5. RESOURCE LANDS, CRITICAL AREAS, AND SHORELINES

A growing body of state and federal laws mandate that the local governments identify and protect certain types of land uses and environmentally sensitive areas. The State of Washington's Growth Management Act (GMA) requires that all counties, cities and towns classify and designate resource lands and classify, designate, and regulate development in critical areas. The Shoreline Management Act of 1971 mandated that the local governments with shorelines of the state or shorelines of statewide significance prepare and enforce shoreline master programs, comprised of a comprehensive plan and zoning ordinance for shoreline areas; and it is also required that counties and incorporated communities with identified flood hazard areasadopt and enforce flood damage prevention ordinances. While the federal government has not established regulations directly affecting local land use planning, there is a body of law that regulate development in wetlands, construction in flood hazard areas identified on federal Flood Insurance Rate Maps and impact development through cultural resources and clean air and water regulations. This section of the land use element is intended to ensure that Twisp is meeting the requirements of the Growth Management Act, Shoreline Management Act and both state and federal flood hazard and wetlands regulations.

Area residents are concerned about their "quality of life" and the environmental attributes that contribute to the rural lifestyle. Resource Lands, Critical Areas, and Shorelines all play a significant role in the "quality of life" enjoyed by people living, working or playing in Twisp and the Methow Valley. Therefore, this section of the plan plays a crucial role in maintaining community desires into the future.

GROWTH MANAGEMENT ACT

In 1990, the Washington State Legislature passed the Growth Management Act (GMA) in response to rapid growth that was occurring in certain areas of the state. Counties that are either required or have opted to plan under GMA have a wide array of planning issues to address. Jurisdictions in counties that aren't required to plan under the Act or have not chosen to plan are still required to address certain issues. Okanogan County and thus Twisp fall within the latter category; the Tribes are exempted, although, fee lands within the boundaries of the Reservation are subject to the Act.

In 2000, the State Legislature amended the Growth Management Act to include new rules for requiring the use of Best Available Science in critical area policies and regulations. Specifically, the new regulations state:

> "Counties and cities must include the best available science when developing policies and development regulations to protect the functions and values of critical areas and must give special consideration to conservation or protection measures necessary to preserve or enhance anadromous fisheries."

The Town completed updates to this section of the Comprehensive Plan and Chapter 18.60 Critical Areas of the Twisp Municipal Code in 2009 in order to integrate Best Available Science. This 2019 update is required to maintain compliance with the provisions of the Growth Management Act.

SHORELINE MANAGEMENT ACT

Enactment of the Shoreline Management Act in 1971 (RCW 90.58) reflected a growing concern among the residents of Washington State with the adverse effects of unplanned and uncoordinated development on the state's shorelines. The Shoreline Management Act established a cooperative program of shoreline management between local government and the state. Local government has the primary responsibility for initiating and administering the regulation of shoreline development. The State Department of Ecology acts primarily in a supportive and review capacity with primary emphasis on ensuring consistency between local policy and provisions of the Act.

In Twisp, the Methow and Twisp Rivers are designated "shorelines of statewide significance", and thus, the Town is required to give priority to statewide objectives and goals enumerated in RCW 90.58.020 (as it exists or may hereinafter be amended). Twisp regulates its shorelines through a Shoreline Master Program (SMP) initially adopted in 1991. In 2003, the State legislature enacted new shoreline rules that required all such Programs to be updated by 2014. From 2006 through 2010 the Town worked along side Okanogan County and the other cities and towns on a grant funded process which resulted in a Regional Shoreline Master Program. The regional program was then extensively reviewed, revised and customized for Twisp by the Town Planning Commission prior to its formal adopted by the Town and Department of Ecology in 2012.

The main purpose in including a reference to the shorelines in this section of the land use element is to provide a link between the comprehensive land use plan and shoreline master program.

GENERAL POLICIES FOR RESOURCE LANDS, CRITICAL AREAS AND SHORELINES

The following policies are intended to guide decision-making regarding resource lands, critical areas and shorelines in the Twisp area:

Policy 1 – Agree to develop plans, programs and intergovernmental cooperation aimed at ensuring resource lands, critical and shoreline areas are not subject to unnecessary impacts.

Policy 2 – Cooperatively develop strategies for meeting the requirements of the Growth Management Act for the Planning Area.

Policy 3 – Coordinate and cooperate on the review and revision of critical areas ordinances to reflect changes in local, state and federal regulations.

Policy 4 – Cooperate on identification of resource lands and critical areas. This would simplify the administration of existing ordinances consequently promoting compliance and resource protection.

Policy 5 – Agree that development in critical areas outside of shoreline and floodplain areas should be subject to review under the State Environmental Policy Act to ensure disclosure of potential environmental impacts.

Policy 6 – Agree to inform the public of resource protection and permitting requirements for resource lands, critical areas and shorelines using news media and educational materials available from local, state and federal agencies.

Policy 7 – Agree to provide for reasonable use of developable lands and to use enhancement measures to mitigate effects of development.

Resource Lands

As identified under GMA, natural resource lands include three distinct categories to be classified and designated: agricultural, forest lands, and mineral resource lands. The goals and policies for Resource Lands follows.

Resource Land Goals

The Comprehensive Planning Goals for resource lands of long-term commercial significance are:

Goal 1. Respect and support existing agricultural operations, both within and surrounding the Town and its projected growth area, while protecting the health, safety and welfare of those persons living, working or recreating within areas targeted for future growth.

Goal 2. Encourage mineral development in areas where it can be accommodated with historic, present, and projected land use patterns for the area, while recognizing that mineral development can only occur where economically viable deposits exist.

Resource Land Policies

The policies intended to implement the resource lands goals are:

Policy 1. Zoning within the Town shall treat agricultural land as a non-conforming use that can continue but cannot expand or be substantially changed.

Policy 2. The Town shall encourage the establishment of sufficient buffers for proposed non-agricultural activities that adjoin existing agricultural uses in order to protect the public health, safety and welfare.

Policy 3. Existing or proposed urban uses within the incorporated boundaries of the Town shall be given acknowledgement and priority consideration over agricultural uses while appropriate and effective buffers should be encouraged between such uses to protect the health, safety and welfare of citizens choosing to live, work and play within the Town.

Policy 4. The Town shall encourage and strictly enforce the control of noxious weeds throughout its jurisdiction.

Policy 5. The Town shall encourage the use of “best management practices” (defined by the particular agricultural industry) on all agricultural lands as a means to reduce potential conflicts with adjoining landowners, particularly in those areas where agricultural and non-agricultural uses presently co-exists.

Policy 6. The Town shall recognize and support the multiple uses and beneficial role agricultural resource lands play in the provision of open spaces, enhancement of wildlife habitat and the rural qualities prized by the community.

Policy 7. The Town shall encourage growth where urban services are available and where such growth has a least potential for impact on any lands identified as agricultural lands of long-term commercial significance.

Policy 8. The Town shall provide opportunities for affected citizens to be involved in the preparation of plans and regulatory programs intended to protect natural resources, including agriculture.

Policy 9. Residential and commercial development shall take priority over any proposed mineral exploration of development.

Policy 10. In the event that substantial mining development occurs, the Town shall incorporate the preceding goal and these policy statements into regulations specific to mining exploration, development and reclamation.

Policy 11. The Town shall coordinate with relevant county, state and federal entities in at least the three following areas:

- Access to mineralized lands
- Opportunities for development of mineralized lands
- Reclamation of the land according to an approved site reclamation plan

Policy 12. Lands that are already developed for urban uses shall be protected from the hazards of mine development.

Policy 13. Lands being considered for annexation that have known mineral development sites shall include zoning designations that would allow the use or potential use to take place while providing protection for urban uses (including gravel or soil extraction).

Agricultural Lands of Long-Term Commercial Significance

1. Classification

Twisp uses six criteria to classify agricultural lands of long-term commercial significance in the Urban Growth Area outside of the corporate limits. For the sake of consistency, this classification scheme is based on Okanogan County's original process to determine the extent of agricultural lands of long-term significance within and around the community.

In order to be classified as Agricultural Lands of Long-Term Commercial Significance, land must meet as least four of the following six criteria:

- Land is currently in agricultural use.
- Land has one or more of the following improvements in place:
  - Irrigation facilities (public or private)
  - Drainage facilities (public or private)
  - Fencing, stock watering, or other physical improvements that enhance the land's suitability for commercial agricultural production
- Land is enrolled in Agricultural Open space taxation program.
- Land is surrounded by lands primarily in agricultural use with few non-farm commercial, industrial or residential uses and is not located in areas with clear potential for more intense uses of land.
- Land is not located within areas identified for urban growth or as a future service area (or similar designation) in official city, town, or county comprehensive plans.
- Land is not located within an area served by domestic sewer or domestic water service districts.

2. Designation

In applying the classification to the Twisp and its adopted UGA it has been determined that there are no parcels of land that meet 4 of the above mentioned 6 criteria, thus there are no agricultural resource lands of long-term commercial significance within the Town or Urban Growth Area.

Forest Resource Lands of Long-Term Commercial Significance

1. Classification

For the purposes of classification of Forest Lands for timber production and harvest, the Town of Twisp applied land grades 1 through 5 pursuant to WAC 458-40-530 (as it existed or is hereinafter amended), as forest lands of long-term commercial significance.

2. Designation

The Washington State Department of Natural Resources Private Forest Land Grading Productivity maps are used to designate Forest Resource Lands in Okanogan County. No forest resource lands of long-term commercial significance have been identified within the Town or UGA.

Mineral Lands of Long-Term Commercial Significance

1. Classification

A four-tiered classification scheme presented in a report by Alan Robert Grant to the U.S. Forest Service (May 3, 1982) is the basis for the five-tiered system developed by the Okanogan County GMA Mineral Resource Lands subcommittee to classify these resource lands within the county. The Okanogan County classification system, which is accepted by the Town, is based on the "likelihood of activity" which includes the following categories:

- Area I has very good potential for development of minerals of long-term commercial significance. These areas will see continued exploration activities and includes areas that have historic mineral resources, which include some identified and demonstrated reserves, with a very good potential for undiscovered reserves.
- Area II has good potential and includes areas geologically favorable with some identified reserves and good potential for undiscovered reserves.
- Area III has moderate potential and includes areas geologically favorable with some identified reserves and moderate potential for undiscovered reserves. Also included are areas where rock units of poor potential obscure underlying areas of good and very good potential.
- Area IV has fair potential and includes areas geologically unfavorable overall, but includes certain areas that require additional geologic investigation. Also included are areas where rock units of poor potential obscure underlying areas of moderate, good and very good potential.
- Area V has poor potential and includes areas that are geologically unfavorable with poor potential for undiscovered reserves.

2. Designation

In Okanogan County, mineral resource lands are mapped based on information from the following sources: U.S. Forest Service, U.S. Bureau of Mines, Landsat, Colville Confederated Tribes Geology Department, Washington State Department of Natural Resources, personal knowledge of the members of the Okanogan County GMA Mineral Resources Subcommittee and others.

Mineral resource lands of long-term significance in Okanogan County, including Twisp and its urban growth area have been designated according to the above classification criteria. West of the Okanogan River, the designation for the Greater Omak Area is IV, Fair Potential. East of the river, on the Reservation, the designation is Area III, Moderate Potential. The Mineral Resource Lands Designation Map for Okanogan County is located at Okanogan County Department of Planning and Building.

Critical Areas

Classifying, designating and regulating "critical areas" is a required task for all cities, towns, and counties in the State. Critical areas include wetlands, aquifer recharge areas, frequently flooded areas, fish and wildlife habitat conservation areas, and geologically hazardous areas, which include erosion hazard, landslide hazard, mine hazard, seismic hazard and volcanic hazard areas. Local governments may also choose to address other critical areas such as wildfire hazard areas or river channel migration zones.

During 1993 and 1994, the Town of Twisp and other Okanogan County communities participated in a coordinated planning effort that included broad citizen participation in order to comply with the critical areas provisions of the Growth Management Act (GMA). In 2001, the legislature adopted new requirements for consideration of "best available science" in the classifying, designating and regulating of critical areas. Again, the local jurisdictions joined together to craft locally and regionally relevant policy for meeting GMA requirements. In an attempt to maintain reasonable consistency among the different municipalities and Okanogan County, information that was collected in these joint planning activities is used in this Plan for the management of critical areas.

The Town has used shoreline and conservancy overlays, in combination with development standards set forth in the City's Shoreline Master Program, Flood Damage Prevention and Zoning Ordinances, to regulate development in critical areas. In the past, these largely served to cover critical areas requirements. Upon review, however, it appears development may occur in some critical areas without the additional consideration required under GMA. The goal, policies, classifications and designations contained in this Comprehensive Plan are intended to support the use of best available science in regulating critical areas through a comprehensive overlay. Maps of critical areas within the Town were have been prepared with data from the Okanogan County Office of Planning and Development, Natural Resource Conservation Service, State Departments of Natural Resources, Ecology and Fish & Wildlife, Federal Emergency Management Agency, U.S. Fish & Wildlife Service and other sources using the most current and best data available. The maps, included in the Map Appendix to this Plan, depict the classifications and designations described herein. The maps are not specific as show known and potential critical areas based on a variety of data with varying degrees of resolution. As such the classification and designation of new sites as data is made available is implicit in the goals and policies herein.

Goals for Critical Areas

Goal 1. Achieve and maintain compliance with the Washington State Growth Management Act, as currently exists and as may be amended in the future.

Goal 2. Avoid costly litigation that may occur as a result of non-compliance with state and federal laws.

Goal 3. Plan for a healthy and safe community through the wise management of critical resources.

Goal 4. Use Best Available Science in classifying, designating and regulating Critical Areas within the Town of Twisp.

Goal 5. Provide flexibility in critical areas regulations, recognizing that the Growth Management Act encourages development within cities in order to limit the geographic extent of human impacts.

Goal 6. Protect the aquifer recharging functions of land located within and adjacent to the Town.

Goal 7. Maintain a high standard of quality for both groundwater and surface water resources.

Goal 8. Increase and maintain awareness in the community of the roles and functions of various natural systems in maintaining water quality and quantity.

Goal 9. Recognize fish and wildlife habitat as an attractive amenity and the Town of Twisp and, protect its valuable role in the local and regional economy.

Goal 10. Ensure that the Twisp area experiences no net loss of the functions and values provided by its remaining wetlands.

Goal 11. Manage land use in such a way that flood damage potential is minimized and development that increases flood potential is avoided.

Goal 12. Avoid the loss of life and property due to development in areas determined to be geologically hazardous.

Policies for Critical Areas

Policy 1. Review and incorporate best available science into all critical areas regulations.

Policy 2. Use the following criteria to determine the best available science for developing and implementing critical areas regulations:

a. Meets the definition under WAC 365-195 (as it exists or is hereinafter amended). Such sources may include natural resource science, documented and verifiable research using valid scientific methods, and scientific reports that offer decision making processes and/or tools.

b. Regionally relevant and defensible. This includes scientific studies conducted within the region, specific to habitat and/or species known to exist in the region, and science generally accepted through past use.

c. Locally (sub-regionally) relevant. This includes science which is specific to the local area.

d. Isolated/Unique. Such sources would include studies of isolated or unique features, no adequately covered in larger scale scientific sources.

e. Anecdotal – Where recognized science does not adequately address a specific situation or location, anecdotal information which can be verified and documented by historic records, photos, or other means.

Policy 3. Any use and/or development proposals to the Town will be reviewed for best management practices for aquifer protection. Best Management Practices are defined in the Town of Twisp Development Standards Manual consistent with the requirements of the Eastern Washington Stormwater Manual.

Policy 4. The Town will venture to eliminate and/or assume ownership of wells within its water service area in order to better manage aquifer protection and utilization. However, it is acknowledged that water rights are associated with property ownership and the rights of private property owners will be respected.

Policy 5. Indiscriminate release of hazardous wastes or materials, regardless of their risk potential, should be discouraged through both examples set by the City and any educational means available as set forth in the City's most recent Wellhead Protection Program.

Policy 6. Develop and maintain a bibliography of best available science consistent with the criteria in Policy 2.

Policy 7. Update critical areas maps as new scientific information becomes available.

Policy 8. Discourage the release of hazardous wastes or materials, regardless of their risk potential, through setting an example and providing educational materials.

Policy 9. Shorelines, zoning, and all other pertinent regulations should appropriately limit impervious lot coverage and provide for adequate stormwater drainage.

Policy 10. When the Town is requested to comment on any land use applications or rezones outside the corporate limits, the critical areas classification criteria should be applied in developing comments for the particular development proposal.

Policy 11. Critical Areas classification criteria should be applied when annexations are considered the areas identified in any of the aquifer recharge classifications should be appropriately zoned and protected.

Policy 12. Upon discovery, those areas that have critical potential for recharge should be subject to limits on the construction of impervious surfaces and protection against ground and surface water contamination.

Policy 13. Critical areas classification criteria should be applied when annexations are considered, and any annexed areas should be appropriately zoned and protected.

Policy 14. Ensure that all Town staff (especially Public Works Personnel) are given the opportunity to learn how the Town can protect and enhance fish and wildlife habitat while using these areas as an opportunity to enhance Twisp's image as a unique and attractive community.

Policy 15. Look for opportunities to work with agencies, Tribes and non-profits on efforts to restore riparian habitat along the Methow and Twisp Rivers, particularly in those areas under ownership of the Town or other public entity.

Policy 16. Use management recommendations from the Washington Dept. of Fish and Wildlife in developing regulations that protect riparian habitat from further degradation respecting the limitations of existing lots and development.

Policy 17. New lots in subdivisions should allow for adequate open space for riparian habitat including setback areas as determined by the best available science.

Policy 18. Use the Priority Habitat and Species program, or other best available scientific information, to meet fish and wildlife habitat needs while providing options for property owners to effectively coexist with critical habitat.

Policy 19. Avoid the creation of unnecessary layers of bureaucracy through implementation of an efficient review system.

Policy 20. Incentives for the protection of wetlands should be incorporated into all land use ordinances and open space programs.

Policy 21. Existing and ongoing legally conducted activities in wetland areas should be allowed to continue, so long as further degradation does not occur however, expansion and/or redevelopment should not occur without plan review that includes restoration or mitigation measures.

Policy 22. Buffer zones should be established for wetlands that are based on the particular wetland functions and values but flexible enough for adjustment for specific situations.

Policy 23. Wetland alteration proposals should be approved only if no alternative is available. When no alternative exists, wetlands replacement or enhancement shall be used to mitigate impacts and should be based on the functions and values of the particular wetland being impacted.

Policy 24. The Town utilizes the *Washington State Wetland Rating System for Eastern Washington (as amended)* to categorize wetlands, determine buffer widths and the appropriate management of wetland areas.

Policy 25. Wetland areas in Town ownership should be managed to the highest standards while utilized as an interpretive element of the park system.

Policy 26. The flood damage protection ordinance should be amended to include any areas of local concern as they may be discovered and designated by the Town.

Policy 27. Provisions for development of frequently flooded areas of local concern should allow similar options for development as allowed under existing and/or model regulations for floodways and 100-year flood plains.

Policy 28. The City should require that areas identified as steep slopes must be subject to more extensive review and more stringent development standards than other areas.

Policy 29. Areas identified as Erosion Hazard Areas should not be developed unless it is demonstrated that the project is structurally safe from the potential hazard, and that the development will not increase the hazard risk.

Policy 30. Reasonable setback or design considerations for development on or next to an Erosion Hazard Area shall be established on a case-by-case basis.

Policy 31. Existing uses legally established in Erosion Hazard Areas should be allowed to continue while expansion of any existing use shall meet structural standards that ensure the safety of the project.

Policy 32. A run-off management plan or an erosion control plan should be required of anyone proposing to develop in an area identified as an Erosion Hazard Area, to reduce sedimentation problems.

Policy 33. Disturbance of an Erosion Hazard Area should require reseeding with native vegetation, to assist in stabilization of the area and to discourage the infiltration of invasive weeds.

Policy 34. Areas identified as Landslide Hazard Areas should not be developed unless it is demonstrated that the project is structurally safe from the potential hazard, and that the development will not increase the hazard risk.

Policy 35. A reasonable setback for development near a Landslide Hazard Area should be established on a case-by-case basis, based on the type of development proposed and the type and extent of Landslide Hazard present.

Policy 36. Should a mine hazard area be identified, the site should be noted on site plans for any development activity, a geotechnical report should be required to determine safety distances.

Policy 37. Development of a site that contaminated by previous mining activities should require the applicant to prepare and implement a reclamation plan, if the hazard is determined to be one constituting a significant hazard to health or the environment.

Policy 38. All development activities should be required to conform to the applicable provisions of the International Building Code that contains structural safeguards to reduce the risks from seismic activity.

Policy 39. No development should occur on any known active fault line that has the potential to cause severe damage to structures. A reasonable setback for development should be required on a case-by-case basis (based on the type and recent activity of the particular fault and the proposed development).

AQUIFER RECHARGE AREAS

In general, aquifer recharge areas are those areas that, due to the presence of certain soils, geology, and surface water, act to recharge ground water by percolation. Among these areas, some have a critical recharging effect on aquifers used for potable water. Aquifer recharge areas serve the vital function of replenishing groundwater resources that provide potable water, an essential life-sustaining element. Aquifers not only provide water for domestic use but influence water availability for fish, wildlife, recreation and agriculture in wetlands, lakes, rivers and streams. Groundwater contributes to these water bodies while they return the favor when groundwater supplies become depressed. This, in turn, lowers surface water levels, thus, risking the viability of those dependent on these water sources.

Aquifer recharge areas are defined as follows:

Aquifer Recharge Areas - Areas which, due to the presence of certain soils, geology, and surface water, act to recharge ground water by percolation.

Critical Aquifer Recharge Areas - A Critical Aquifer Recharge Area (CARA) is defined by the GMA as areas with a critical recharging effect on aquifers used for potable water[1].

In addition to the amount of water available for recharge, water quality is a crucial factor. Once ground water is contaminated it is difficult, costly and sometimes impossible to clean up. Preventing contamination is necessary to avoid potential physical harm to people, hardships and exorbitant rehabilitation and clean-up costs. Preserving aquifer recharge areas is also critical in the replenishing of the Town's ground water supply.

In urban areas, another benefit of maintaining aquifer-recharging capability is related to storm water management. Soil and vegetation tend to reduce runoff by slowing the velocity of water; thereby

1 - WSDOE Critical Aquifer Recharge Areas Guidance Document January 2005
Publication Number 05-10-028 p. 2

reducing erosion and potential flooding. As water velocity is slowed by vegetation and soil, it is more easily absorbed by permeable soil, providing a filtering function for various contaminants, e.g., heavy metals. This process serves to protect the water quality of surface waters. As the physical development of the Town increases, the need to treat storm water before it is discharged to surface water bodies also increases. This amounts to a costly endeavor. Consequently, reducing storm water runoff by collecting it onsite and using any natural means available, is desirable.

1. Classification

The Methow and Twisp Rivers, due to the presence of threatened or endangered steelhead, several salmon and bulltrout have been the subject of myriad studies and reports related to water quality, quantity and hydrology. However, there are no studies specifically related to aquifer recharge in Twisp.

In _____ of _____ the Town adopted an updated Comprehensive Water Plan as required by the Washington State Department of Health to comply with the federal Safe Drinking Water Act. The purpose of such a plan is to provide an organized approach to effectively protect drinking water supplies from contamination and includes a Wellhead Protection Plan (WHP).

An Aquifer Susceptibility Assessment is a key component of a WHP. Susceptibility is a qualitative measure of how quickly and how far groundwater must travel to reach a water source (well or spring). Such information is useful in determining the existence of Aquifer Recharge Areas, and the extent of regulation necessary to protect local aquifers. A map of the Wellhead Protection Areas for Twisp is included as Map CA-1 in the Map Appendix.

In addition to the Wellhead Protection Areas, it is generally acknowledged that the following areas have the potential to allow contaminates to enter the aquifer: rivers and creeks especially at their headwaters, wetlands, lakes and ponds, alluvial fans, and areas within the 100-year flood plain. These areas are usually lower in elevation than their surrounding landscape. Therefore, coupled with certain porous soil types as identified by the Natural Resources Conservation Service (NRCS) Web Soil Survey[2], these areas are considered to have the potential for allowing contaminates to enter the aquifer and should be afforded a higher degree of protection than other areas. The following three-level classification scheme is used to determine the level of protection necessary for land areas:

Critical Potential - Rivers, creeks, wetlands, lakes and ponds; and lands that have been specifically identified as critical recharge areas based on reliable scientific data. This classification also includes the following soils:

475 - Riverwash

558 - Water

High Potential - Lands adjacent to rivers, creeks, wetlands, lakes and ponds, including areas of the 100-year floodplain and soils that are shown to be excessively well drained and/or somewhat excessively well drained with Ksat values above 10^3 according to the 2009 Soil Survey. This classification includes the following soils:

2 - Data obtained from Web Soil Survey site January 2019.
3 - Saturated hydraulic conductivity (Ksat) refers to the ease with which pores in a saturated soil transmit water. The estimates are expressed in terms of micrometers per second. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Saturated hydraulic conductivity is considered in the design of soil drainage systems and septic

565 - Winthrop gravelly loamy sand, 0 to 15 percent slopes

Moderate Potential - Lands with soils that are moderately well drained or well drained[4] with a Ksat value above 10[5] in the 2009 soil survey. This classification includes the following soils:

301 - Johntom-Foggydew-Rock outcrop complex, 35 to 75 percent slopes

326 - Leavenworth silt loam, 0 to 3 percent slopes

341 - Lithic Haploxerepts-Kartar complex, 15 to 90 percent slopes

343 - Lithic Haploxerepts-Newbon complex, 15 to 45 percent slopes

433 - Owhi ashy fine sandy loam, 0 to 3 percent slopes

434 - Owhi ashy fine sandy loam, 3 to 8 percent slopes

435 - Owhi ashy fine sandy loam, 0 to 25 percent slopes, extremely stony

436 - Owhi ashy fine sandy loam, 25 to 45 percent slopes, extremely stony

437 - Owhi gravelly ashy fine sandy loam, 0 to 8 percent slopes

2. Designation

No aquifer recharge areas are known to have been mapped within the Town or surrounding planning area. Therefore, aquifer recharge areas in Twisp shall be designated as "potential" in accordance with the classification provisions. Because the classification focuses on areas where soil types provide the potential for recharge or for contaminates to enter the aquifer, protections shall be broad enough to preserve essential aquifer recharge functions and values.

Map CA II in the Map Appendix designates potential aquifer recharge areas using the preceding classification system. It is important to note that the map is only general in nature and is based on the soil characteristics from the 2009 Soil Survey and interpretation of FEMA Floodplain Maps. Map CA II is intended to show those areas where contaminates may enter the aquifer and/or surface waters more readily than other areas. Specific projects will require more detailed site analysis prior to development.

FREQUENTLY FLOODED AREAS

Frequently flooded areas are those that experience a general and temporary condition of partial or complete inundation of normally dry areas from the overflow of inland waters and/or the unusual and rapid accumulation of runoff of surface waters from any source. Such areas include the 100-year flood plain as defined and mapped by the Federal Emergency Management Administration (FEMA). Twisp's

tank absorption fields.
4 - based on drainage class per soil type 2009 Soil survey
5 - Saturated hydraulic conductivity (Ksat) refers to the ease with which pores in a saturated soil transmit water. The estimates are expressed in terms of micrometers per second. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Saturated hydraulic conductivity is considered in the design of soil drainage systems and septic tank absorption fields.

frequently flooded areas are associated with the Methow and Twisp Rivers. See Critical Areas Map III in the Map Appendix. These areas are regulated by the Town's flood damage prevention ordinance.

1. Classifications

Class I – The floodway of any river or stream as designated by FEMA; and draws, alluvials and flood channels that are not mapped by FEMA but are areas of local concern that have a historical reoccurrence of flood events characterized by significant damage from flood flows.

Class II – All areas mapped by FEMA as 100-year flood plain; and, those areas of local concern that experience recurrences of flooding that are characterized by damage due primarily to inundation.

2. Designation

The Town designates those areas of special flood hazard indicated on Map CA III and on the Flood Hazard Boundary Map/Flood Insurance Rate Map and Flood Boundary/Floodway Map, together with the accompanying Flood Insurance Study from Community Number 5301170875C, revised November 16, 2003. Where conflicts occur between Map CA III and the FEMA map, the more restrictive shall apply.

As information becomes available, the Town should pursue mapping of areas of local concern that have a tendency to flood, despite being outside the levee.

FISH AND WILDLIFE HABITAT CONSERVATION AREAS

Generally, the concept of fish and wildlife habitat is not thought of as a component to urban development, especially in small towns and cities located in rural areas. Fish and wildlife habitat is currently abundant in Okanogan County so why should the residents of such a small portion of the County be concerned? Cumulatively and incrementally, development of land for human purposes impacts various elements of a wide diversity of fish and wildlife habitat. Over the long term, many areas that may have played a significant role in the life-cycle of fish and wildlife may be irretrievably lost.

In order to reduce the cumulative impacts of future development on fish and wildlife, growth areas (including cities and towns) can be planned and developed in such a way that critical habitat components may be retained. While general habitat remains in agricultural and a variety of public lands, critical habitat areas that happen to fall within the path of growth need special consideration.

Fish and wildlife are public resources. Protection of fish and wildlife is generally accomplished through a range of land management practices and regulations, mainly focused on the habitat required to support various animal populations. In Washington, protection of fish and wildlife habitat is vested with the Washington Department of Fish and Wildlife (WDFW) and is achieved through the State Environmental Policy Act (SEPA), Growth Management Act (GMA), Forest Practices Act (FPA), Shoreline Management Act (SMA), and the actions of landowners and government agencies.

Fish and wildlife habitat conservation areas are typically home to species designated by federal or state government as endangered, threatened or sensitive. Federally designated species are those identified by NOAA Fisheries or US Fish and Wildlife Service as being in danger of extinction or likely to become endangered. Current listing of these species is available from NOAA or USFWS (See list of Federally Designated species in Appendix __). Species designated at the state level include those animals native to the state which WDFW has identified as being in danger of extinction, vulnerable, or declining and likely to become endangered or threatened in a significant portion of their range without cooperative

management or removal of threats. A current listing of species of concern in Washington state is found in Appendix __.

Fish and wildlife habitat areas vary considerably throughout the state and within jurisdictions. While some habitats, such as wetlands, shorelines, or streams, tend to be easily recognized, other areas, such as prairie, shrub steppe or urban open space, may not be as obvious. The Washington State Department of Fish & Wildlife (WDFW) has extensive mapping of sensitive habitat around Okanogan County included as a part of their Priority Habitat Species Program. These maps are used to generally designate fish and wildlife conservation areas. Review of these maps and related information reveals that the extent of priority habitat within Twisp and its Urban Growth Area consists primarily of the Methow and Twisp Rivers and associated riparian areas and shrub/stepp habitat surrounding the community that serves as winter range for the valley's mule deer population. The riparian areas associated with the rivers not only support the life cycle of salmonids but support myriad other species.

A riparian habitat area (RHA) is defined as the area adjacent to aquatic systems with flowing water (e.g., rivers, perennial or intermittent streams, seeps, springs) that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.

The Washington Department of Fish and Wildlife (WDFW) has developed statewide riparian management recommendations based on the best available science. Nearly 1,500 pieces of literature on the importance of riparian areas to fish and wildlife were evaluated, and land use recommendations designed to accommodate riparian-associated fish and wildlife were developed. These recommendations consolidate existing scientific literature and provide information on the relationship of riparian habitat to fish and wildlife and to adjacent aquatic and upland ecosystems. These recommendations have been subject to numerous review processes and provide a guide for the Town.

Protection of riparian habitat, compared to other habitat types, may yield the greatest gains for fish and wildlife while involving the least amount of area. Riparian habitat because it:

- covers a relatively small area yet it supports a higher diversity and abundance of fish and wildlife than any other habitat;
- provides important fish and wildlife breeding habitat, seasonal ranges, and movement corridors;
- is highly vulnerable to alteration;
- has important social values, including water purification, flood control, recreation, and aesthetics.

1. Classification

The town of Twisp is generally considered an area where urban development is expected and planned to occur. Portions of the urban growth area have low density residential development intermixed with shrub-step uplands. While these natural areas include important habitat for animal and bird species, there are vast contiguous properties in the rural areas of Okanogan County. Therefore, it is not intended that the Town limit development in this portion of its urban growth area. However, the Methow and Twisp Rivers and associated riparian areas in the Town and adjacent Urban Growth Area warrant protection. Following are descriptions of the Town's classifications for fish and wildlife conservation areas:

Riparian Habitat Conservation Areas.

With this classification, the Town recognizes that riparian habitat within Twisp and its urban growth area is likely to coincide with shoreline areas, flood hazard areas, wetlands and aquifer recharge areas. Riparian areas typically offer relatively contiguous habitat that is essential to a diverse array

of fish and wildlife species. Best Available Science seems to indicate that these areas are especially sensitive to pressures from urban development, and that they provide important habitat functions and values for anadromous fish.

Riparian Habitat Conservation Areas are defined as public or privately-owned lands adjacent to the Methow and Twisp Rivers that presently contain riparian vegetation.

Upland Habitat Conservation Areas.

With this classification, the Town recognizes that those upland areas within the defined Town limits and urban growth boundary, which are not otherwise designated as aquifer recharge areas, wetlands, or geologically hazardous areas, are frequently the most suited for human development. This classification is intended to take into account that upland habitats that support federal or state identified endangered, threatened or sensitive species, or any habitats which are identified as providing a high level of functions and values must be protected to the extent possible. However, in considering Best Available Science, this classification also is intended to ensure that development is not subject to burdensome regulation in those areas most suited to support it. Such areas shall include all portions of the Town and urban growth area where a development pattern is already established such that connectivity of native habitat has already been broken and protection of identified habitat areas is unlikely to provide particular benefit to any of the priority species identified by WDFW.

2. Designation

Fish and wildlife conservation areas are designated under the Washington Department of Fish and Wildlife Priority Habitat and Species Program. Priority habitats are considered to be priorities for conservation and management. Priority species require protective measures for their perpetuation due to their population status, sensitivity to habitat alteration, and/or recreational, commercial, or tribal importance. Priority Habitat and Species maps based on WDFW data depict habitat conservation areas (see CA IV Fish & Wildlife Habitat in the Map Appendix). However, it must be noted that populations and habitat systems are dynamic in nature. Therefore, site review should be used to verify the presence of a given habitat or species.

WETLANDS

Wetlands are transitional areas between water and land, where the water table is at or near the surface of the soil. Wetlands are characterized by certain plant types, wet soils, and water (the presence of which may change with the seasons or even from day to day). Some wetlands are easy to identify bogs, marshes, estuaries, and swamps are good examples of these. Others are less obvious, and may actually be dry during the summer months.

Washington uses the same definition for wetlands as the federal government. Under that definition, wetlands are:

…areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes bogs and similar areas. [RCW 36.70A.030(20)]

Some wetlands, such as swamps or marshes, are easy to identify, while others are less obvious and may actually be dry during the summer months.

In general, wetlands are areas where the soil is wet for a long enough period of time that:

- soils become depleted of oxygen, and
- wetland vegetation is more prevalent than upland vegetation.

All three of these characteristics must be present for an area to be considered a wetland (hydrology, soil type, and vegetation).

Why are Wetlands Important?

Wetlands act like sponges to absorb enormous quantities of water during heavy rainstorms and periods of flooding. The water retained by wetlands can significantly decrease peak river flows during storms, reducing the effects of flooding. Some of this water percolates from the wetland into the ground, where it replenishes groundwater. Where wetlands are located adjacent to streams, stored water is slowly released as surface water, which drains into streams and helps to keep stream flows continuous an important factor in maintaining habitat for fish.

Because the vegetation within a wetland slows the movement of the water, silt, and other particles drop out of the water and settle to the bottom. Certain pollutants and excess nutrients are also filtered from water that passes through the wetland. By reducing sedimentation and lowering pollutant and nutrient levels in rivers and streams, wetlands further protect fish habitats and improve water quality in streams, rivers, and groundwater.

Wetlands are nature's rich nurseries for fish and wildlife. About 85 percent of Washington's wildlife species use wetlands and their buffers for breeding and feeding. Waterfowl and other resident and migratory birds, many of which are popular targets for hunters, rely on wetlands for feeding and nesting grounds. Numerous plants, invertebrates, reptiles, amphibians, fish and mammals also depend on the biologically rich environment of a wetland.

Why are Buffers Around Wetlands Important?

Buffers are needed to protect wetlands so they can perform public health and safety functions such as filtering ground water and controlling floods. Without adequate buffers, wetlands can become so degraded that they no longer provide these functions. Buffers are also needed to protect wetlands because they are an essential part of a wetland system. Fish need buffers to protect water quality and many wetland dependent species rely on adjacent upland buffers for nesting, foraging, and cover. Effective non-wildlife functions often occur in areas from 50 to 300 feet from the wetland edge, while many fish and wildlife species rely on land as far out as 800 feet from the actual wetland.

What Are the Economic Benefits in Protecting Wetlands?

Open space provides a variety of amenities, which are often reflected in increased real property values and added marketability for nearby property. People like living by productive lakes, ponds and creeks, and they will pay more for these amenities. Additional benefits include: reduced costs for pollution control and hazards mitigation, "quality of life" amenities, and nature-based tourism. There is also the ability to put wetlands into the Okanogan County Open Space/Open Space designation and receive a property tax reduction.

Wetlands and Twisp

More so than other land use issues, wetlands protection is controversial, making it necessary to ensure that a reasonable balance exists between the goal of wetlands protection and private property rights. Wetland areas in Twisp are likely associated with the Methow and/or Twisp Rivers. These wetlands, particularly those shown on the National Wetlands Inventory Maps coincide with floodplain and wildlife habitat areas along the rivers and, therefore, receive protection through implementation of the Shoreline Master Program.

1. Classification

Wetlands shall be identified and delineated by a qualified wetland professional in accordance with the Washington State Wetlands Identification and Delineation Manual (Ecology Publication #96-94, or as revised and approved by Ecology). Wetland delineations are valid for five years and performed using the Federal Manual for Identifying and Delineating Jurisdictional Wetlands (1987, as amended); and the US Army Corps of Engineers. (2006) Regional Supplement to the 1987 Delineation Manual: Arid West Region. The Town may use the following information sources as guidance in identifying the presence of wetlands and the subsequent need for a wetland delineation study;

- Hydric soils, soils with significant soil inclusions, and "wet spots" identified within the local soil survey;
- National Wetlands Inventory;
- Previous wetland rating evaluation; and,
- On-site inspection

Wetlands shall be rated according to the Washington Department of Ecology wetland rating system, as set forth in the Washington State Wetland Rating System for Eastern Washington (Ecology Publication #04-06-015, or as revised and approved by Ecology).

Wetlands in Twisp shall be classified into the following categories according to the manual referenced above:

Category I - Category I wetlands are:

a. alkali wetlands;
b. wetlands that are identified by scientists of the Washington Natural Heritage Program/DNR as high-quality wetlands;
c. bogs;
d. mature and old-growth forested wetlands over ¼ acre with slow-growing trees;
e. forests with stands of aspen; wetlands that perform many functions very well (scores of 70 points or more)

Category I wetlands are those that:

a. represent a unique or rare wetland type; or
b. are more sensitive to disturbance than most wetlands; or
c. are relatively undisturbed and contain ecological attributes that are impossible to replace within a human lifetime; or
d. provide a high level of function.

We do not wish to risk any degradation to these wetlands. Generally, these wetlands are not common and make up a small percentage of the wetlands in Eastern Washington. Category I wetlands include alkali wetlands, bogs, Natural Heritage wetlands, mature and old-growth forested wetlands with slow growing trees, and wetlands that perform many functions well, as measured by the rating system.

Category II - Category II wetlands are:

a. Forested wetlands in the floodplains of rivers;
b. Mature and old-growth forested wetlands over ¼ acre with fast growing trees;
c. Vernal pools; or
d. Wetlands that perform functions well (scores between 51-69 points).

These wetlands are difficult, though not impossible, to replace. They provide high levels of some functions. These wetlands occur more commonly than Category I wetlands, but still need a high level of protection.

Category III - Category III wetlands are:

a. Vernal pools that are isolated; or
b. Wetlands with a moderate level of functions (scores between 30-50 points).

Wetlands scoring between 30 and 50 points generally have been disturbed in some ways and are often less diverse or more isolated from other natural resources in the landscape that Category II wetlands.

Category IV - Category IV wetlands have the lowest levels of functions (scores fewer than 30 points) and are often heavily disturbed. These are wetlands that we should be able to replace, and in some cases improve. These wetlands may provide some important functions and also need to be protected.

2. Designation

To date there has been no wetlands specific mapping done specifically for Twisp other than the U.S. Fish and Wildlife Services National Wetlands Inventory (NWI) maps. To remedy this, the Town should pursue an accurate accounting of all wetlands in its planning area based on the Washington State Wetlands Rating System for Eastern Washington. However, until funding is obtained to conduct a comprehensive inventory of wetlands, the National Wetlands Inventory (NWI) maps shall be used as a base designation. Map CAV Wetlands in the Map Appendix, along with other supportive documentation, shall be used to review development proposals, but because the National Wetlands Inventory was done at such a broad scale, local verification according to the classification criteria shall be part of the standard process for identifying and designating wetlands.

GEOLOGICALLY HAZARDOUS AREAS

Geologically hazardous areas consist of the following types: Erosion hazard Areas; Landslide Hazard Areas; Mine Hazard Areas; Seismic Hazard Areas; and Volcanic Hazard Areas. Each type has different criteria for determining and evaluating the extent of the hazard area, however all types, when necessary, will use the same classification system. Based upon the risk to development in geologically hazardous areas, the following categories will be used:

- Known or Suspected Risk
- No Risk
- Risk Unknown (Data not available to determine presence of absence of a geological hazard)

1. Classification

Erosion Hazard Areas – Erosion hazard areas are those areas that contain two of the three the following characteristics:

a. A slope of 25% or greater. The following soils, depicted on Map CAVI in the Map Appendix, have slopes of at least 25% or greater (it is important to note that soils are rated with a range of slopes, e.g. 0-30%, 20-40% etc.):

301—Johntom-Foggydew-Rock outcrop complex, 35 to 75 percent slopes

302—Johntom-Rock outcrop complex, 15 to 35 percent slopes

323—Lani ashy sandy loam, 25 to 65 percent slopes

341—Lithic Haploxerepts-Kartar complex, 15 to 90 percent slopes

343—Lithic Haploxerepts-Newbon complex, 15 to 45 percent slopes

416—Newbon gravelly loam, 25 to 45 percent north slopes

417—Newbon gravelly loam, 25 to 45 percent south slopes

418—Newbon gravelly loam, 0 to 45 percent slopes, extremely stony

419—Newbon very gravelly loam, 25 to 65 percent slopes, eroded

436—Owhi ashy fine sandy loam, 25 to 45 percent slopes, extremely stony

b. Soils identified by the Natural Resource Conservation Service (NRCS) as very limited for home construction (both slab or with basement). The following soils, depicted on Map CAVII in the Map Appendix, are categorized as very limited in the 2009 soil survey:

207 - Aquandic Xerofluvents, 0 to 5 percent slopes

301—Johntom-Foggydew-Rock outcrop complex, 35 to 75 percent slopes

302—Johntom-Rock outcrop complex, 15 to 35 percent slopes

323—Lani ashy sandy loam, 25 to 65 percent slopes

325—Lani ashy sandy loam, 25 to 65 percent slopes, extremely stony

326—Leavenworth silt loam, 0 to 3 percent slopes

341—Lithic Haploxerepts-Kartar complex, 15 to 90 percent slopes

343—Lithic Haploxerepts-Newbon complex, 15 to 45 percent slopes

384—Muckamuck silt loam, 0 to 3 percent slopes

414—Newbon gravelly loam, 0 to 8 percent slopes

415—Newbon gravelly loam, 8 to 25 percent slopes

416—Newbon gravelly loam, 25 to 45 percent north slopes

417—Newbon gravelly loam, 25 to 45 percent south slopes.

418—Newbon gravelly loam, 0 to 45 percent slopes, extremely stony

419—Newbon very gravelly loam, 25 to 65 percent slopes, eroded

436—Owhi ashy fine sandy loam, 25 to 45 percent slopes, extremely stony

c. Soils identified by the Natural Resources Conservation Service (NRCS) as have potential erodibility based on wind and other factors. This data will be used to identify area of erosion potential specifically based on numeric values assigned to individual soils in the soil survey. Soils with a K Factor[6] greater than .30 are consider high risk for erosion. The following soils, depicted on Map CAVIII in the Map Appendix, have a K Factor for the whole soil of .30 or greater:

283—Haley ashy fine sandy loam, 0 to 8 percent slopes

326—Leavenworth silt loam, 0 to 3 percent slopes

384—Muckamuck silt loam, 0 to 3 percent slopes

Landslide Hazard Areas – Landslide hazard areas may include:

a. All areas that have historically been prone to land sliding

b. All areas containing soil types identified by the Natural Resource Conservation Service (NRCS) as unstable and prone to landslide hazard

c. All areas that show evidence of or are at risk from snow avalanches

d. All areas that are potentially unstable as a result of rapid stream incision or stream bank erosion

Mine Hazard Areas – Mine Hazard Areas include: Areas that are directly underlain by, adjacent to, or affected by mine workings such as adits, tunnels, drifts, or air shafts with the potential for creating large underground voids susceptible to collapse, tailings piles, and waste rock. In addition, steep and unstable slopes created by open mines, tailings and waste rock piles have the potential for being mine hazard areas. Mine hazard areas are based upon the identification of active or historic mining activity and site-specific information regarding topography and geology.

Seismic Hazard Areas – Areas subject to severe risk of damage as a result of earthquake induced ground shaking, slope failure, settlement, or soil liquefaction. The majority of the City is located within Seismic Design Category (SDC) C in accordance with the current International Building Code.

Volcanic Hazard Areas – Areas that are subject to pyroclastic flows, lava flows, and inundation by debris flows, mudflows, or related flooding resulting from volcanic activity. No Volcanic Hazard Areas are known to exist in or near Twisp. There are, however, several active volcanoes to the west that could have impacts on the community. The impacts include the fall-out of ash and accompanying disruption of transportation systems. There is no way to prevent the impacts of fallen ash, but there are ways to respond to the ash that could lessen its impacts.

6 - Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and saturated hydraulic conductivity (Ksat). Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

2. Designation

Geologically Hazardous Areas – Each type of geologically hazardous area is designated based on different factors. The designation process for each type follows:

Erosion Hazard Areas – Natural Resource Conservation Service (NRCS) soil slope, building suitability and erosion-hazard ratings are used to broadly designate geologically hazardous areas. Maps CAVI, CAVII and CAVIII in the Map Appendix illustrate potential erosion hazards, because of slope, soil properties, availability of water, etc. are more susceptible to severe erosion than others. Using the Classification Criteria, those areas in Twisp and its UGA that meet two of the three criteria are shown on Map CAIX in the Map Appendix.

The soil information needs to be combined with site-specific information (rills, inter-rills, and wind erosion) to determine if erosion hazard is present on the site. In Twisp's case, most of the land within the incorporated boundaries is already developed and soil stability has been proven.

Landslide Hazard Areas – Data available from Okanogan County indicates there are no identified landslide hazard areas within Twisp or its UGA. Lands that meet the classification criteria are hereby designated as landslide hazard areas and should be mapped, as resources become available.

Mine Hazard Areas – While there are old mine workings in the area around Twisp, with the exception of an old gravel mining operation on the former mill site, there are no mine hazard areas in Twisp or its UGA. Lands that meet the classification criteria are hereby designated as mine hazard areas and will be mapped, as resources become available.

Seismic Hazard Areas – There are no known active faults in Twisp. The majority of the Town is located within Seismic Design Category (SDC) C__ in accordance with the International Building Code (, as amended).

Volcanic Hazard Areas – There are no volcanic hazard areas in Twisp. There are, however, several active volcanoes that could have impacts on areas of Twisp, particularly the fallout of ash. There is no way to prevent the impacts of fallen ash, but there are ways to respond to the ash that could lessen its impact.

Town of Twsip
Comprehensive Plan
Critical Areas Map II
Potential Aquifer Recharge Areas

LEGEND

- Moderate Potential
- High Potential
- Critical Potential
- Town Limits
- Urban Growth Boundary

NORTH

Prepared by Highlands Associates 1/4/19
2009 Web Soil Soil and FEMA Floodplain Data
Parcel Data Okanogan County 10/2018

Town of Twsip
Comprehensive Plan
Critical Areas Map III
Flood Hazard Areas

LEGEND

- 100-Year Floodplain
- Rivers
- Floodway Boundary
- Town Limits
- Urban Growth Boundary

NORTH

Prepared by Highlands Associates 1/4/19
FEMA Floodplain Data
Parcel Data Okanogan County 10/2018

Town of Twisp
Comprehensive Plan
Critical Areas Map IV
Fish & Wildlife Habitat

LEGEND

- Riparian
- Uplands
- Town Limits
- Urban Growth Boundary

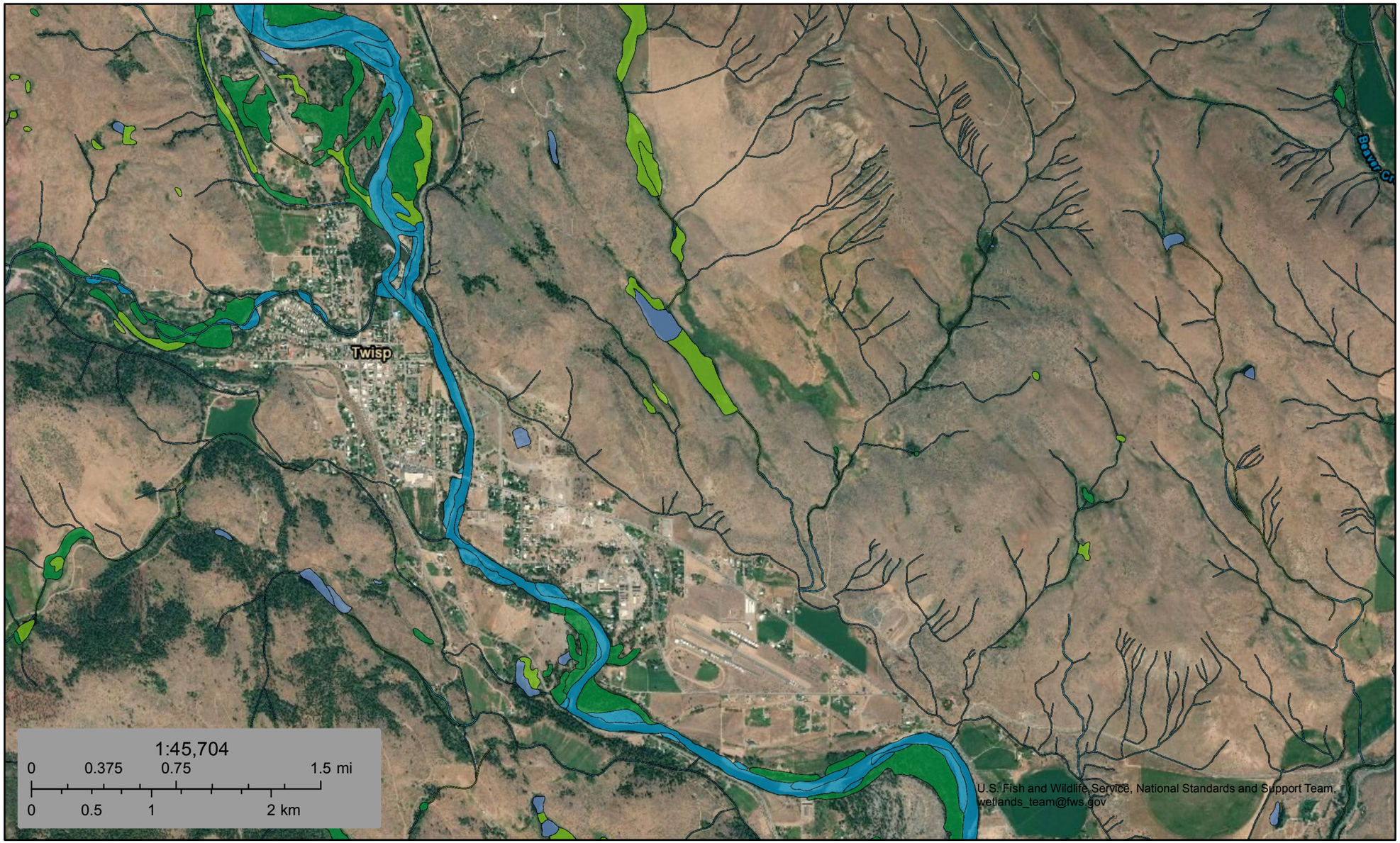
NORTH

Prepared by Highlands Associates 4/5/19
based on WDFW PHS Maps 2016 Data/Web Soil Soil and FEMA Floodplain Data
Parcel Data Okanogan County 10/2018

U.S. Fish and Wildlife Service

National Wetlands Inventory

Twisp NWI Map



April 9, 2019

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

National Wetlands Inventory (NWI)
This page was produced by the NWI mapper

Town of Twisp
Comprehensive Plan
Critical Areas Map VI
Steep Slopes

LEGEND

- Steep Slopes
- Town Limits
- Urban Growth Boundary

NORTH

Prepared by Highlands Associates 5/3/19
2009 Web Soil Soil slopes over 25%
Parcel Data Okanogan County 10/2018

Town of Twisp
Comprehensive Plan
Critical Areas Map VII
Building Limitations

LEGEND

Very Limited - Basements/Slabs

Town Limits

Urban Growth Boundary

NORTH

Prepared by Highlands Associates 5/3/19
2009 Web Soil Survey Very Limited Soils
Parcel Data Okanogan County 10/2018

Town of Twisp
Comprehensive Plan
Critical Areas Map VIII
Erosion Hazards

LEGEND

Erosion Hazard Areas

Town Limits

Urban Growth Boundary

NORTH

Prepared by Highlands Associates 5/3/19
2009 Web Soil Survey erosion hazard
Parcel Data Okanogan County 10/2018

Town of Twisp
Comprehensive Plan
Critical Areas Map IX
Geologically Hazardous Areas

LEGEND

Geologically Hazardous

Town Limits

Urban Growth Boundary

NORTH

Prepared by Highlands Associates 5/3/19
2009 Web Soil Survey erosion hazard
Parcel Data Okanogan County 10/2018