analysis builds upon data collected and analyzed during the inventory and characterization of the shorelines within the entirety of Okanogan County as well as the shoreline designation process and the County's and several city and towns efforts to update local comprehensive plans and zoning codes.

There are two significant parts of the analysis, separated in the same manner as the characterization: planning, physical and administrative factors such as zoning, parcel sizes and locations and types of structures (e.g. docks, bridges, pipelines, buildings), etc...; and, biological factors including the resources and stressors that affect shoreline function. As in the Characterization (see Chapter 4), the cumulative impact analysis was conducted through the combined efforts of Highlands Associates and ENTRIX, with Highlands the lead on planning factors and ENTRIX the biological processes (complete ENTRIX Report in [Appendix \[redacted\]](#)).

Highlands work on the planning factors was focused on developing projections for build-out and future land uses within the shoreline areas of Okanogan County and its incorporated municipalities. In order to complete this work a set of assumptions was developed and used to guide decisions about where and what type of development would occur in the county. The assumptions were subject to review by members of both the Technical and Shoreline Advisory Groups.

ENTRIX work focused on using the results of Highlands work to run a model to determine the impacts of development on shoreline functions under the proposed shoreline regulations.

Built-Out and Future Land Use Projections

Original Assumptions

The build-out and future land use projections prepared by Highlands Associates went through several iterations as changes were made to the proposed draft County Comprehensive Plan and Zoning Code, more current parcel and land use data became available and final revisions were made to the proposed shoreline designations and regulations. In general each parcel in shoreline

jurisdiction within the county was assigned a build-out number and future land use using the following assumptions.

The build-out number represents the potential number of parcels that could be created under the proposed shoreline designations and regulations. Future land use codes were assigned based on several factors including comprehensive plan land use designation, existing land use patterns in the area, critical areas and access. Details on the original assumptions used to assign the build-out number and future land use code follow.

1. All parcels lying entirely or partially within the “maximum” definition for shoreline jurisdiction (those lands lying 200 feet landward on a horizontal plane from the OHWM or the 100-year floodplain, whichever is greater, plus associated wetlands). Okanogan County provided the parcel and shoreline jurisdiction boundaries used in the analysis.
2. All parcels lying entirely within mapped floodway areas were assigned a build-out of zero (0). Assumption relies on the fact that federal and state flood hazard reduction statutes generally limit all development in areas designated by FEMA as floodways.
3. All parcels located in the “Conservancy”, “Natural” and “Aquatic” designations were generally assigned a build-out of zero (0). This assumption is based on the fact that all of the parcels designated “Conservancy” are publically owned or have been placed in a conservation easement or platted open space or common area, however some privately owned parcels were assumed to be able to develop; all parcels designated “Natural” are generally publically owned or unbuildable by virtue of location (islands), however some are private owned and could potentially be developed (most are parcels outside of the Methow Review District and lie entirely within the 100-year floodplain); and, all parcels designated “Aquatic” lie below the ordinary-high-water-mark and are subject to the Shoreline Management Act limitation on overwater construction.
4. All parcels located entirely within the mapped 100-year floodplain were assigned a build-out of zero (0).
5. All parcels with existing developed uses (residential, recreation, commercial or industrial – based on Assessor’s Use Codes) less than twice the minimum lot size for the shoreline designation where they are located are assigned a build-out of zero (0). The assumption is that the parcel was already developed and impact associated with existing development was part of the baseline shoreline characterization and functionally classification.
6. All parcels without existing developed uses (based on Assessor’s Use Codes) less than twice the minimum lot size for the shoreline designation where they are located are assigned a build-out of one (1). Assumes all such parcels are buildable.
7. All parcels greater than or equal to twice the minimum lot size for the shoreline designation where they are located were identified then build-out assigned using the following assumptions:
 - a. Those parcels with less than twice the minimum shoreline frontage requirement for the shoreline designation where they are located were assigned a build-out of one (1)

if the parcel was undeveloped (based on Assessor Use Codes) or a zero (0) if the parcel was developed (based on Assessors Use Codes).

- b. Those parcels with greater than or equal to the minimum shoreline frontage requirements for the shoreline designation where they are located required that shoreline frontage to be measured (using 2006 aerial photos registered to the county parcel layer) and the minimum lot size determined then build-out assigned based on existing shoreline development and the potential number of parcels that could be created based on a combination of minimum frontage and minimum lot size requirements.

For example a 20 acre parcel is located in a shoreline designation that requires a 5 acre minimum lot size and a 200 foot minimum frontage. The parcel has an existing residence (located within shoreline jurisdiction) and 450 feet of shoreline frontage. While the minimum lot size requirement would allow up to four lots to be created, the shoreline frontage requirement limits the total lots to two (2) within shoreline jurisdiction. This example parcel would have a build-out of one (1) for the undeveloped lot that could be created.

8. All parcels were assigned a future land use code based on adopted City, Town or County comprehensive plan land use designations.
9. Future land uses were categorized as low, medium or high intensity with land uses including residential, commercial, industrial, agriculture, resource, mixed residential/agriculture, mixed residential/commercial, etc..... using the following information (based on adopted and draft maps, aerial photos, personal knowledge and professional judgment):
 - a. Local comprehensive plan designation
 - b. Existing development patterns
 - c. Access to state or improved county roads
 - d. Existence of critical areas (primarily steep slopes, flood hazard and wetlands)

Modified Assumptions

These original assumptions were subsequently modified based on input from the Technical and Stakeholder Advisory Committees and local planners.

1. Only parcels lying entirely within the 100-year floodplain in the Methow Review District were assigned a build-out of zero (0) with those parcels lying entirely in 100-year floodplain elsewhere in the County assigned a build-out using the original assumptions.
2. Where local comprehensive plan designations and density standards conflict with shoreline designation requirements, the more stringent would apply. For example, the comprehensive plan designation allows 1acre lots, but the shoreline designation limits lot sizes to 5 acres, the shoreline lot size was used to assign build-out. Where the

comprehensive plan designation limits parcels to 20 acres, but the shoreline designations allows 1 acre lots, the comprehensive plan designation was used to assign build-out.

3. The proposed definition used to define the area of shoreline jurisdiction was changed to the “minimum” (200 feet on a horizontal plane from the floodway boundary). This change is only applicable to those areas with an official floodway on federal flood insurance rate maps.

Methodology

The methodology for generating the data used in the planning factors component of the cumulative impact assessment required that each parcel within shoreline jurisdiction in Okanogan County and the cities and towns therein, be coded with the following basic data:

- existing or proposed comprehensive plan land use designation (includes density and use information)
- existing or proposed zoning district (includes minimum lot size and allowable uses)
- existing ownership verified
- percentage of parcel in mapped floodplain
- existing platted common areas and open space parcels identified
- existing conservation easement parcels identified
- location within a city or town corporate limits
- location within an adopted (by the city or town) urban growth area
- proposed shoreline designation
- proposed minimum shoreline lot size
- proposed minimum shoreline frontage

Given the elapsed time between the beginning of the characterization process and the cumulative impact assessment (nearly 3 years) the most current parcel data from Okanogan County was imported for use in the analysis. As a result of subdivision and boundary line adjustment activities the number of shoreline parcels increased over that time period. In addition, Okanogan County began working on a new comprehensive plan with several different drafts with changing land use designation maps being released during the period of time the data for the analysis was entered. This created additional work as the new or modified parcels had to be individually examined and coded with the basic data noted above.

Once the parcel data was coded with the basic data and deemed complete (duplicates removed, data verified) the process then turned to assigning build-out and future land use codes using the assumptions described above. As the assumptions were changed additional iterations of assigning build-out and future land use codes were required.

The other aspect of the planning component of the cumulative impact analysis was the assignment of a future land use for each parcel. This data, along with the build-out numbers were provided to ENTRIX for use in their modeling of cumulative impacts on shoreline functions resulting from development under the proposed SMP regulations. The following table (4.1) provides a summary of the build-out numbers for each shoreline designation. Table 4.2 provides a summary of the types of development that are projected to occur on the buildout parcels.

Build-out Data Results for Winthrop

The following table summarizes build-out data by shoreline designation. See map on following page for graphic illustration of the following data.

Table 4.1

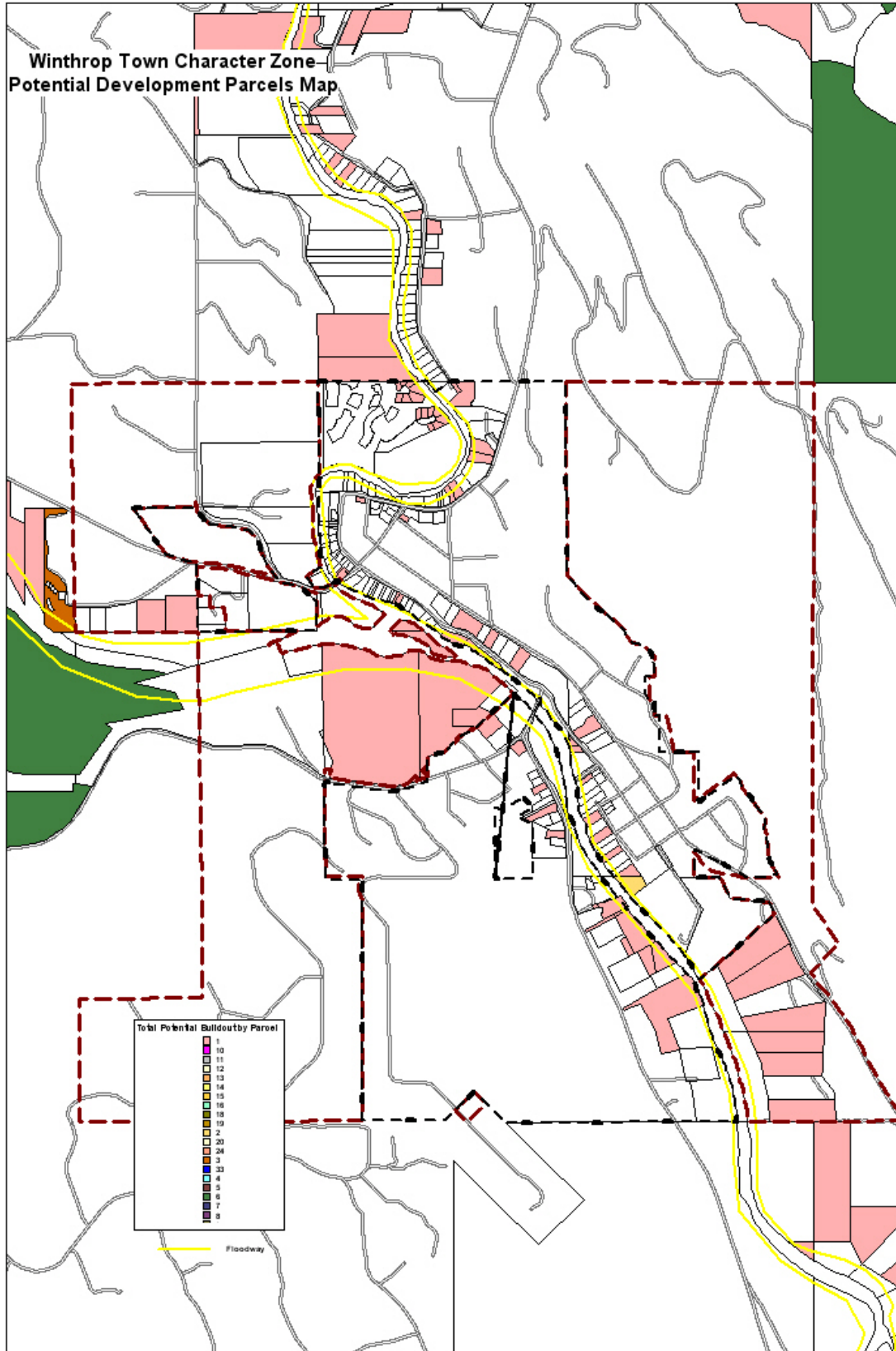
Shoreline Designation	# of Parcels ¹		# of Parcels Currently Developed ²		Potential Build-out ³	
	Town	UGA	Town	UGA	Town	UGA
Aquatic	N/A	N/A	N/A	N/A	N/A	N/A
Natural	2	0	2	0	0	0
Conservancy	0	0	0	0	0	0
Riverine/Lacustrine	0	6	0	5	0	1
Rural Resource	0	0	0	0	0	0
Rural Residential	0	0	0	0	0	0
Shoreline Recreation	2	7	2	5	0	2
Shoreline Residential	51	8	27	2	25	6
High Intensity	66	0	45	0	21	0
Urban Conservancy	7	7	7	7	0	0
Urban Conservancy/High Intensity	32	0	27	0	5	0
Urban Conservancy/Shoreline Residential	22	0	17	0	5	0
Urban Conservancy/Shoreline Recreation	1	1	1	0	0	1
Totals	183	29	128	19	56	10

¹ -includes all existing parcels (January 2009 County data) with any portion lying within shoreline jurisdiction

² -includes all parcels with Assessors Use Codes that indicate existing development, public lands, land under conservation easements and platted common areas or open space.

³ -represents potential new parcels under proposed shoreline regulations.

Okanogan County Cities and Towns Regional Shoreline Master Program
Town of Winthrop Master Program
April 2010 Draft



A review of the data in the table finds that at present approximately 70% and 65.5% of shoreline parcels in the town limits and UGA respectively are developed in some form and that the potential exists under the proposed shoreline regulations for an additional 56 parcels in the town and 10 in the UGA in areas subject to shoreline jurisdiction. The build-out analysis shows that 45% of the potential parcels within the Town are within areas designated as Shoreline Residential, 38% High Intensity, 9% Urban Conservancy/High Intensity and 9% Urban Conservancy/Shoreline Residential. Potential parcels in the UGA are primarily focused in areas designated as Shoreline Residential (60% of potential parcels). The shoreline regulations as proposed could allow for the number of parcels in shoreline jurisdiction to total over 278 (in Town and UGA) if build-out occurs under the assumptions used for this analysis.

The actual number of parcels created and land uses to be developed will vary depending on a range of factors, including location and market forces. Therefore, this analysis assumed the densest scenario of development in order to model the worst case scenario in terms of impacts. Based on regional growth projections and the current economic stagnation, it is highly unlikely that the projected build-out will be achieved in the foreseeable future. The analysis also did not take into account the use of clustered development, planned development, density bonuses, or development standards that are emerging such as low-impact development and green technology that may alter development impacts for the shoreline. These types of development tools will provide additional shoreline protection through open space plans, covenants and restrictions.

Table 4.2 shows that 39% of the new development will be high intensity commercial in nature, 47% high intensity residential, 11% medium intensity residential, 2% high intensity recreation and 2% medium intensity agriculture/residential.

Table 4.2
Build-Out by Future Land Use and Shoreline Designation

Shoreline Designation	High Intensity Ag/Residential	High Intensity Commercial	Irrigation High Intensity /WWTP Dam/Public/	High Intensity Recreation	High Intensity Residential	Low Intensity Agriculture	Low Intensity Forest	Low Intensity Recreation	Low Intensity Resource	Agriculture Low Intensity Residential/	Low Intensity Residential	Medium Intensity Commercial	Medium Intensity Recreation	Medium Intensity Resource	Medium Intensity Agriculture Residential/	Medium Intensity Residential	TOTALS
Aquatic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Natural	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Conservancy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Riverine/Lacustrine	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Shoreline Recreation	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	2
Shoreline Residential	0	0	0	0	25	0	0	0	0	0	0	0	0	0	0	6	31
High Intensity	0	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	21
Urban Conservancy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Urban Conservancy/High Intensity	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
Urban Conservancy/Shoreline Residential	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	5
Urban Conservancy/Shoreline Recreation	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Totals	0	26	0	1	31	0	0	0	0	0	0	0	0	0	1	7	66

Scientific Analysis – Impact on Shoreline Function

The next step in the process required ENTRIX to enter the build-out and future land use data into the computer model constructed for the characterization process (see Chapter 4 – Characterization) and develop formulas to represent the proposed regulations (see Chapter 8 – Regulations).

The science team reviewed and discarded a number of variables to have the model consider but in the end decided to generally use a worst case scenario – every parcel identified as having build-out potential would be developed with each parcel using the maximum lot coverage (developed area). The team also assumed that required setbacks and buffers would be enforced.

The results of the analysis finds that the average AU functional score for the Winthrop Town Character Zone (see Chapter 4 – Characterization) will remain a **3**, meaning no net loss of shoreline function. Please refer to **Appendix ___** for the data summaries prepared by ENTRIX.

Summary and Recommendations

The results of the cumulative impacts analysis show that even under a worst case scenario (assuming proposed buffers are enforced), the shorelines of the Methow and Chewuch Rivers within the Winthrop Town Character Zone will maintain their current function with low condition and high asset values. However, it is possible as new development occurs in presently undeveloped areas and existing developed areas are redeveloped under the new regulations, that a combination of restoration and enhancement will result that can improve the condition of the shoreline areas in some places.

It is recommended that the Town:

- encourage the replacement of non-native species of vegetation with native species as practical in all shoreline development projects
- require establishment of native shoreline vegetation in areas presently degraded as part of all shoreline development projects