

TECHNICAL MEMORANDUM

To: Todd Tripp, Coquille Indian Tribe (CIT)
From: Steve Faust, AICP, 3J Consulting
CC: Matt Jensen, CIT; Virginia Elandt, ODOT
Date: November 9, 2017

Project Name: Coquille Indian Tribe Comprehensive Plan
Project No: 17421
RE: Draft Technical Memo #3: Opportunities and Constraints

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I. Introduction

This Technical Memorandum #3 (TM #3) summarizes the opportunities and constraints for meeting and implementing the goals and objectives of the Coquille Indian Tribe (CIT) Comprehensive Plan ("Plan") for the Empire Parcels. It builds upon *TM #1: Goals, Objectives, Existing Policies and Plans* and *TM #2: Demographics and Existing and Planned Conditions* to describe the opportunities and constraints for transportation infrastructure development and land use designations for the CIT Empire properties.

In this memo, we review the CIT's assets and needs to describe opportunities and constraints for the Empire properties through the lens of potentially suitable land uses and intensity of uses. For the purpose of this analysis and discussion, the Empire properties are divided into six subareas. An assessment of the transportation network follows, documenting the opportunities and constraints in establishing new internal and external roadways connections. This memo concludes with a description of next steps in the planning process. The information in this memo is organized into the following sections:

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II. Vision and Needs



The Coquille Indian Tribe vision is:

"We are a proud, powerful and resilient people, a sovereign nation, whose binding thread is our Coquille identity. In the footsteps of our ancestors we celebrate."

The CIT's vision guarantees to its membership and the community that comprehensive planning will include sustainable land uses. As defined in TM #1: Goals, Objectives, Existing Policies and Plans, the CIT desires to offer Tribal members, staff, and the invited public the opportunity to walk and bike where they need or want to go on Tribal lands. Thus, the completion of a Comprehensive Plan was identified by the CIT Tribal Council as a priority for the Tribe, and is included as an initiative in the most recent Tribal Strategic Plan. The Plan will guide and inform transportation infrastructure development and land use designations for the Empire properties in trust or in fee, as defined by the Bureau of Indian Affairs. The focus is on multimodal transportation, planning and redevelopment opportunities for the Empire properties. It will designate land uses that meet the needs of the Tribe in a cohesive manner.

As discussed in TM #1, CIT staff, committee members, Tribal members, Tribal officials and the community identify the following assets and needs for the Empire Parcels:

- **Community Resources.** Tribal members cite community facilities such as the clinic, and natural and cultural resources as the greatest assets for the Tribe; these include the Plankhouse, Canoe Shed, wetland trails, lakes and streams, cemetery, reservoirs and areas for traditional food gathering. The Tribe should continue to protect and/or improve access, as appropriate, to these resources.
- **Cultural and Natural Resources.** Some members believe the forest land on the Empire properties has more cultural value than economic value. Useful plant species include cedar, blackberry, huckleberry and mushrooms. Access to natural and cultural resources is very important, as is protecting and restoring water resources to encourage lamprey and salmon recovery. While not on CIT property, the ocean is considered one of the Tribe's water resources.
- **Transportation.** Continuous sidewalks, bike facilities and access across Cape Arago Highway, both on and off the reservation, are needed for safety and mobility purposes. Connectivity within and through the Empire properties should be improved, especially for emergency preparedness purposes. More frequent transit service on nights and weekends would be welcome.
- **Housing.** Housing is a critical need for the Tribe and throughout the region. Housing should be built on or near existing Kilkich housing and on the North Parcel where infrastructure is accessible. New housing should not be built adjacent to streams and reservoirs. A variety of housing types are needed and/or desired.
- **Economic Development.** Some Tribal members would like to see a store or gas station to serve Tribe members and the greater community. Other economic development opportunities that have been previously proposed include a business park, light industrial park and storage units.



- **Land Use.** A strong desire to develop, improve and maintain trails is shared by many members. Walkers would benefit from trail lighting, signage and trail maps, as well as expanded recreational activities. More formalized access to the Tarheel Reservoir is needed, such as docks and boat launches. Some members want a designated area for camping with cabins, archery ranges and horseback riding.
- **Kilkich Community.** Kilkich residents appreciate the open space, safety and quiet, wooded nature of their community. Residents would like to see the trails better maintained and made safer. They also see the cemetery and columbarium and reservoirs as important assets. Other Tribe members value having many community services located in one place. Several new facilities are needed to consolidate education and learning, and medical and justice services. There is strong demand for a combined coffee shop/market and gathering place, especially for seniors, as well as a community garden for collective farming.

Considering these desired programmatic uses and the following analysis of opportunities and constraints of the CIT Empire Parcels, future land use alternatives will be developed as part of the Comprehensive Plan.

The project scope of work required several criteria that must be used to evaluate these land use alternatives, including: cost, likelihood of being funded, safety, land use, environmental effects, volume-to-capacity and level-of-service transportation impacts, and bicycle and pedestrian connectivity. Based on discussions with the Comprehensive Plan Work Team (CPWT) and Tribal Council, the following CIT Core Values will also be considered when assessing the land use alternatives:

1. Promote the health and well-being of Tribal members and our community,
2. Provide equitable opportunities, experience and services to all Tribal members
3. Take care of our old people,
4. Educate our children,
5. Practice the culture and traditions of potlatch,
6. Consider the impacts to our people, land, water, air and all living things,
7. Practice responsible stewardship of Tribal resources.

These evaluation criteria and core values will be used to assess land use alternatives based on a relative score of high-medium-low categories.



III. Opportunities and Constraints

For the purpose of analyzing the opportunities and constraints of the CIT's North and South Empire Parcels, we have divided the properties into six subareas. These subareas primarily consist of trust lands, but there are presently two larger fee-owned parcels ("CSD" and "Lewis Connector") included in the Kellogg-Second Creek Subarea (B), and a small fee-owned lot ("Nelson") in the Tarheel-Libby Lane Subarea (E).

The key factors in defining these subareas are:

- Topography
- Creek watersheds and associated wetlands or floodplain
- Physical access points and routes

All six subareas are located on the east side of Cape Arago Highway, and thus there is no Coos Bay waterfront access within the North or South Empire Parcels. The CIT owns relatively narrow bands of land around the lower reaches of both First and Second Creeks that do, however, come close to Cape Arago Highway; and some CIT lands have direct highway frontage between the Lower Fourth and Lower Tarheel Creek areas.

All subareas are illustrated in Figure 1, and for the purposes of narrative identification and readability are numbered and named as follows:

- A. Wisconsin-First Creek
- B. Kellogg-Second Creek
- C. Killich-Lower Fourth Creek
- D. Tarheel Lake Natural Area
- E. Tarheel-Libby Lane
- F. Upper Fourth Creek

Note that Subarea F: Upper Fourth Creek has three noncontiguous zones with slopes under 10% (e.g. the most developable land). See Figure 9 later in this memorandum for more information.

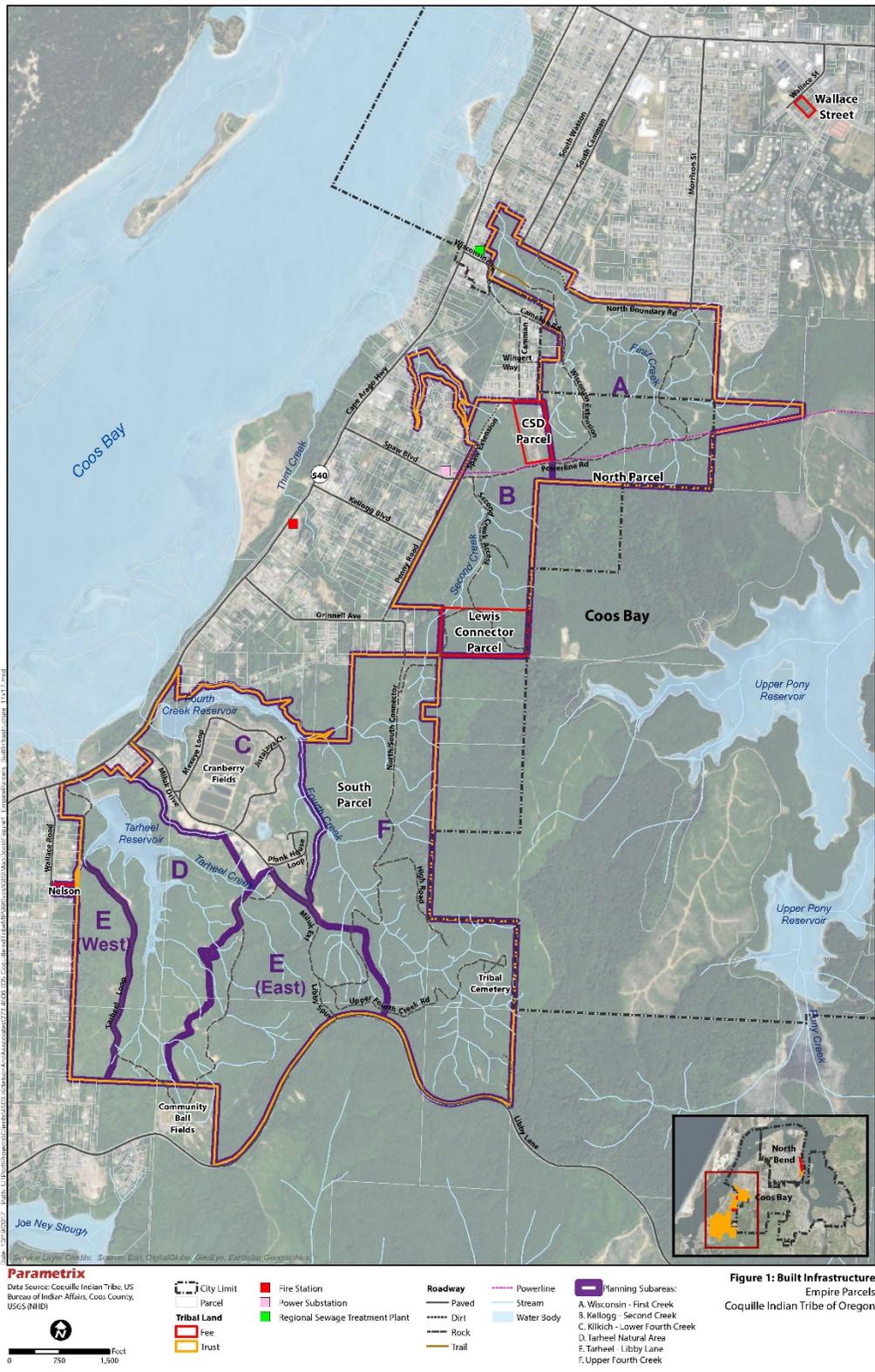


Figure 1. CIT Empire Parcels: Built Conditions and Planning Subareas



Named Roadways within Empire

With one or two exceptions, this memorandum only analyzes the named roadways within the CIT's North and South Empire Parcels that have paved or improved gravel surfaces. Records and mapping for these roadways were provided by the CIT. There are many other unnamed and/or less maintained gravel roads and pathways throughout both Empire Parcels.

Topographic Overlay

There is considerable topographic variation within the North and South Empire Parcels. This factor may have considerable impact on the feasibility and cost of development. Figure 2 illustrates lands within each subarea that are under 10% slope. For example, the existing Kilkich Village is located between two streams in a generally "flat" area (under 10% slope). These conditions, plus reasonably direct access to Cape Arago Highway, were probably key factors in the CIT's siting decisions for Kilkich Village. The original conditions at Kilkich are therefore somewhat of a model for ideal development considerations that should be looked for in other subareas of the Empire Parcels. Although development on slopes over 10% is possible, particularly at the lower end of the range, development costs begin to escalate as slopes steepen, including for road building, extending utility services, stream protection, and from alteration of landforms and vegetation. Viewsheds also can be adversely impacted. For the purposes of identifying North and South Empire Parcel opportunities and constraints, lands over 10% slope are generally not recommended for development, except for improvements to or the development of connecting roadways, or for the siting or expansion of some special uses.

Topography also has a direct impact on the delineation of tsunami evacuation zones. Almost the entirety of the North and South Empire Parcels are outside of the Distant Tsunami Evacuation Zone. The Distant Zone boundary generally follows Cape Arago Highway. This Distant Zone only extends slightly into the Empire Parcels at First Creek and Fourth Creek. The Local Tsunami Evacuation Zone extends further inland in many places. See Figure 2 for the Distant and Local Tsunami Evacuation boundaries and additional specifics and discussion under the six subarea summaries.

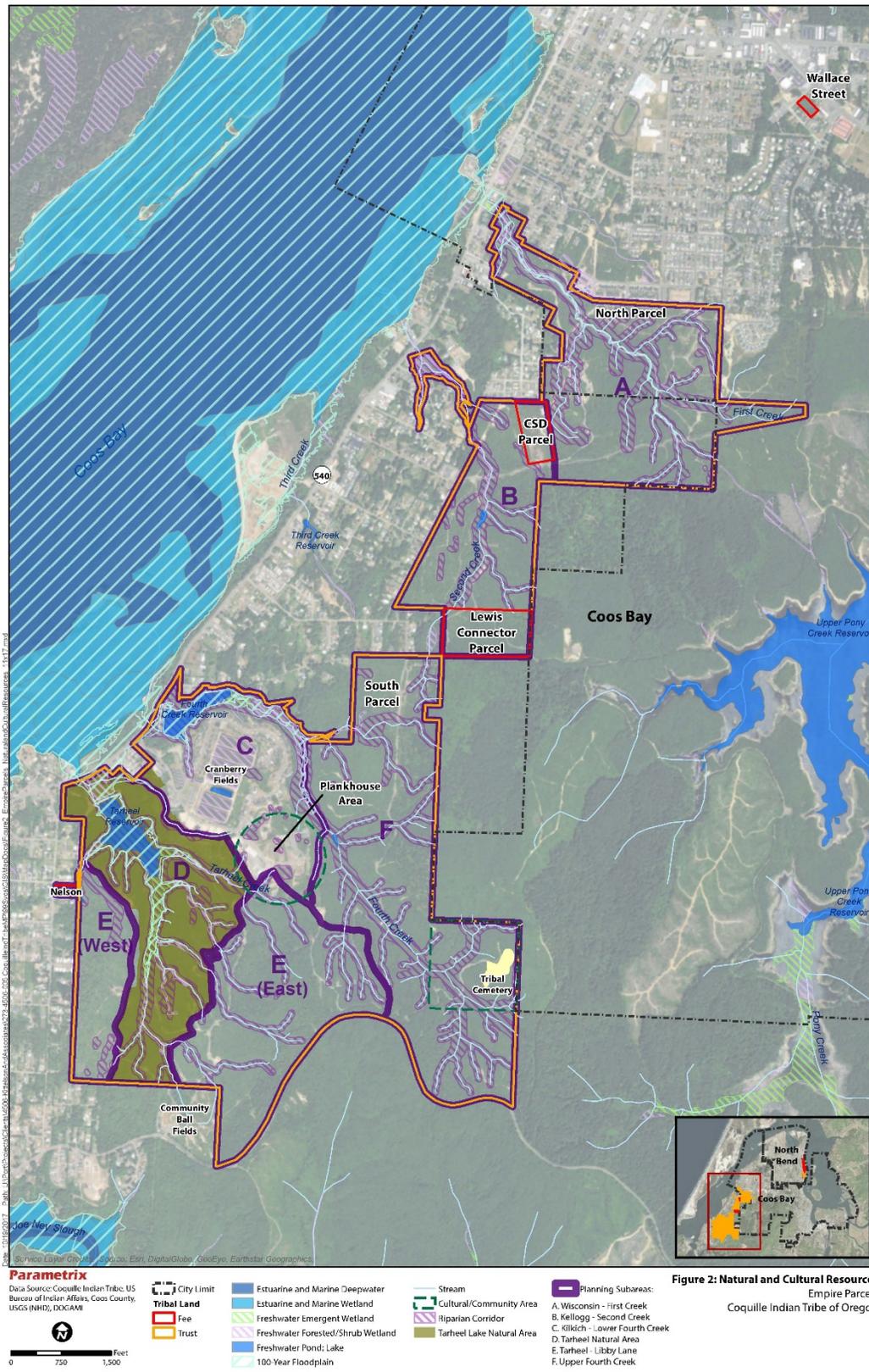
Vegetation

Another overarching characteristic that may influence CIT planning and development solutions is that most of the North and South Empire Parcels are forested. The major exception is Subarea C: Kilkich-Lower Fourth Creek, which is the site of the Kilkich Village and CIT offices and other facilities. See Figure 3 for Natural and Cultural Resources.

The rest of Empire had been commercially logged for decades, culminating in nearly all of the North and South Empire Parcels being completely logged off in the 1970s before these lands were transferred from private to CIT ownership. Current forest resources consist almost exclusively of second and third growth trees going through various stages of succession. Invasive and some non-native species are common, and the original ecology of Empire with respect to plant and animal species, surface water, etc. and other factors has been repeatedly disrupted.

The implication of this history is that many landform and vegetation alterations that might occur as an outcome of development may not be a significant permitting or regulatory issue. Nonetheless, any changes to streams, wetlands, and other water features will still trigger environmental regulations. In addition, there appears to be little or no commercial timber potential left within Empire, a reality that was reflected in comments from CIT leadership, staff, and members in the early stages of this comprehensive plan process.

In addition, Tribal leadership has expressed concerns that forest conditions within the Empire parcels pose a risk of fires that could threaten residential areas (Kilkich Village at present). Forest management and the siting of any new development should take this risk into consideration.



Subarea A: Wisconsin-First Creek

The north end of Subarea A is within the City of Coos Bay and the south end is in unincorporated Coos County (Figure 4). The north end is accessed off Cape Arago Highway, via Wisconsin Avenue/Cameron Road. Only the section of this roadway named Wisconsin Avenue is paved. Other named graveled roadways within this subarea include Wisconsin Extension, North Boundary, which borders the south edge of existing residential development within the City, and Powerline, which follows the east-west alignment of a transmission-scale power line.

An unnamed gravel road connects Powerline Road to the North Boundary Road, and nominally to the paved Morrison Street within the City residential neighborhood. However, physical access into this neighborhood from this point is currently blocked by a gate.

The Powerline Road forms the approximate south boundary of Subarea A.

First Creek drains the entire subarea. The CIT controls a narrow band of land around the lower reach of this creek almost to Cape Arago Highway. The upper reach of First Creek splits into two primary tributaries. The larger tributary arcs around the north and east sections of the subarea, the second tributary flows south to north along the western edge of the subarea.

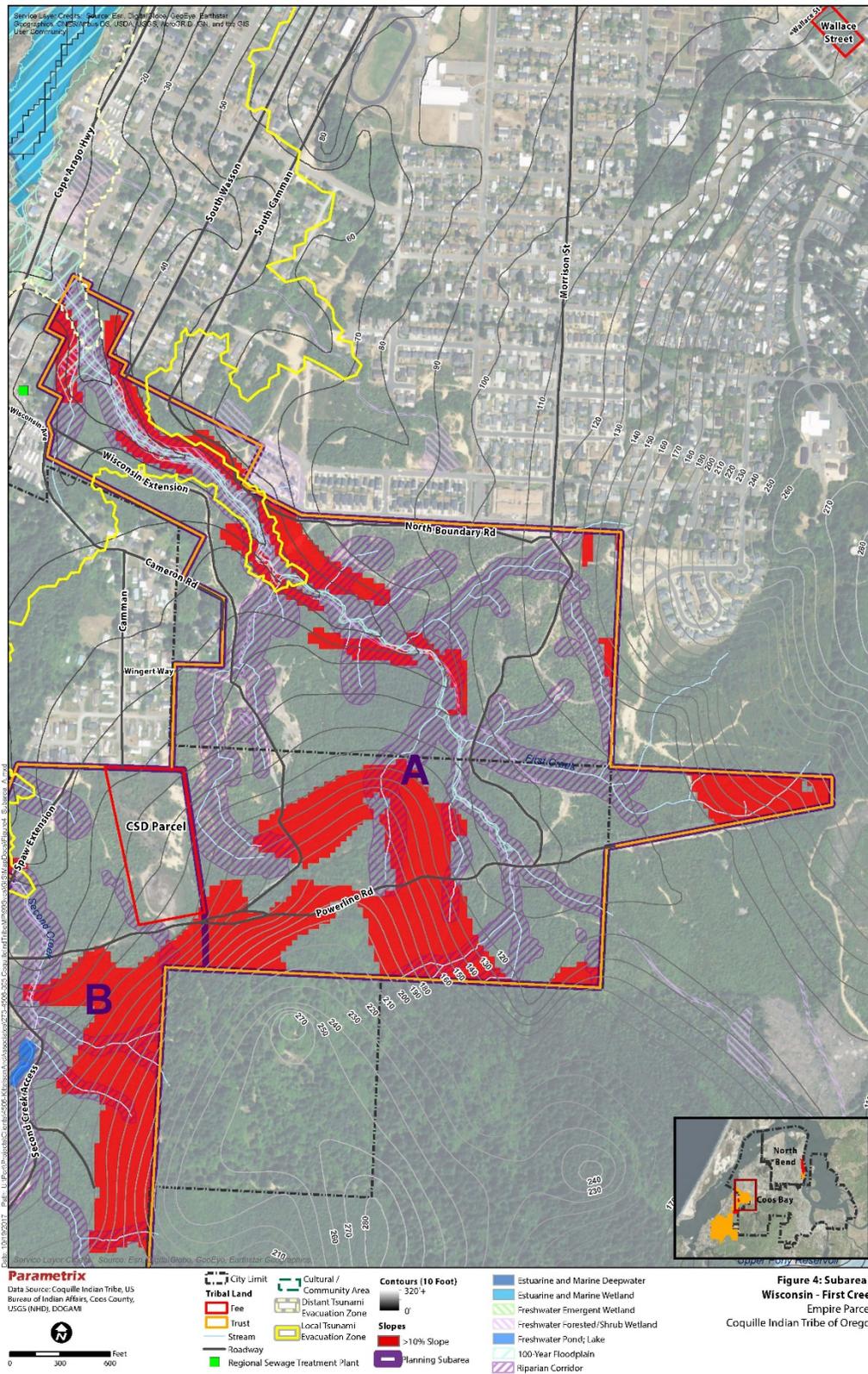


Figure 4. CIT Empire Parcels: Subarea A



Opportunities

1. Major utility infrastructure¹

Subarea A has no “urban” utility services, except for the Pacific Power transmission-scale power line that runs east to west along the gravel Powerline Road.

The north half of Subarea A is within the City of Coos Bay. Based on topographic constraints, this northern half is probably more easily developed than the unincorporated south section. In addition, existing Coos Bay neighborhoods border the north and east sides of Subarea A, with some unincorporated neighborhoods to the west. For these reasons, the extension of water and wastewater services into Subarea A, at least for the north half, should be less costly than for any other subarea of the Empire Parcels, excepting perhaps for Subarea C (Kilkich Village). More discussion on utility capacity follows.

Direct local electrical service from this transmission line is not possible. Local service would have to be extended from the line’s west terminus in an adjacent private residential neighborhood. There is a major power substation at this terminus located on Spaw Blvd. just outside and west of the North Empire boundary (see Subarea B). Nonetheless, the existence and location of this transmission line is a strong indication that the extension of local electrical service to both the North and South Empire Parcels would not be challenged by capacity issues, unless a power-intense use(s) was sited in Empire, such as a major industrial plant. In any event, this existing transmission line/substation would potentially make the location of a power-intensive use within the Empire Parcels more feasible and less expensive.

There are also existing distribution-scale and/or local delivery power lines within the Coos Bay neighborhood north of Subarea A, along Cape Arago Highway and in the unincorporated neighborhoods abutting the Subarea A to the west. New electrical power service could be provided to future development within Subarea A and the Empire Parcels by upgrades and/or extensions of these lines. Feasibility is dependent on the specific sites and levels of future development. The controlling factor remains the same regardless: the presence of the Pacific Power transmission-scale line and major substation at Spaw Boulevard means that the underlying system capacity on the west side of the Coos Bay Peninsula is adequate for nearly all forms and intensities of future development within the Empire Parcels, perhaps only excepting that needed for power intensive industrial uses.

Water and sewer major distribution lines are located in Cape Arago Highway. Based on local utility input, these mains have adequate capacity to serve any of the range of uses being currently contemplated for Subarea A, as do the regional sewage treatment and water storage systems that serve the entire Coos

¹ Based on Northwest Natural records, there is no natural gas service presently available anywhere within or near to the North or South Empire Parcels. Natural gas is however available on the eastside of the Coos Peninsula within the cities of Coos Bay and North Bend.



Peninsula. The new regional sewage treatment plant is sited just outside of this subarea on Wisconsin Avenue at Cape Arago Highway near First Creek.

The size and alignment of new water and sewer local service lines, and any associated infrastructure that may be needed (e.g. pump stations) to serve Subarea A will vary based on the size, nature, and location of future development, and associated topography. It may be possible to extend local service utilities, including local electrical service, from existing City of Coos Bay residential neighborhoods that abut the north end and west side of this Wisconsin-First Creek Subarea, especially for the portions of the subarea currently within city limits.

Feasibility is dependent on the specific sites and levels of future development. The controlling factor remains the same regardless: the presence of major water and sewer lines along Cape Arago Highway, and the new wastewater treatment plant, means that the underlying system capacity on the west side of the Coos Bay Peninsula is adequate for nearly all forms and intensities of future development in the Empire Parcels, perhaps only excepting that needed if intensive water/sewer industrial uses were developed.

2. Incorporation of CIT cultural resources, and reuse or preservation of site amenities

Subarea A does not contain any historic structures for reuse or preservation. However, First Creek is a prominent natural feature in Subarea A, and historically a source of lamprey and salmonids that were harvested for subsistence and cultural purposes by CIT members. Some salmon restoration activities are currently underway in this area, and culverts along Cape Arago Highway are being replaced, which reopens stream corridors to lamprey and salmon. Subarea A includes forest land along the southern and eastern boundaries, which is also considered a cultural asset. Valuable plant species include Cedar, blackberry, huckleberry and mushrooms.

Development plans should enhance access to these resources, as well as protect and restore water resources to encourage lamprey and salmon recovery. The area may also be suitable for developing horticulture activities.

3. Open spaces and natural areas

As noted above, the primary open space and natural feature in Subarea A is First Creek. The lower reach of First Creek is within a relatively narrow band of CIT ownership, and includes riparian vegetation and some 100-year floodplain. This CIT ownership does not however extend all the way to the Cape Arago Highway culvert undercrossing, stopping one block short. The confined nature of this lower reach and the surrounding ownership and property pattern suggests that there is little lower reach development potential under any scenario, and that this lower corridor should best be protected and restored in its entirety for natural and cultural values, at least up the confluence of the creek's two main tributaries.

Riparian vegetation is associated with the main stem and all the tributaries of First Creek's upper watershed. As noted above, development plans, if any, should include protection and restoration of the riparian areas.



4. Waterfront access for viewing, fishing and boating

There is no portion of the Wisconsin-First Creek subarea that fronts onto Coos Bay. As noted above, CIT ownership does not extend to a Cape Arago Highway frontage. The narrow band of the North Empire Parcel around First Creek ends at S. Marple Street, one block east of the highway.

Constraints

1. Topography

The portions of the Wisconsin-First Creek Subarea that are in the upper reach of First Creek, east of the tributary confluence, and within the City of Coos Bay city limits, are generally below 5% grade, along with most of the easterly one-third of this subarea outside of the city limits. The topography of the other two-thirds of the land in the portion of this subarea in unincorporated Coos County ranges from 10% to 25% slopes.

The fee-owned CSD Parcel and other lands that span between Subarea A and Subarea B: Kellogg-Second Creek vary between 0% and 10% slope, but are mostly in the 5% to 10% range. Based on topographic considerations only, these sections may have potential for lower intensity development, such as single family and smaller multifamily residential uses, and for combining with sections of similar topography in Subarea B. However, the narrow and elongated configuration of the contiguous lands under 10% in Subarea A may challenge access and utility improvements.

2. Known hazardous materials sites

No hazardous material sites were identified based on ODEQ records.

3. Environmental issues requiring avoidance or mitigation

The First Creek watershed and associated riparian and floodplain areas should be protected and restored as part of any development plans for Subarea A. As the upper reaches of First Creek and its numerous minor tributaries are relatively complex and extensive, this could have an impact on the overall development potential of this subarea. Any future development in Subarea A should consider low impact development solutions, such as bio-swales, sediment traps, and different pavement types to direct, treat, and reduce storm water flows.

4. Tsunami inundation/flood zones

The Local Tsunami Evacuation Zone only extends into Subarea A along Lower First Creek. This tsunami zone is roughly coincident with the 100-year floodplain zone associated with this lower watershed. This is another reason to simply avoid any development and resulting mitigation in the lower reach of First Creek. The Distant Tsunami zone boundary is outside of Subarea A (along Cape Arago Highway). In addition, various scientific studies of climate change impacts predict a 4 to 5 foot sea level rise along the Coos Bay shoreline by year 2100. This could potentially bring marine tides and floods up to the face of Tarheel and Fourth Creek Dams,



inundate the Cape Arago Highway, and generate increased flooding of First and Second Creeks.

5. Utilities/public service infrastructure

The factors influencing the extension of public and private utility utilities are discussed under *Opportunities*. From the perspective of “main line” transmission and treatment there are no known limitations arising from current regional water, sewer, or electrical power capacity.

The same factors that may complicate land development in this subarea – topography, ownership patterns, and challenges in making transportation connections – mirror probable challenges to local service water and sewer extensions.

Potential land uses, conflicts and legal or policy requirements or guidelines

Subarea A is bounded by residential neighborhoods to the north and west, and forest lands to the east. As noted above, any development closest to the coast is constrained by the tsunami zone and the First Creek drainage basin, which lends to a narrow band of environmentally sensitive land around the lower reach of this creek. Steeper terrain along the southern boundary can maintain forest uses, providing areas for horticulture activity and natural stream protection.

Overall, this area benefits from ocean views, and may be considered for market-rate multifamily residential development in the eastern corner. An adjacent employment area could help tie to the residential communities and build on the activity generated by the nearby Mill Casino. Employment area could include a light industrial or business park with offices, as well as storage units, and potentially a general store or gas station.



Subarea B: Kellogg-Second Creek

Kellogg-Second Creek is entirely within unincorporated Coos County (as are Subareas C, D, E, and F). Subarea B includes the CIT's CSD and Lewis Connector fee-owned parcels (Figure 5). This subarea is entirely drained by Second Creek and includes a very narrow band of CIT ownership around the lower reaches of this creek. The CIT's ownership along the lower reach of Second Creek almost extends to the frontage of Cape Arago Highway.

Subarea B can presently be accessed off Cape Arago Highway via the paved Spaw Blvd, which passes through a non-tribal private residential neighborhood. Once crossing into the CIT's North Empire Parcel at Penny Road, Spaw becomes the gravel Powerline Road. A north-south gravel roadway named "Second Creek Access" intersects with Powerline and then parallels Second Creek down the middle of Subarea B, and through the edge of Lewis Connector Parcel to the north end of Subarea F: Upper Fourth Creek.

The second paved access to Subarea B from Cape Arago Highway is via Kellogg Boulevard, which also passes through a non-tribal residential neighborhood. Both Spaw and Kellogg intersect with the unpaved north-south Penny Road, which follows the west edge of the North Empire boundary. Unlike Spaw/Powerline, however, Kellogg Boulevard does not presently extend into CIT lands.²

The west boundary of Kellogg-Second Creek subarea also can be accessed via the paved Grinnell Road which connects to the south end of Penny Road.

² Third Creek flows into Coos Bay close to Kellogg Boulevard but is almost entirely outside of the CIT Empire Parcels. A very short section of the "top end" of this creek, and associated riparian vegetation, is within the northwest corner of Subarea F: Upper Fourth Creek. See alter discussion.



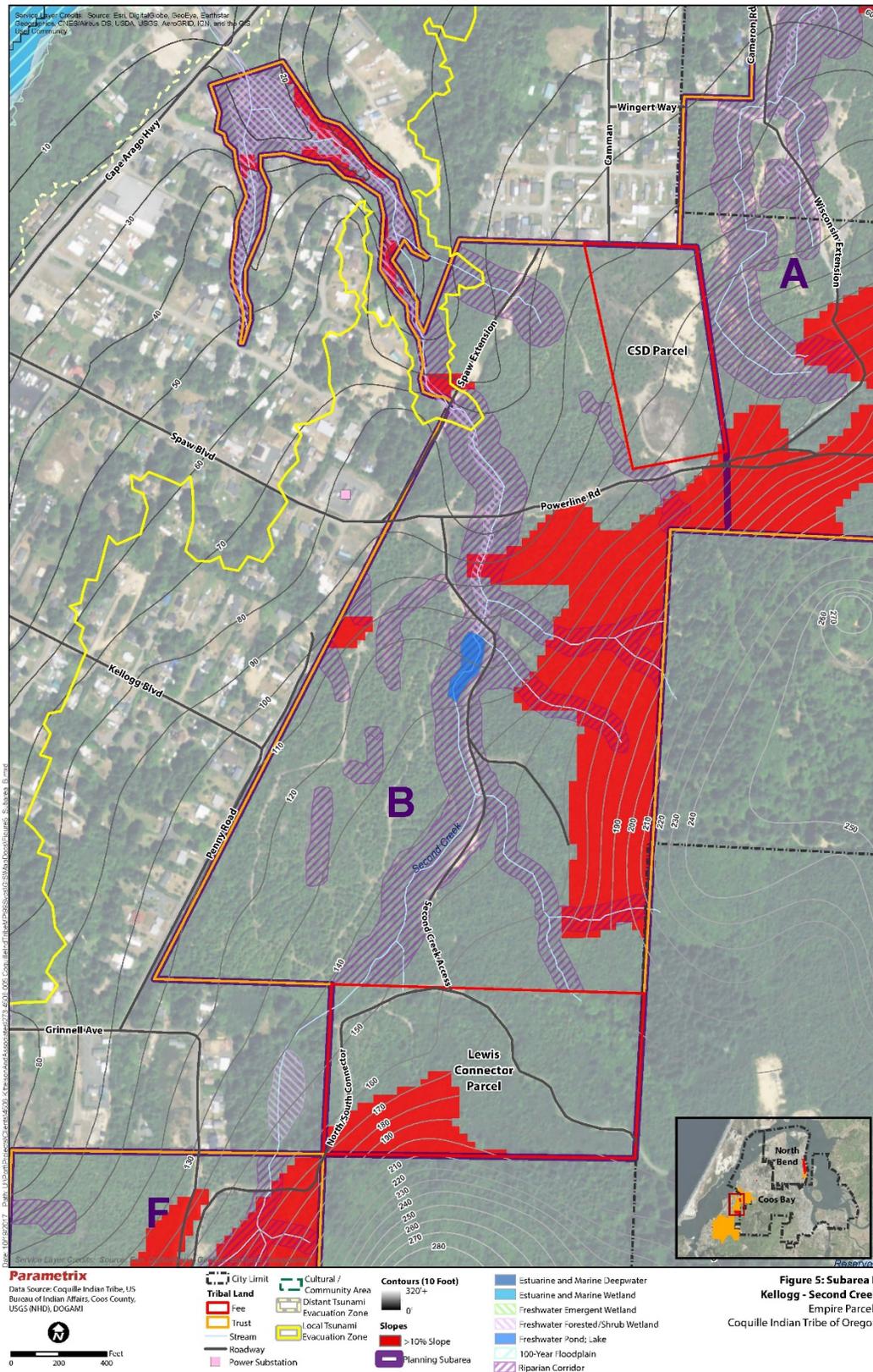


Figure 5. CIT Empire Parcels: Subarea B



Opportunities

1. Major utility infrastructure

There may be some technical possibility of extending local service utilities, including local electrical service, to Subarea B: Kellogg-Second Creek from the existing City of Coos Bay residential neighborhoods that abut the north and east sides of the Empire North parcel (see Figure 4: Subarea A). This possibility is limited however as Subarea B is outside of and not contiguous with the Coos Bay city limits, and would also face some challenges due to topographic constraints. It is also unlikely that the extensions of existing City residential utilities from the north through Subarea A and into Subarea B would be economic unless associated with like development in Subarea A.

Extension could also come via unincorporated neighborhoods to the west. Extensions could be along Spaw and Kellogg Boulevards into Subarea B. If, however, upgrades to existing lines in these neighborhoods were required to extend utilities into the Empire North Parcel, Subarea B utility costs would probably not be competitive with the costs for Subareas A or C extensions.

Subarea B currently has no “urban” utility services, except for a portion of the Pacific Power transmission-scale power line that runs east to west along Powerline Road. This transmission line ends at a power substation located on Spaw Boulevard outside of the North Empire Parcel and Subarea B. Direct local electrical service from this transmission line is not possible. Local service would have to be extended from this line’s west terminus at the Spaw Boulevard power substation. Extending local electrical service to this area should not be problematic unless a power intense use(s) is sited here. There are also existing distribution-scale and/or local delivery power lines within the unincorporated neighborhoods west of Subarea B, and along Cape Arago Highway New electrical power service could be provided to future development with the Subarea B by upgrades and/or extensions of these lines. Feasibility is dependent on the specific sites and levels of future development. The controlling factor remains the same regardless: the presence of the Pacific Power transmission-scale line and major substation at Spaw Boulevard means that the underlying system capacity on the west side of the Coos Bay Peninsula is adequate for nearly all forms and intensities of future development within the Empire Parcels, perhaps only excepting that needed for power intensive industrial uses.

Water and sewer distribution lines are located in Cape Arago Highway. Based on local utility input, these mains have adequate capacity to serve any of the range of uses being currently contemplated for Subarea B, as do regional sewage treatment and water storage systems. The new regional sewage treatment plant is sited north and west of this Kellogg-Second Creek Subarea on Wisconsin Avenue at Cape Arago Highway near First Creek. Local water and sewer service could also come through Subarea A or unincorporated neighborhoods.

The size and alignment of water and sewer local service lines, and any associated infrastructure, will vary based on the size, nature, and location of future



development, and associated topography. Feasibility is dependent on the specific sites and levels of future development. The controlling factor remains the same regardless: the presence of major water and sewer lines along Cape Arago Highway, and the new wastewater treatment plant, means that the underlying system capacity on the west side of the Coos Bay Peninsula is adequate for nearly all forms and intensities of future development in the Empire Parcels, perhaps only excepting that needed if intensive water/sewer industrial uses were developed.

2. Incorporation of CIT cultural resources, and reuse or preservation of site amenities

Like First Creek, Second Creek is an historic source of lamprey and salmonids harvested for subsistence and cultural purposes by CIT members. Subarea B includes forest land along the southern and eastern boundaries, with valuable plant species.

Subarea B does not contain any historic structures for reuse or preservation.

Development plans should enhance access to these resources and protect and restore water resources to encourage lamprey and salmon recovery for the preservation of cultural and natural resources. The replacement of culverts along Cape Arago Highway extends south through Subarea B, further contributing to lamprey and salmon restoration initiatives.

3. Open spaces and natural areas

The primary open space and natural feature in Subarea B is Second Creek. The lower reach of Second Creek is within an extremely narrow band of CIT ownership, which includes riparian vegetation. Current FEMA records show no 100-year floodplain in this area. There is a freshwater forested/shrub wetland within the lowest part of the reach nearest to Cape Arago Highway. This band of CIT ownership ends just short of frontage on the highway.

The confined nature of the lower reach and the surrounding ownership and development pattern suggests that this section is of very limited to non-existent development potential under any scenario. Therefore, this lower stretch of the creek, and its riparian corridor, should be protected and restored in its entirety for natural and cultural values.

The Upper Second Creek watershed pattern is less complex and smaller than that of Upper First Creek. Upper Second Creek primarily flows south to north. There is a small ponded area at the approximate center of Subarea B. Riparian vegetation is associated with the main stem and the minor tributaries of the upper watershed. Development plans for the mid and upper watershed, if any, should include protection and restoration of these riparian areas and associated non-wetland waters.

Upper Second Creek also extends outside of Subarea B. The upper creek passes through the northwest corner of the Lewis Connector Parcel, and has its primary headwater within the most northern section of Subarea F: Upper Fourth Creek. In addition, a short stretch of Upper Second Creek is completely outside of CIT lands,



west of the Lewis Connector Parcel. This stretch does include a small freshwater forested/shrub wetland. The private ownership and boundary pattern, and existing private development, may complicate any efforts to protect and restore this creek system.

4. Waterfront access for viewing, fishing and boating

There is no portion of Subarea B that fronts onto Coos Bay. The North Empire and Subarea B boundary extends close to, but does not front on, Cape Arago Highway at the west end of the narrow band of CIT ownership around Lower Second Creek.

Constraints

1. Topography

Subarea B is somewhat narrow and linear as it is wedged between non-tribal lands and 10%+ slopes. Nonetheless Subarea B has a relatively high percentage of lands under 10% slopes. However, Subarea B is somewhat isolated from the rest of North Empire and from Subarea F: Upper Fourth Creek in South Empire, by steeper 10% to 25% slopes to the east and south. About one-fifth of Subarea B is constrained by these slope conditions. Currently the unpaved Second Creek Access and North-South Connector roadways “thread the needle” around the toe of the 10% to 25% slope within the Lewis Connector and between areas of non-tribal ownership and even steeper adjacent hillsides.

Steep slopes in the Lewis Connector Parcel, which nominally links Subareas B and F, and the land to the immediate west of Lewis, which is outside of CIT ownership and partly developed, suggest that for many practical purposes the south end of B and north end of F cannot easily be developed jointly (see Subarea F discussion later in this memorandum).

2. Known hazardous materials sites

No hazardous material sites were identified based on ODEQ records.

3. Environmental issues requiring avoidance or mitigation

The Second Creek watershed and associated riparian and wetland areas should be protected and restored as part of any development plans for the Kellogg-Second Creek Subarea. The main channel of mid and upper Second Creek, which is roughly down the middle of the most developable sections of this subarea based on slope, will further constrain development potential. Any future development in Subarea B should consider low impact development solutions, such as bio-swales, sediment traps, and different pavement types to direct, treat, and reduce storm water flows.

4. Tsunami inundation/flood zones

The Local Tsunami Evacuation Zone edges into Subarea B along Lower Second Creek. This Local Tsunami zone is roughly coincident with the riparian corridor and wetlands associated with this lower watershed. This is another reason to simply avoid any development of the lower reach, and any resulting mitigation



requirements. In addition, various scientific studies of climate change impacts predict a 4 to 5 foot sea level rise along the Coos Bay shoreline by year 2100. This could potentially bring marine tides and floods up to the face of Tarheel and Fourth Creek Dams, inundate the Cape Arago Highway, and generate increased flooding of First and Second Creeks.

5. Utilities/public service infrastructure

The factors influencing the extension of public and private utility services are discussed under *Opportunities*. From the perspective of "main line" transmission and treatment there are no known limitations arising from current regional water, sewer, or electrical power capacity.

The same factors that may complicate land development in this subarea – topography, confining ownership patterns, and challenges in making transportation connections – mirror probable challenges to local service water and sewer extensions.

Potential land uses, conflicts and legal or policy requirements or guidelines

Most of the project area is in trust, meaning it is not subject to local or state land use regulations. However, Subarea B includes two of the three fee-owned parcels in the project area, the "CSD" and "Lewis Connector." Fee lands are not exempted from state or local regulations. These fee lands are designated as Industrial (IND) and Forest (F) by Coos County. At present, both parcels are in forest use and currently comply with local zoning regulations. The CIT is in the process of bringing these two parcels into trust status.

Considering the constraints of topography, plus flood zones and environmentally sensitive lands in the lower reaches of Second Creek, potential land uses include extending forest land from the east, with some employment area connecting to the CSD parcel. Housing may also be considered along the western edge, Tribal members have expressed concerns about crime in the non-tribal neighborhood to the west, which may impact the desirability of further residential development.

Subarea C: Kilkich-Lower Fourth Creek

Kilkich-Lower Fourth Creek and its centerpiece the Kilkich Village, is primarily accessed from Cape Arago Highway along the paved Miluk Drive (Figure 6). From the southeast end of Miluk Drive there is a gravel road - Miluk Extension/Libby Spur - that eventually intersects with the paved Libby Lane along the south boundary of the CIT's South Empire Parcel. Libby Spur has been gated at its south end and through access is no longer permitted. Circuitous access to Kilkich Village is also possible along the unpaved Tarheel Loop which passes through the Community Ball Fields on Libby Lane outside of the South Empire Parcel; or from the gravel North-South Connector, which intersects with the Miluk Extension.

Subarea C is the location of the CIT's Kilkich Village, consisting of single-family and lower density multi-family dwellings, and a range of tribal operations, offices, and other service buildings along and within a "ring" formed by Mexeye Loop and sections of Miluk Drive. The CIT's cranberry growing operation located in the center of these developments.

Immediately southeast of the Kilkich residential area is a cultural and recreational complex consisting of the CIT Plankhouse and Canoe Shed, and open recreational fields. Access to this cultural complex is via the Plankhouse Loop roadway which was paved in 2017 and intersects with the paved southeast end of Miluk Drive.

Lower Fourth Creek and the Fourth Creek Reservoir bound the north and east sides of Kilkich Village. Tarheel Creek, the Tarheel Reservoir, and the Tarheel Lake Natural Area (Subarea D for the purposes of this Memorandum) bound the south and west sides of Subarea C.

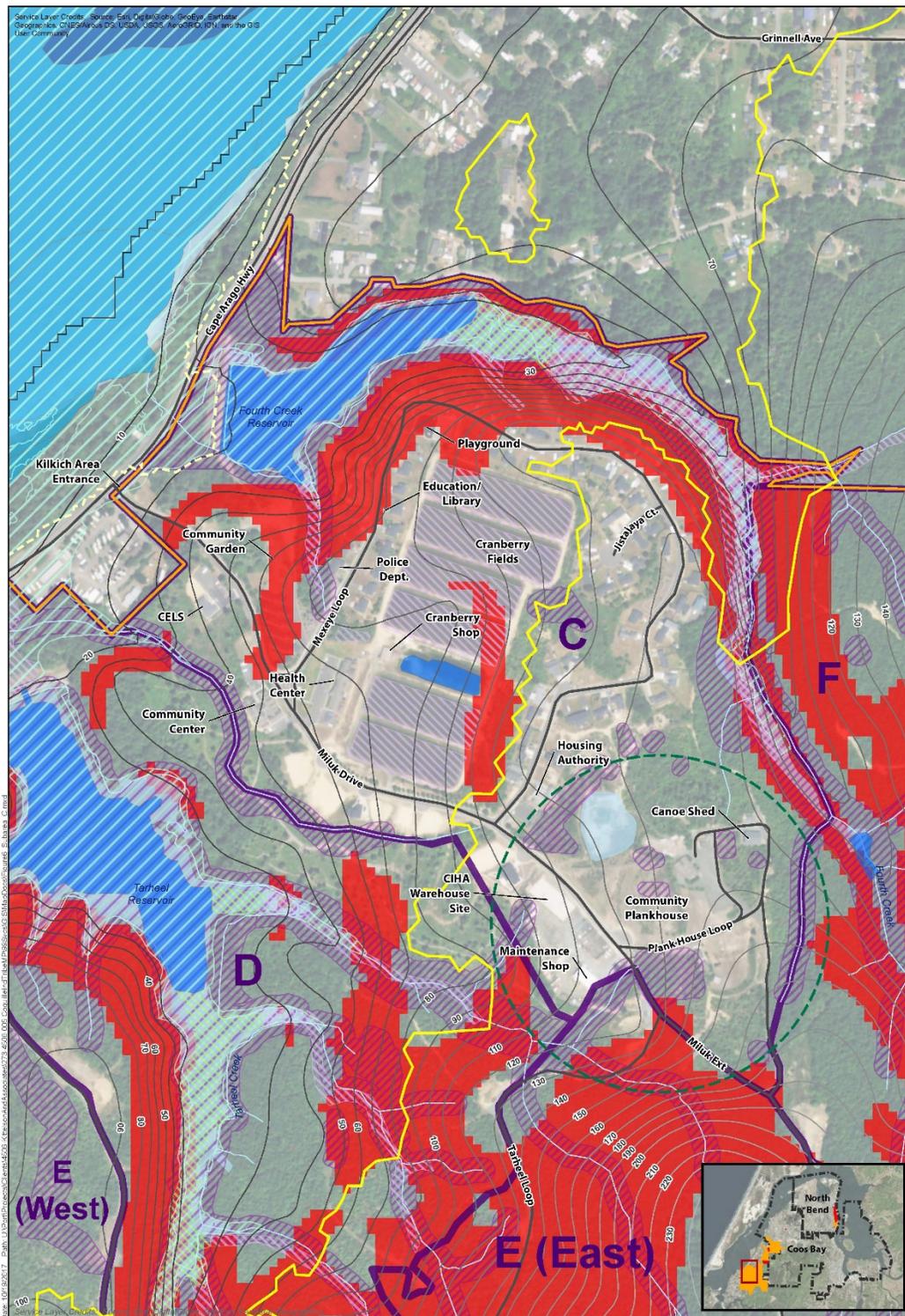


Figure 6. CIT Empire Parcels: Subarea C



Opportunities

1. Major utility infrastructure

Primary regional water distribution and sewer collection lines are located along Cape Arago Highway, as are area-wide electrical power distribution lines. Local water service (12-inch and 8-inch diameter) and sewer (8-inch diameter) main lines, and local electrical power distribution lines, extend into Subarea C.

Based on discussions with utility providers, new utility demands arising from redevelopment would not exceed existing water and wastewater transmission infrastructure capacity. Regional sewer treatment and water storage systems that serve the entire Coos Peninsula are also adequate to meet demand from changes or additions to Kilkich Village. A new water supply pump station may however be required to deal with some water pressure issues already being experienced in the Kilkich Village. The new regional sewage treatment plant is sited along Cape Arago Highway just north of Subarea B on Wisconsin Avenue near First Creek.

The size and alignment of any new water and sewer local service lines and associated infrastructure to serve new or expanded Subarea C developments will vary based on the size, nature, and location of future development, and associated topography. Except for local water pressure issues, and limitations arising from prior development, Area C is probably the most cost-effective for expanded development.

Extending local electrical service in Subarea C should not be problematic unless a power intense use(s) is sited. These Subarea C utilities could be extended to serve new development in Subareas E and F. Feasibility is dependent on location, uses and scale of future development.

2. Incorporation of CIT cultural resources, and reuse or preservation of site amenities

Subarea C is the location of the CIT's Kilkich Village, and the majority of the Tribe's cultural facilities and uses are found here. Tribal members identify the Plankhouse, Canoe Shed, wetland trails, and the two abutting reservoirs as important cultural and historical resources. The Plankhouse and Canoe Shed are situated on 26 acres planned as a community park, and are a focal point for the community. The area provides ample opportunity for expanded recreational activities, including trails and camping. The Fourth Creek Reservoir is another important cultural resource, and has the potential to be a great Coho spawning area for the Tribe if properly maintained.

Subarea C is also home to most of the Tribe's community services. Facilities include the CEL (Culture, Education, and Library Services) building, a health clinic, and police station and judicial court. CIT members have identified the need for a new Education/ Learning Center that houses the library and the Cultural Resources and Education Department.

Subarea C has limited area for additional residential development. In addition, the Kilkich Village currently has several vacant lots designated for residential use.



Subarea C is however the most logical location within the Empire parcels for new or expanded buildings to house community services.

3. Open Spaces and Natural Areas

Subarea C encompasses several significant open spaces and natural areas:

- Lower Fourth Creek.
- Wetlands, 100-year floodplain, and riparian corridors associated with Lower Fourth Creek.
- Fourth Creek Reservoir.
- Mitigation wetlands within the Plankhouse area.
- Open fields and recreational open spaces within the Plankhouse area.
- Community Garden.
- Cranberry Fields.
- Short headwater riparian corridors associated with two or three minor tributaries of Tarheel Creek.

4. Waterfront access for viewing, fishing and boating

There is no portion of the Kilkich-Lower Fourth Creek Subarea that fronts onto Coos Bay. CIT ownership only extends to eastside frontage on the Cape Arago Highway along the dam that impounds the Fourth Creek Reservoir, and the adjacent Miluk Drive entry road and feature.

Views of Coos Bay are possible from atop the dam, but developing formal viewing access and facilities may be a matter of CIT policy and public safety concerns.

Opportunities for formal lakefront access to Fourth Creek Reservoir appears to be limited by the prior street and individual lot pattern established within Kilkich Village, as well as by the lot pattern on private lands north of the reservoir and outside of the South Empire Parcel.

Plan policies established for the Tarheel Lake Natural Area on the south side of Subarea C provide for managed access and use of that lake/reservoir, so the development of recreational amenities and access associated with the Fourth Creek Reservoir may not be pressing.

Constraints

1. Topography

The Kilkich-Lower Fourth Creek Subarea is almost entirely under 10% slope, except for slopes immediately along the corridors of Fourth Creek and Tarheel Creek. Many portions of Subarea C are under 5% slope.

These slope conditions were probably an important factor in the siting of Kilkich Village in this location, as well as the fact that this is the only Empire subarea with substantial frontage along, and short and easy access to, the Cape Arago Highway. The only other substantial frontage along a paved public roadway in



the rest of the CIT's Empire Parcels is Libby Lane along the south end of the South Parcel. Libby Lane also has access to some considerable lands with slopes under 10% (see the discussion of Subareas E and F later in this memorandum).

2. Known hazardous materials sites

No hazardous material sites were identified based on ODEQ records.

3. Environmental issues requiring avoidance or mitigation

Based on the primarily built-out condition of Subarea C, it is assumed that there would be no significant mitigation requirements for the limited, if any, possible new development opportunities in this subarea. Any future development in Subarea C should consider low impact development solutions, such as bio-swales, sediment traps, and different pavement types to direct, treat, and reduce storm water flows.

4. Tsunami inundation/flood zones

The Local Tsunami Evacuation Zone generally runs along the eastside of the Kilkich Village cranberry fields, and thus includes about half of this residential area and key CIT facilities such as the CELS building, community center, health center, and police station, as well as some of the nearby cultural areas. In the event of a major Cascadia Subduction earthquake in near-shore marine waters, the resulting tsunami could reach above the Local Tsunami evacuation line and leave behind areas flooded for weeks, isolating uplands and blocking key roadways. The CIT adopted a Hazard Mitigation Plan in 2017, so this Memorandum assumes that any development issues related to tsunami events will be addressed as per the 2017 plan.

There is a relatively extensive 100-year floodplain along Fourth Creek that extends eastward roughly to a point nearest to a line from the Plankhouse cultural area, as well as some freshwater forested/shrub wetlands and a small freshwater pond.

Various scientific studies of climate change impacts predict a 4 to 5 foot sea level rise along the Coos Bay shoreline by year 2100. This could potentially bring marine tides and floods up to the face of Tarheel and Fourth Creek Dams, inundate the Cape Arago Highway, and generate increased flooding of First and Second Creeks.

5. Utilities/Public Service Infrastructure

The factors influencing the extension of public and private utility services within Subarea C are discussed under *Opportunities*. From the perspective of "main line" transmission and treatment there are no known limitations arising from current regional water, sewer, or electrical power capacity. Prior development has more or less defined and adapted to any issues with local service extensions within Subarea C.



Potential land uses, conflicts and legal or policy requirements or guidelines

Subarea C is the only area within either the North or South Empire Parcels that is urbanized. Development is lower intensity, consisting of residential dwellings, CIT offices and tribal services, and some other CIT buildings.³ Subarea C is “built-out” to a significant extent, with only very limited areas left to develop. Some platted and serviced residential lots remain vacant. The cranberry fields could conceivably be drained and redeveloped for other uses, such as tribal housing. The Housing Authority Board reports a need for 1-2 bedroom units for young adults and elders, as well as 2-3 bedroom units for young families. There is also need for other types of transitional, assisted living and hospice care housing. Any new development avoid environmentally sensitive wetland areas, streams and reservoir shorelines.

CIT members value having many community services located in the Kilkich Village. Several new facilities are needed to consolidate education and learning, medical and justice services. Many people expressed a strong demand for a small tribal commercial area and gathering place, particularly for elders.

There is significant opportunity in Subarea C to enhance recreational activities and access to fishing, gathering and horticulture opportunities with an open space land use designation. Potential activities and amenities could include:

- Extended-stay cabins and bunk houses
- New trails near the Plankhouse and south slough
- Disc golf course
- Off Highway Vehicles (OHV) trails
- Equestrian center/horse trails
- Boat ramps
- Fields and running track

³ For the purposes of analysis, this Technical Memorandum assumes that Kilkich cultural areas and open spaces would not be subject to any new residential redevelopment; and that any facility or use expansions would consist at most of enhancements and/or modest additions to existing cultural facilities and activities.



Subarea D: Tarheel Lake Natural Area

Subarea D consists of all of the Tarheel Reservoir and all but the upper ends of the Tarheel Creek watershed (Figure 7). Subarea D is within Tarheel Loop gravel roadway; and includes the “Tarheel Lake Natural Area” (TLNA), which was designated by the CIT in 1998. Opportunities and constraints, current and planned uses and development of Subarea D are defined in the TLNA Plan.⁴ This Memorandum assumes that no changes to the TLNA are in order, and that plans for alternate developments are not under consideration.

The Subarea D boundary for the purposes of this Memorandum primarily follows the Tarheel Loop gravel roadway, except for where development in Kilkich Village (Subarea C) backs onto the Reservoir, and some upper areas of Tarheel Creek. Tarheel Loop connects directly to Cape Arago Highway just south of the Tarheel Dam and creek’s confluence with Coos Bay. At its northeastern end, this loop roadway connects to the paved end of Miluk Drive near Plankhouse Loop. At its extreme south end, Tarheel Loop is briefly outside of CIT’s South Empire Parcel, and provides gated access from the north side to the Barview Area Charleston Area Parks Association (BACAPA) ball field complex off Libby Lane.

The Local Tsunami Evacuation Zone runs along the east and south edge of the Reservoir.⁵ The Tarheel Reservoir dam can be reached by a gravel spur road off the west leg of Tarheel Loop that forms the boundary between Subarea D and Subarea E. This spur appears to function as an access route for recreational users of the Reservoir.

From atop the Tarheel Dam there are views of Coos Bay, but it may be a matter of CIT policy and public safety concerns in defining and regulating any public access limitations.

⁴ The TLNA Management Plan names the reservoir as a “lake”, in other CIT documents and elsewhere in this Technical Memorandum the term “reservoir” is used. There is no physical difference between the two.

⁵ Various scientific studies of climate change impacts predict a 4 to 5 foot sea level rise along the Coos Bay shoreline by year 2100. This could potentially bring marine tides and floods up to the face of Tarheel and Fourth Creek Dams, inundate the Cape Arago Highway, and generate increased flooding of First and Second Creeks.



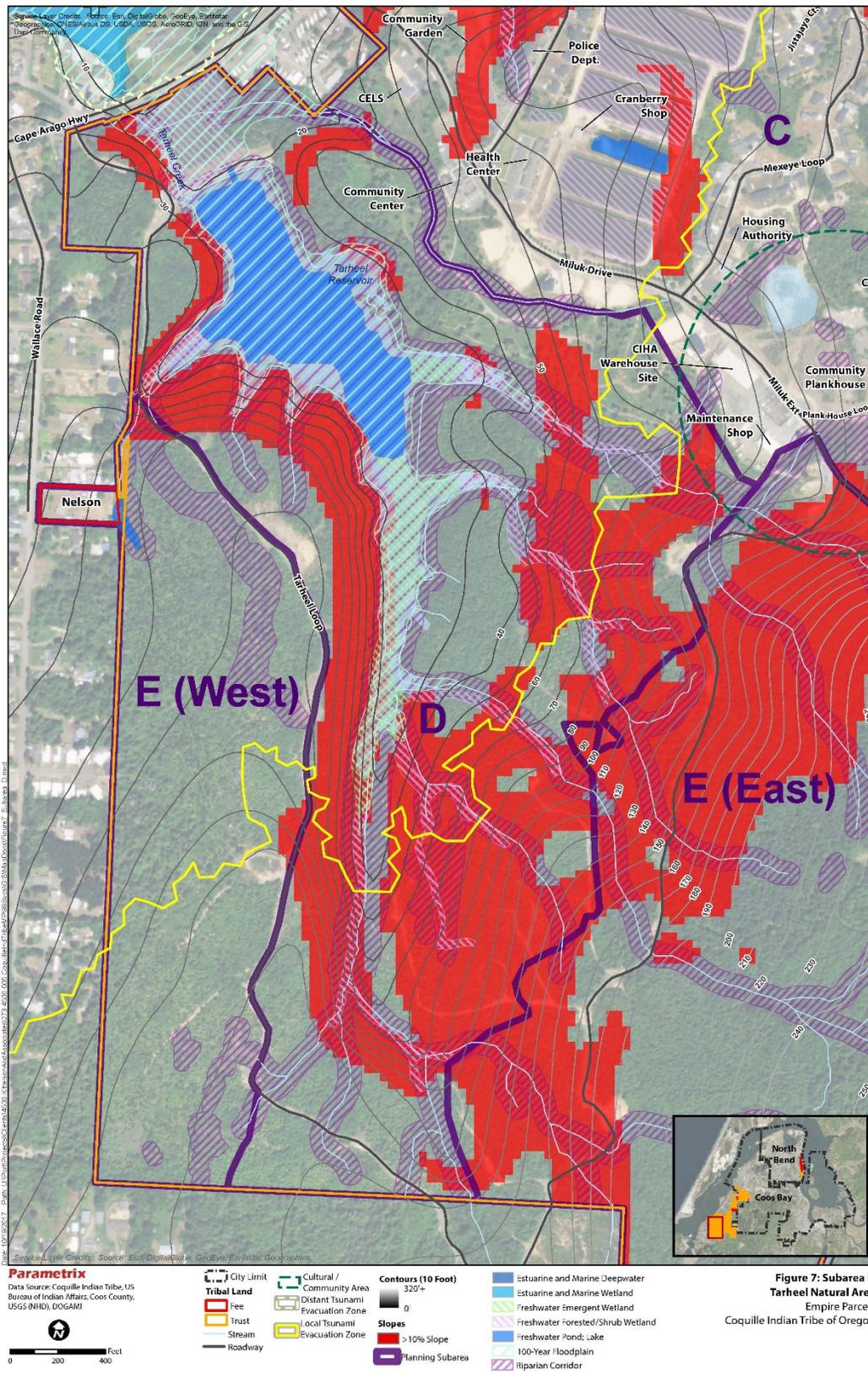


Figure 7. CIT Empire Parcels: Subarea D



Subarea E: Tarheel-Libby Lane

The Tarheel-Libby Lane Subarea consists of two distinct sub-sections along the south boundary of the CIT's South Empire Parcel (Figure 8). The Tarheel Lake Natural Area separates these two Subarea E sub-sections.

- The first (westerly) sub-section encompasses the area between Tarheel Loop and rear lot lines of non-tribal residential homes and lands along the east side of Wallace Road outside of South Empire. This neighborhood's property division pattern appears to include one or two undeveloped rights-of-way extending to the edge of the South Empire Parcel, but access from Wallace Road into Subarea E will be highly limited.

The CIT has a small fee-owned lot ("Nelson Parcel") on Wallace Road at Robertson Lane that also backs onto the South Empire boundary. Aerial photography shows this lot is developed. The lot could possibly be used to build a new road accessing this sub-section of Subarea E. Otherwise, this west sub-section of the Tarheel-Libby Lane Subarea will have to be accessed from the west leg of the Tarheel Loop.

- The second (easterly) sub-section of Subarea E encompasses the upper watershed of Tarheel Creek and has extensive frontage on the paved Libby Lane. A "Libby Spur" gravel roadway enters the CIT's South Empire Parcel through this sub-section of Subarea E. This roadway has however been closed and is not on the CIT's road inventory filed with the BIA. Other gravel roadways (roadway names in brackets) access the following sites and areas:
 - Kilkich Village (Miluk Extension)
 - Tribal Cemetery (Upper Fourth Creek roadway)
 - Subareas F and B (North-South Connector and Second Creek Access).

The most easterly portion of this east sub-section is drained by a minor upper tributary of Fourth Creek. This Fourth Creek tributary is physically separated from the rest of the Fourth Creek watershed by a steep (25% slope) ridge, and flows through a lower slope "notch". Any development of this small Fourth Creek tributary's watershed would be best undertaken in conjunction with the other lower slope lands in Subarea E.

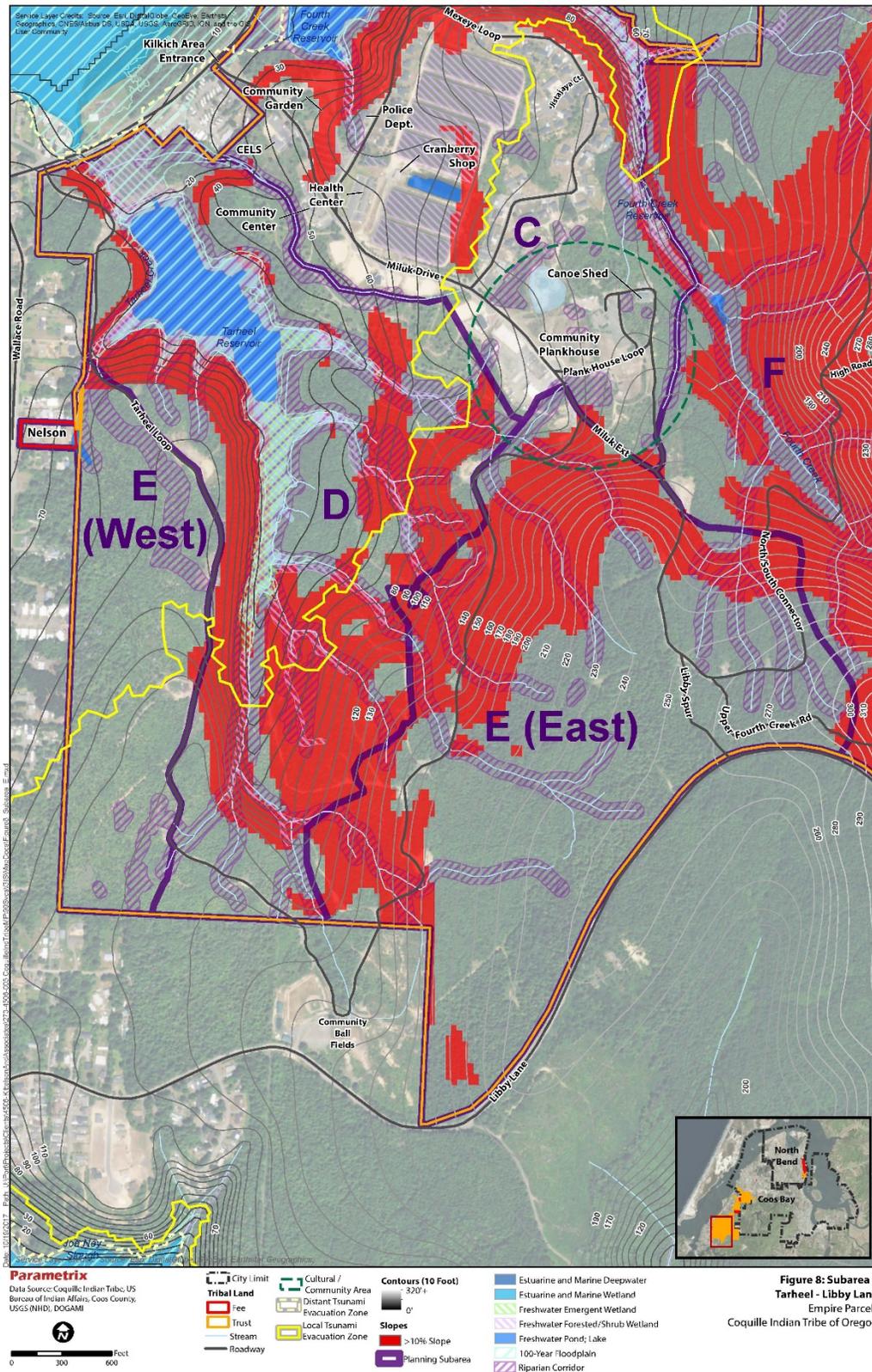


Figure 8. CIT Empire Parcels: Subarea E



Opportunities

1. Major utility infrastructure

Neither sub-section of Subarea E has any “urban” utility services. The existence and location of the electrical power transmission line that crosses Subareas A and B, and the power substation located just outside of Subarea B, reasonably assure that there will be no overall regional capacity issues that limit the extension of local electrical service or new development into Subarea E, unless a power-intensive industrial use is considered.

Water and sewer main distribution lines are located in Cape Arago Highway. Based on local utility input, these mains have adequate capacity to serve any of the range of uses being currently contemplated for the South Empire Parcel, of which Subarea E is a part, as do the regional sewage treatment and water storage systems that serve the entire Coos Peninsula. However, prior study by the CIT has indicated that a water pump station may be required to maintain adequate water pressure to Subarea E (as well as to Subarea F). The estimated cost of the pump station is \$5 million.

The size and alignment of new water and sewer local service lines and associated infrastructure to serve new or expanded Subarea C developments will vary based on the size, nature, and location of future development, and associated topography. There may also be some cost efficiencies from extending existing lines.

Feasibility is dependent on the specific sites and levels of future development. The controlling factor remains the same regardless: the presence of major water and sewer lines along Cape Arago Highway, and the new wastewater treatment plant, means that the underlying system capacity on the west side of the Coos Bay Peninsula is adequate for nearly all forms and intensities of future development in the Empire Parcels, perhaps only excepting that needed if intensive water/sewer industrial uses were developed.

2. Incorporation of CIT cultural resources, and reuse or preservation of site amenities

Neither sub-section of Subarea E has any historic or cultural structures for reuse or preservation. The forested lands include informal trails and clusters of plant species and berries accessed for cultural resources and traditional food gathering. Any development should enhance access to these resources by improving and maintaining trails.

3. Open spaces and natural areas

The primary open space and natural features in Subarea E are:

- *Westerly sub-section:* The Tarheel Reservoir and the TLNA are immediately adjacent to but not within this sub-section. Two minor drainages of Tarheel Creek that flow directly into the Reservoir extend into this sub-section,



along with associated riparian vegetation. The most northerly of the two drainages, which ends in the vicinity of the Nelson Parcel, also has some 100-year floodplain.

- *Easterly sub-section:* The upper watershed of Tarheel Creek and a single tributary of Fourth Creek are within this sub-section of Subarea E.

4. Waterfront access for viewing, fishing and boating

No portions of either sub-section of Subarea E extend to the Coos Bay shoreline or Cape Arago Highway frontage.

Constraints

1. Topography

- *Westerly sub-section:* Most of this sub-section is less than 5% slope, excepting a low ridge with 5% to 10% slopes that bisects the area west to east at about mid-point. This steeper slope also delineates the Local Tsunami Evacuation Zone boundary.
- *Easterly sub-section:* Most of this sub-section is less than 10% slope, with substantial areas under 5%. Steeper slopes are confined to the west and north edges of this sub-section where it abuts Subareas C, D, and F.

2. Known hazardous materials sites

No hazardous material sites were identified based on ODEQ records.

3. Environmental issues requiring avoidance or mitigation

As part of any development scenario, the stream corridors and riparian vegetation of Tarheel Creek and Fourth Creeks should be protected and restored as needed.

4. Tsunami inundation/flood zones

- *Westerly sub-section:* The Local Tsunami Evacuation Zone divides this sub-section of Subarea E into roughly two equal parts. Various scientific studies of climate change impacts predict a 4 to 5 foot sea level rise along the Coos Bay shoreline by year 2100. This could potentially bring marine tides and floods up to the face of Tarheel and Fourth Creek Dams, inundate the Cape Arago Highway, and generate increased flooding of First and Second Creeks.
- *Easterly sub-section:* This sub-section is entirely outside of the Local Tsunami Evacuation Zone

5. Utilities/public service infrastructure.

The factors influencing the extension of public and private utility services are discussed under *Opportunities*. From the perspective of "main line" transmission and treatment, there are no known limitations arising from current regional water, sewer, or electrical power capacity. Topography, confining ownership

patterns, and the challenges in making transportation connections are potential limitations to local service water and sewer extensions.

Potential land uses, conflicts and legal or policy requirements or guidelines

Generally, Subarea E would benefit from maintaining forest lands to provide a natural buffer along the drainages that feed into the Tarheel Reservoir, important for enhancing the quality of the Tarheel Natural Area. However, based on moderate slopes and proximity to Libby Lane, other uses such as housing may be considered for the easterly sub-section. The westerly sub-section could also accommodate housing, but may be limited by the access challenges discussed earlier. Any future development in Subarea E should consider low impact development solutions, such as bio-swales, sediment traps, and different pavement types to direct, treat, and reduce storm water flows.

In the southern area of the easterly sub-section, concerns have arisen over erosion and water quality issues caused by the adjacent ballfield development. The CIT donated a portion of the parcel along Libby Lane to BACAPA for this use. BACAPA is planning to develop four additional ball fields, a community center, disc golf course and snack shack, though the project currently remains unfunded. BACAPA will need to mitigate for effects on Tribal land.

Subarea F: Upper Fourth Creek

Subarea F has the longest footprint of any of the six Empire subareas as defined in this Memorandum (Figure 9). The Subarea F boundary abuts Subareas B, C, D and E.

North end access to Subarea F is via the paved Grinnell Avenue that connects to the North-South Connector gravel roadway. At its south end, the Upper Fourth Creek Subarea fronts onto a long stretch of the paved Libby Lane. The North-South Connector bisects Subarea F north to south and crosses approximately eight (8) tributaries in the Upper Fourth Creek watershed.

The gravel surface High Road intersects with the North-South Connector and climbs up a steep slope up to a dead end on or near a relatively flat plateau overlooking the Tribal Cemetery. However, most of this plateau is outside of the South Empire parcel boundary. The named Upper Fourth Creek gravel roadway intersects with the North-South Connector roadway very close to Libby Lane, and eventually dead ends at short loop road through the Tribal Cemetery.

Subarea F encompasses all but one of the upper (above the influence of the Fourth Creek Reservoir) tributaries and drainages of Fourth Creek. The upper end of Second Creek drains a small area in the northeast corner of Subarea F, and the very short upper reach of Third Creek drains an even smaller area.

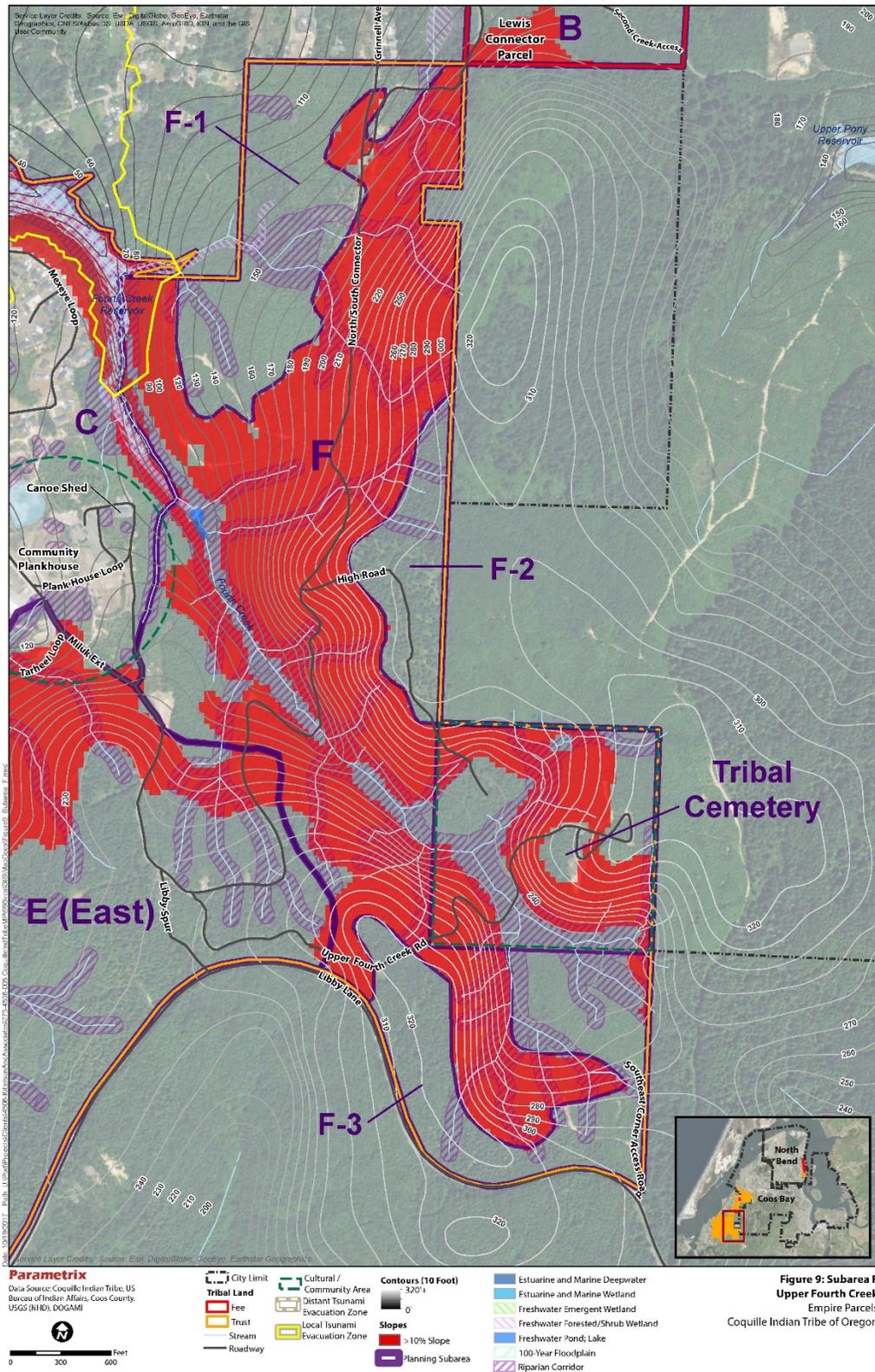


Figure 9. CIT Empire Parcels: Subarea F



Opportunities

1. Major utility infrastructure

Subarea F has no “urban” utility services. Topographic constraints from numerous steep slopes effectively divide the subarea into three distinct zones of land that are primarily under 10% slope (see Figure 9). This condition may greatly complicate cost-effective utility extensions, despite the more than adequate capacity of surrounding regional transmission, storage, and treatment facilities. In short, while this Upper Fourth Creek Subarea appears to be large, much of it may be marginally or outright undevelopable under any circumstances.

The existence and location of the electrical power transmission line that crosses Subareas A and B, and the power substation located just outside of Subarea B, reasonably assure that there will be no regional capacity issues that limit the extension of local electrical service. Power line extensions are also not excessively impacted by extremes and variables in slope.

Water and sewer main distribution lines are located in Cape Arago Highway. Based on local utility input, these mains have adequate capacity to serve any of the range of uses being currently contemplated for the South Empire Parcel, of which Subarea F is a part, as do the regional sewage treatment and water storage systems that serve the entire Coos Peninsula. It may also be possible to extend existing water and sewer utilities in Subareas B and C into Subarea F, although topography and the other development limitations discussed herein will limit feasibility.

The size and alignment of new major water and sewer local service lines, and associated infrastructure needed to serve Subarea F will vary based on the size, nature, and location of future development, and associated topography.

Feasibility is dependent on the specific sites and levels of future development. The controlling factor remains the same regardless: the presence of major water and sewer lines along Cape Arago Highway, and the new wastewater treatment plant, means that the underlying system capacity on the west side of the Coos Bay Peninsula is adequate for nearly all forms and intensities of future development in the Empire Parcels, perhaps only excepting that needed if intensive water/sewer industrial uses were developed.

2. Incorporation of CIT cultural resources, and reuse or preservation of site amenities

CIT leadership, staff and member indicated early in this comprehensive plan process that the Tribal Cemetery and columbarium on the east edge of Subarea F was an important cultural and open space resource. Areas along the road to the cemetery are also important for traditional food gathering activities. Valuable plant species including berries and mushrooms are found in the vicinity of the road to the cemetery. Any development should focus on improving access to the cemetery, as steep topography and gravel roads are challenging for elders and people with disabilities.



3. Open spaces and natural areas

The primary open space and natural feature in Subarea F is Upper Fourth Creek and its numerous tributaries and drainages coursing through this subarea.

4. Waterfront access for viewing, fishing and boating

There is no portion of Subarea F that fronts onto Coos Bay. However, there is a significant viewshed to be considered in any development actions within Subarea F. The Tribal Cemetery affords excellent views of Coos Bay on a visual line that passes over the Kilkich Village area. CIT leadership, staff and member indicated that this view is culturally significant and should be preserved.

Constraints

1. Topography

As noted earlier in this Memorandum, Subarea F is effectively divided into three distinct zones defined by surrounding steeper slopes (see Figure 9). The Tribal Cemetery defines a fourth zone. The net result is that relatively little land left in Subarea F for potential development purposes, even before other considerations are taken into account, such as access and stream protection. Plus, these three nominally potential "development" zones are further constrained by shape and location. Figure 9 best illustrates these circumstances.

2. Known hazardous materials sites

No hazardous material sites were identified based on ODEQ records.

3. Environmental issues requiring avoidance or mitigation

As part of any development scenario, the stream corridors and riparian vegetation of Upper Fourth Creek should be protected and restored as needed. In addition, low impact development solutions should be considered, such as bio-swales, sediment traps, and different pavement types to direct, treat, and reduce storm water flows.

4. Tsunami inundation/flood zones

No portion of the Local Tsunami Evacuation Zone or any floodplain extends into Subarea F.

5. Utilities/public service infrastructure

The factors influencing the extension of public and private utility services are discussed under *Opportunities*. From the perspective of "main line" transmission and treatment, there are no known limitations arising from current regional water, sewer, or electrical power capacity. Topography and challenges in making transportation connections are potential limitations to local service water and sewer extensions.



Potential land uses, conflicts and legal or policy requirements or guidelines

Subarea F has relatively low development potential due to access issues, steep slopes and creek riparian areas. While not ideal, future residential development is feasible. The Tribal Cemetery and lands surrounding the access road are valuable CIT assets. The Tribes may consider designating the quarter-section surrounding the cemetery as a Significant Cultural Area. This would involve adoption of management criteria to allow very specific uses and improvements (similar to the 1998 Tarheel Lake Natural Area Plan).

IV. Transportation

The transportation section provides an overview of the existing roadway network within the CIT Empire Site from Wisconsin Avenue to Libby Lane and documents the opportunities as well as constraints in establishing new internal roadways to connect the sub-area parcels and new external connections. The combination of internal and external connections will help reduce trips on Cape Arago Highway while also increasing emergency access.

CIT Empire Site Roadways

In 2013, Red Plans Professional's (RPP) Indian Reservation Roads (IRR)/Tribal Transportation Plan (TTP) performed a comprehensive roadway conditions analysis for each roadway recommended for the IRR/TTP system. This inventory collected roadway conditions data on approximately 370 miles of roads eligible for the IRR/TTP system of roads noting that 13.7 miles of existing roadways currently exists within the CIT Empire Site. RPP worked with the Coquille Indian Tribe (CIT) to identify an additional 356.3 miles of future development proposed roads.

Table 1 and Figure 10 provides a list of existing gravel roadways that will be evaluated for opportunities to provide new internal connections and emergency access and circulation.

Table 1 - Existing CIT Empire Site Gravel Roadways

1. North Boundary Road
2. Wisconsin Extension Road
3. Powerline Road
4. Second Creek Access Road
5. North/South Connector Road
6. Miluk Extension
7. Tarheel Loop Road
8. Libby Lane Spur

Opportunities

The CIT Empire Site has an established network of existing paved and gravel roadways recognized by the Bureau of Indian Affairs (BIA) functional classification. Enhancing these internal roadways across the CIT Empire Site by providing continuous vehicular connections that also accommodate pedestrian and bicycle transportation will alleviate the need to utilize Cape Arago Highway for short distance, internal trips while helping to establish a network of local roads for future development and CIT needs such as emergency access.



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Figure 10 - Existing CIT Empire Site Gravel Roadways



In order to provide internal connections throughout the CIT Empire site Subareas, it is important to recognize the existing gravel roadways and less developed vehicular paths as opportunities for enhancements. **Table 2** provides a detailed overview of the existing CIT Empire Site gravel roadways under consideration for further enhancement in this comprehensive plan.

Table 2- Existing CIT Empire Site Gravel Roadway Details

<p>1. North Boundary Road (BIA Route 2400)</p> <p>The North Boundary Road is an established gravel roadway that runs from the terminus of S. Morrison Street to the north to the CIT Powerline Road to the south with a length of 0.9 miles. The North Boundary Road is owned by the BIA and classified as a rural local road with a right-of-way (ROW) width of 30'. No shoulders are currently provided and severe drainage issues have been noted.</p>	
<p>2. Wisconsin Extension Road (BIA Route 2100)</p> <p>Wisconsin Extension Road, as noted in its name, serves as an extension of Wisconsin Avenue and provides a north-south connection to the Powerline Road to the west of the North Boundary Road with a length of 0.7 miles. Wisconsin Extension Road is owned by the BIA and classified as a rural local road with a ROW width of 30'. No shoulders are currently provided and severe drainage issues have been noted.</p>	
<p>3. Powerline Road (BIA Route 2200)</p> <p>Powerline Road is a well-established, east-west gravel road that serves as an extension of Spaw Boulevard with a length of 0.8 miles. Powerline Road, as noted above provides east-west connections for roadway connections such as North Boundary Road and Wisconsin Extension Road. Powerline Road is owned by the BIA and classified as a rural local road with a ROW of 30'. No shoulders are currently provided and severe drainage has been noted.</p>	

4. Second Creek Access Road (BIA Route 2220)

Second Creek Access Road is a gravel roadway running north-south from Powerline Road to North/South Connector Road with a length of 0.6 miles. Second Creek Access Road is owned by the BIA and is classified as a rural local road with a ROW of 25'. No shoulders are currently provided and severe drainage has been noted.



5. North/South Connector Road (BIA Route 1730)

North/South Connector Road is a gravel roadway that provides the primary north-south connection between Second Creek Access Road and Miluk Extension with a length of 0.4 miles. North/South Connector Road is owned by the CIT and classified as a rural local road with a ROW width of 20'. No shoulders are currently provided and severe drainage has been noted.



6. Miluk Extension (BIA Route 1200)

Miluk Extension is a well-established gravel road that provides a north-south connection from Grinnell Avenue and North/South Connector Road to the north to Miluk Drive to the south with a length of 1.6 miles. Miluk Extension is owned by the BIA and classified as a rural major collector with a ROW width of 35'. No shoulders are currently provided and severe drainage has been noted. The Miluk Extension Bridge, which crosses over Fourth Creek appears to be in need of rehabilitation.



7. Tarheel Loop Road (BIA Route 1210)

Tarheel Loop Road is a well-established gravel road that provides internal circulation around the Tarheel Reservoir within the CIT's south parcel from Cape Arago Highway to Miluk Drive. Tarheel Loop Road is owned by the BIA and classified as a rural major collector with a length of 1.8 miles and a ROW width of 20'. No shoulders are currently provided and severe drainage has been noted.



8. Libby Lane Spur (BIA Route 4100)

Libby Lane Spur is a north-south extension of Miluk Extension with the intent of connecting Miluk Extension to Libby Lane although it does not appear that the connection is continuous. Libby Lane Spur is owned by the BIA and classified as a rural local road with a ROW width of 15' and a length of 0.1 miles. The road bed is overgrown with shrubbery and debris and severe drainage has been noted.



Multi-Modal Considerations

Establishing internal roadway connections that accommodate bicycle and pedestrian travel modes is an important part of reducing the overall number of internal vehicular trips for short-distance destinations. As future roadway connections are developed, it is important to provide the necessary right-of-way to accommodate these modes. Appropriate facilities serving to enhance bicycle and pedestrian safety may include designated shoulders; walk/biking trails or paths parallel to the roadway.

Off-Site Roadways

Six existing off-site roadways currently provide access to the CIT site as well as the internal connections to Subareas A, B, C, and D. With the potential for future development within the CIT site, these roadways have been further evaluated to determine if reasonable access to future developments could be provided while accommodating multimodal needs and emergency access. These roadways are noted below in Table 3 and illustrated in Figure 11.

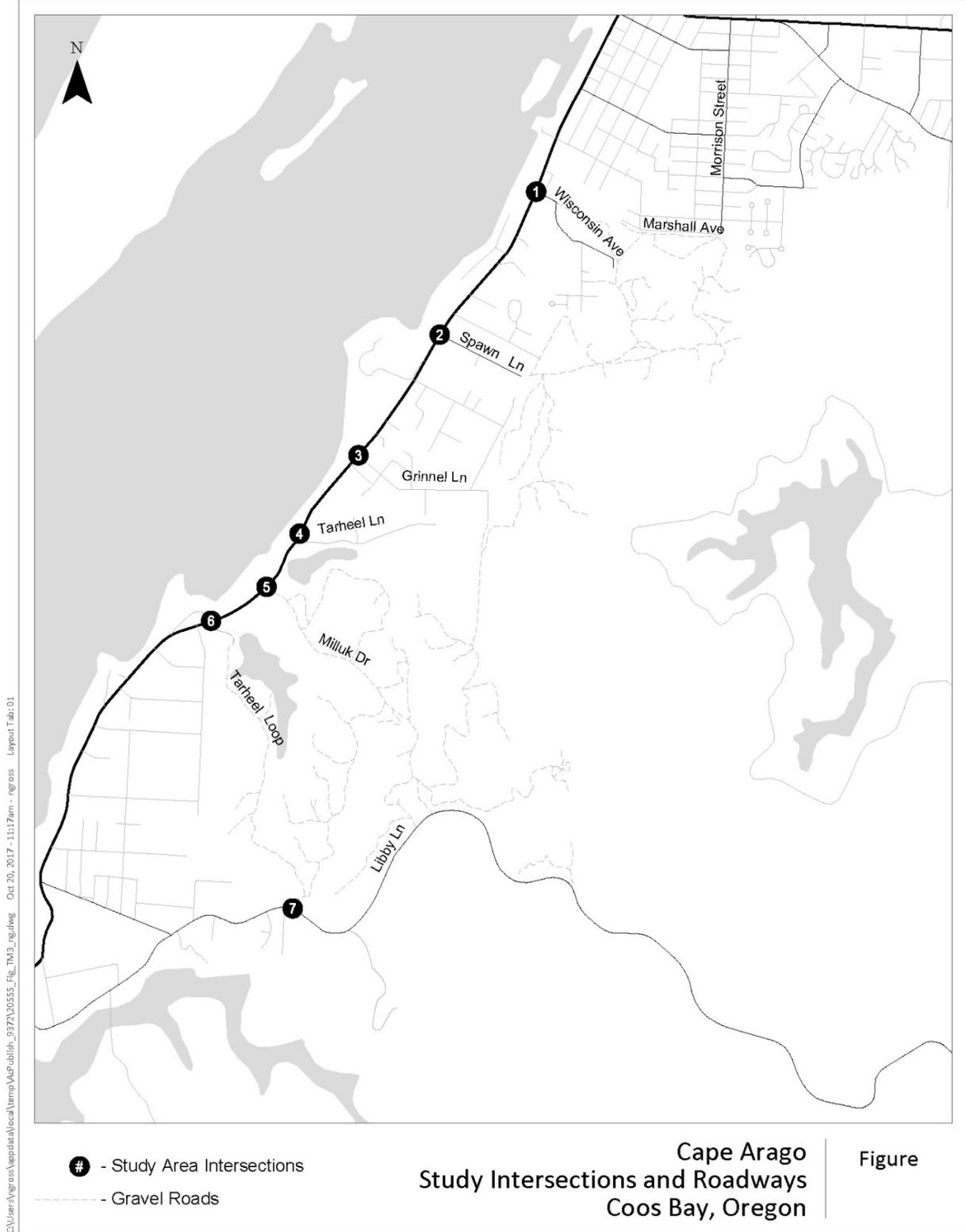


Figure 11 - Cape Arago Study Intersections and Roadways



Table 3 - Cape Arago Study Intersections and Roadways

1. Cape Arago Highway/Miluk Drive
2. Cape Arago Highway/Tarheel Lane
3. Cape Arago Highway/Spaw Lane
4. Cape Arago Highway/Grinnell Lane
5. Cape Arago Highway/Wisconsin Avenue
6. Morrison Street/Marshal Avenue
7. Libby Lane

Existing and Potential Access Roadway Characteristics

Miluk Drive

Miluk Drive is a paved road serving as the primary access to the CIT site. Miluk Drive provides access to Subarea C and points east into the CIT site. The roadway is currently classified as a rural major collector by the BIA with a right-of-way width of 24'. Miluk Drive currently has sidewalks within the CIT central area however sidewalks do not connect to Cape Arago Highway limiting the potential to access transit. Extending the existing sidewalks to Cape Arago Highway will provide a continuous connection for CIT residents to access Cape Arago Highway by foot. Miluk Drive – Miluk Extension appears to be suitable to accommodate future needs within Subarea C and points east however right-of-way is significantly limited as noted above.

Tarheel Lane

Tarheel Lane is a residential, paved road located just north of the Fourth Creek Reservoir. Tarheel Lane currently does not access the CIT site and may have limited right-of-way to expand based on the residential frontage to the north and the Four Creek Reservoir to the south. Tarheel Lane does not appear to be suitable to provided future connections to the CIT site.

Spaw Lane

Spaw Lane is a narrow residential, paved road serving local access as well as connections into Subarea B via Powerline Road. Spaw Lane is a County road, currently classified as a rural major collector by the BIA with a right-of-way of 20'. No sidewalks are provided along Spaw Lane and the right-of-way appears to be fully utilized by the adjacent parcels. Spaw Lane provides direct access into Subarea B and the Second Creek area.

Grinnell Avenue

Grinnell Avenue is a narrow residential, paved road serving local access as well as connections into Subarea B and F via. Miluk Extension. Grinnell Avenue is a County road currently classified as a rural major collector by the BIA with a right-of-way of 60'. Grinnell



Avenue does not currently provide sidewalks however multimodal accommodations could be provided within the right-of-way available. Grinnell Avenue's current roadway width is approximately 25' leaving 35' of available right-of-way for potential upgrades and future multimodal accommodations. Grinnell Avenue appears to be suitable to accommodate future needs within Subareas B and F.

Wisconsin Avenue

Wisconsin Avenue is a residential paved road which quickly becomes gravel as it transitions into Cameron Road. Wisconsin Avenue is classified as a minor arterial by the City of Coos Bay with a right-of-way of 50'. Right-of-way is currently provided within a segment of Wisconsin Extension that would provide a continuous connection from Wisconsin Avenue to the established portion of Wisconsin Extension to the east into Subarea A. Establishing this connection would allow for direct access Subarea A.

Morrison Street

Morrison Street is a residential, paved roadway serving as a primary north-south connection between Newmark Avenue to Marshal Avenue. Morrison Street is classified as an urban collector by the City of Coos Bay with a right-of-way of 24'. Morrison Street presents an opportunity to provide northern external access to Subarea A of the Coquille Indian Tribe (CIT) site by enhancing the existing connection to the BIA Northern Boundary Road. This connection could serve as a primary evacuation route as well as emergency access to Subarea A. Additional connections via Madison and Jefferson Street as well as Marshall Avenue should be explored to provide further external options into Subarea A.

Libby Lane

Libby Lane is a narrow winding roadway serving as an east-west connection between Cape Arago Highway and points east towards the unincorporated community of Libby. Libby Lane is under the jurisdiction of the County and classified as a rural local roadway with a right-of-way of 50'. Southern external access to Subarea E is currently provided by a deteriorated and overgrown roadway known as Libby Lane Spur. Enhancing this connection would provide for emergency access as well as an evacuation route.

Existing and Potential Access Roadway Summary

Wisconsin Avenue and Grinnell Avenue appear to be most suitable to accommodate future needs and emergency access into the CIT site from Cape Arago Highway. Wisconsin Avenue via Wisconsin Extension would need to be further enhanced in order to provide a continuous connection into the northern parcel of the CIT site including Subarea A and B. Grinnell Avenue via Miluk Extension currently exists however, providing enhancements to the roadway such as pavement, shoulders, and wayfinding will increase its value for residents and future development opportunities as well as emergency access.

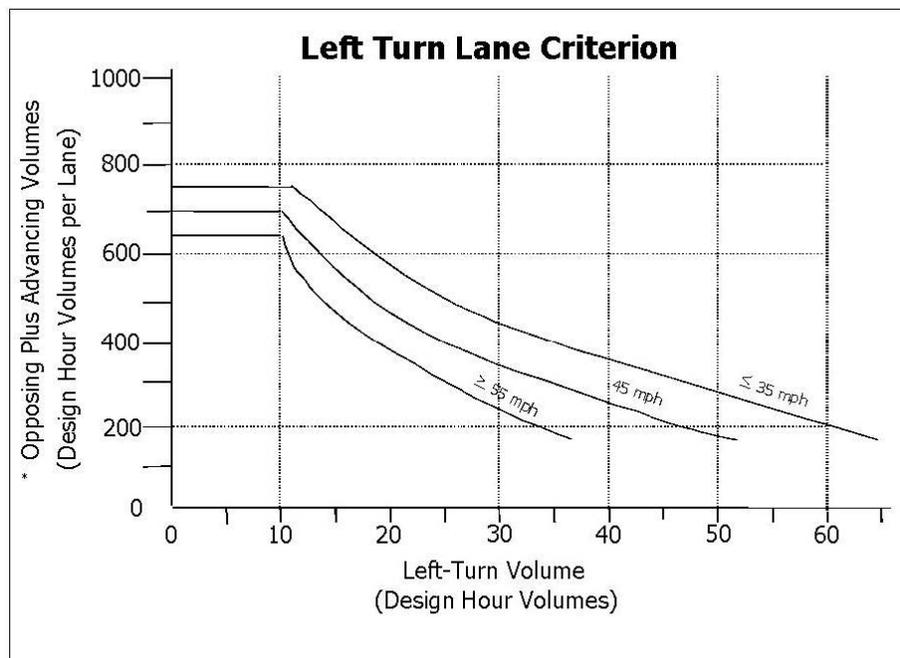


Morrison Street via. Northern Boundary Road and Libby Lane appear to be the most suitable to accommodate future needs and emergency access into the CIT site from the north (Morrison Street) and south (Libby Lane). Establishing a continuous and enhanced connection with clearly marked wayfinding signage along Northern Boundary Road via. Powerline Road would provide emergency egress as well as an evacuation route to Morrison Street and points north. Formalizing the Libby Lane Spur via. Miluk Extension would establish a southern external connection to Libby Lane from Subarea E. This relatively shortly connection (0.1 miles) would allow for emergency egress and serve as an evacuation point from subareas C, D, E, F.

Left-Turn Warrant Analysis

The need for left-turn lanes on Cape Arago Highway at potential new external connections to the CIT site was evaluated using the future forecast traffic volumes from Memo 2 (future baseline conditions, does not assume growth for the CIT property) and Criterion 1: Vehicular Volume stated by the Texas Transportation Institution (TTI) and as outlined in the Oregon Department of Transportation (ODOT) Analysis Procedures Manual (APM) Volume 1. The 45 mph curve in Exhibit 7-1 of the TTI was used to determine if the volume criterion would be met in the southbound direction for future access to the CIT Site.

Exhibit 7-1 Left-Turn Lane Criterion (TTI)



Based on the results of the lane-turn lane criterion as stated in the TTI, the following intersection(s) appear to meet the volume criterion for a left-turn lane, without any additional CIT related growth.

- Wisconsin Avenue (southbound)

A detailed look at the left-turn analysis is included in Table 4. The northbound and southbound volumes shown in Table 4 were divided by the number of lanes along Cape Arago (2) to reach the total sum used determine if left-turn criterion would be met in Exhibit 7-1 Left-Turn Lane Criterion.

Table 4: Left-Turn Lane Criterion

Street Name	Northbound/Southbound Volumes	Southbound Left-turn Volumes	Criterion Met?
Wisconsin Avenue	$(577/2 + 549/2) = 563$	27	Yes
Spaw Lane	$(541/2 + 504/2) = 522.5$	5	No
Grinnell Avenue	$(456/2 + 458/2) = 457$	21	No
Tarheel Lane	$(468/2 + 449/2) = 548.5$	8	No
Tarheel Loop	$(432/2 + 422/2) = 427$	1	No

Under the future forecast traffic volume projections, Miluk Drive and Wisconsin Avenue each have approximately 30 weekday p.m. peak hour left-turns, Grinnell Lane has approximately 20, and Spaw Lane, Tarheel Loop (Pigeon Point Loop) and Tarheel Lane each have less than 10. In order for the left-turn criterion to be met under Criterion 1: Vehicular Volume for the remaining study intersections under future forecast traffic projections, the following left-turn movements would need to increase during the p.m. peak hour.

- Spaw Lane - Approximately 20 additional southbound left-turn movements
- Grinnell Avenue - Approximately 10 additional southbound left-turn movements
- Tarheel Lane - Approximately 20 additional southbound left-turn movements
- Tarheel Loop (Pigeon Point Loop) - Approximately 30 southbound left-turn movements

The five most recent years of available crash data were further reviewed to determine the type of crash susceptible to correction by a left-turn lane (such as where a vehicle waiting to make a left-turn from a through lane was struck from the rear). Upon review, the following intersections were determined to meet Criterion 2: Crash Experience as stated in the ODOT APM Volume 1.

- Wisconsin Avenue – Three rear-end crashes occurred at the Wisconsin Avenue intersection. All three rear-end crashes occurred when a southbound vehicle was “stopped because of a left-turn signal or waiting, etc.”
- Spaw Lane – One rear-end crash occurred at the Spaw Lane intersection. This crash occurred when a southbound vehicle was “stopped because of a left-turn signal or waiting, etc.”



- Grinnell Avenue – Four rear-end crashes occurred at the Grinnell Avenue intersection. Three of the four crashes occurred when a southbound vehicle was “stopped because of a left-turn signal or waiting, etc.”
- Tarheel Lane – Four rear-end crashes occurred at the Tarheel Lane intersection. Three of the four crashes occurred when a southbound vehicle was “stopped because of a left-turn signal or waiting, etc.”
- Tarheel Loop (Pigeon Point Loop) One rear-end crash occurred at the Tarheel Loop intersection. This rear-end crash occurred when a northbound vehicle was “stopped because of a left-turn signal or waiting, etc.”

As noted above, the majority of crashes that occurred in the five most recent years of crash data available involved crashes when a southbound vehicle was waiting to make a left-turn and was rear-ended. This supports the finding that left-turn lanes are needed at potential future CIT access locations even with minimal growth.

Resilient Routes

Planning for resilient routes should be considered in the planning efforts. Resilience planning is needed for events such as storm and damage to Cape Arago, tsunami and earthquake damage, sea level rise, climate change, and other unanticipated road failures or closures.

The population island created in Subarea C by an earthquake will not only be blocked from access to Coos Bay or North Bend along Cape Arago Highway, the City of Coos Bay will be inaccessible from Libby Lane as well. Ensuring the gravel roads can connect between the North and South Parcels, or can be reconstructed should be part of the resilience plan.

Permanently connecting Miluk Drive to Libby Lane would provide a redundant transportation route in the event of a natural disaster. Connecting Morrison Street to Cape Arago and the North/South Connector Road to the South Parcel would also provide alternate routes.



Coquille Indian Tribe Comprehensive Plan

October 2017

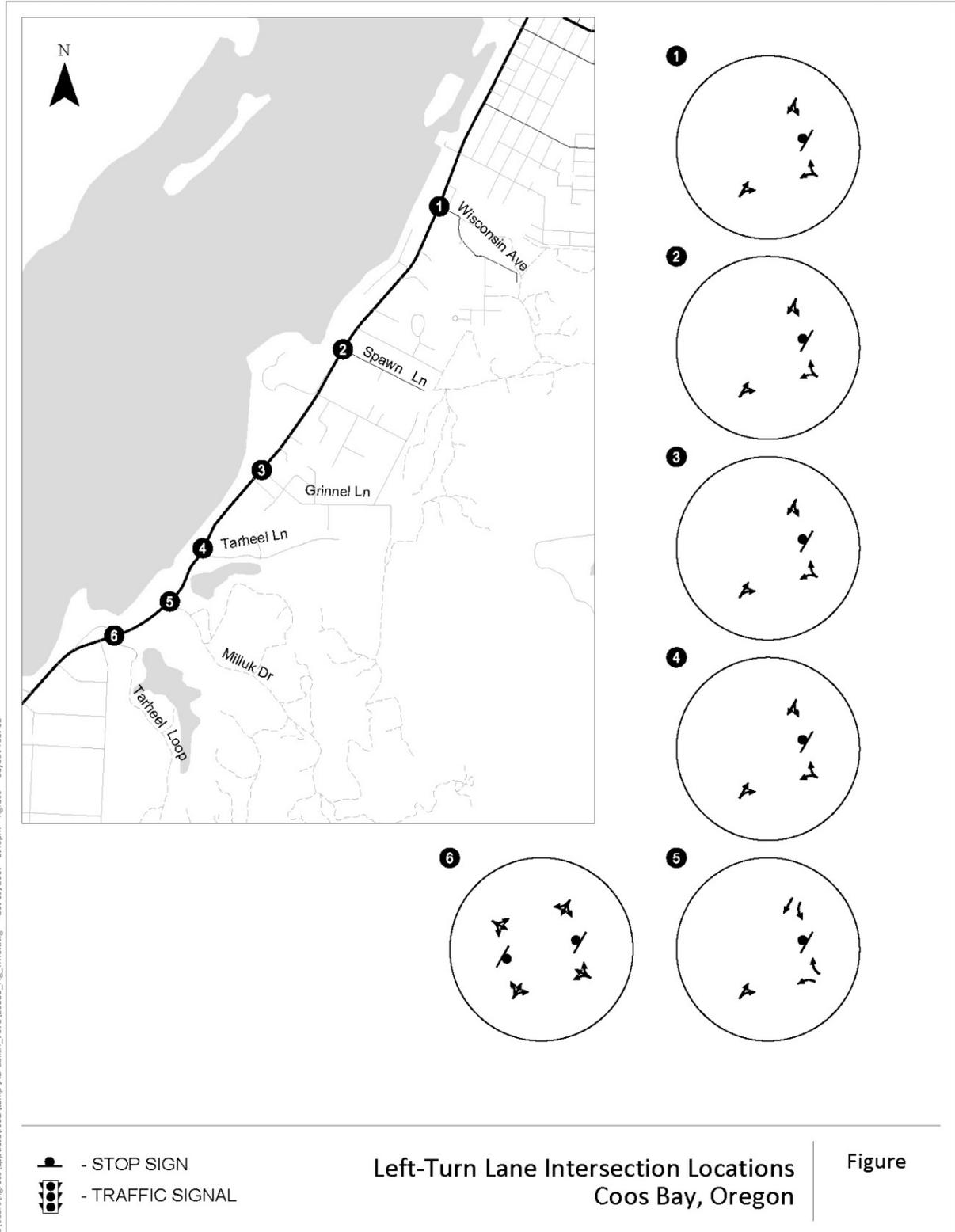


Figure 12 - Left-Turn Lane Intersection Locations



V. Next Steps

Feedback gathered at Comprehensive Plan Work Team and Tribal Council meetings will be used to refine the opportunities and constraints discussed in this Memorandum for each of the six subareas and the transportation network. This guidance will help inform the development of land use and transportation alternatives for the Empire Parcels.