# Economic Analysis of Conservation Efforts in Okanogan County

Resource Dimensions


Economics | Community Solutions | Land Use | Natural Resources | Regulatory Support

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# TABLE OF ACRONYMS

| Acronym | Definition |
|---|---|
| AUM | Animal unit month |
| CD | Conservation District |
| CPH | Cost per household |
| DNR | Department of Natural Resources, Washington State |
| DOE | Department of Ecology, Washington State |
| DOR | Department of Revenue, Washington State |
| EIS | Environmental Impact Statement |
| EMS | Emergency Medical Services |
| EPA | Environmental Protection Agency, United States |
| FTE | Full-time equivalent |
| GDP | Gross domestic product |
| GIS | Geographic information system |
| IO | Input-output |
| MLS | Minimum lot size |
| MRD | Minimum Requirement District |
| MVSTA | Methow Valley Sport Trails Association |
| NASS | National Agricultural Statistics Service, USDA |
| NRCS | National Resources Conservation Service, USDA |
| NWI | National Wetland Inventory |
| PILT | Payment-in-Lieu of Taxes |
| PIN | Parcel identification number |
| RCW | Revised Code of Washington |
| RR | Rural Residential |
| SCWA | Scotch Creek Wildlife Area |
| SD 350 | School District 350 |
| TCA | Tax Code Area |
| T&E | Threatened and endangered (species) |
| USDA | United States Department of Agriculture |
| USFWS | United States Fish & Wildlife Service |
| WAC | Washington Administrative Code |
| WDFW | Washington Department of Fish and Wildlife |
| WTP | Willingness to pay |
| WRIA | Water Resource Inventory Area |
| VF (MRD5) | Valley Floor |

# EXECUTIVE SUMMARY

## INTRODUCTION

The mission of the Washington Department of Fish and Wildlife (WDFW) is "To preserve, protect and perpetuate fish, wildlife and ecosystems while providing sustainable fish and wildlife recreational and commercial opportunities."[2] Land acquisition to conserve important fish and wildlife habitats is used by WDFW to meet this legislative mandate.[3]

The purpose of this study is to evaluate the fiscal and economic effects of WDFW-owned lands within Okanogan County (the County). The study considers WDFW-owned parcels that reside in two landscape conservation focus areas defined by WDFW as the 'Methow' and the 'Okanogan-Similkameen'. Given study parameters and constraints, our analyses pertain to a finite set of 156 'study area parcels' purchased in fee between January 1, 2008 and June 30, 2013.

Several research activities were conducted in this study:

Payment-in-Lieu of Taxes (PILT) assessments on study area parcels; synchronous assessments to private landowners by local taxing districts on study area parcels, and thus the change in revenue resulting from the change in ownership are calculated.

A customized residential build-out scenario was developed for the study area parcels. Results of this exercise are used in a comparative assessment of service costs, under current conditions and with potential future build out, for pertinent taxing districts.

The customized build-out scenario was repeated for study area parcels with water rights. In addition, potential values of agricultural production on these parcels were examined.

The economic benefits provided by all WDFW-owned lands in Okanogan County were examined through economic impact modelling and analysis. The annual values of seven important ecosystem services were assessed for the study area parcels to determine the economic value they provide to the County. Finally, we provide a systematic protocol for use by the Department during the parcel acquisition process. The worksheet protocol is designed to aid in evaluation of the fiscal and economic effects on the County due to parcel acquisition.

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[2] *WDFW, Mission and Goals. http://wdfw.wa.gov/about/mission_goals.html*
[3] *WDFW, WDFW Lands, Land Acquisition Project Proposals.http://wdfw.wa.gov/lands/acquisitions*

## PAYMENT-IN-LIEU OF TAXES AND IMPACTS TO TAXING DISTRICTS

WDFW compensates counties through PILT payments for the loss of local property taxes, which cannot be levied on state-owned lands. In Okanogan County, WDFW also pays assessments for weed control and to the Okanogan Conservation District (CD).

The acreage of contiguous parcels owned in fee by WDFW was totaled to determine if each study area parcel owned in fee by WDFW is contiguous to game lands of 100 acres or more. 138 of the 156 study area parcels are eligible for PILT payments; 18 are not.

PILT assessments on the 138 PILT-eligible study area parcels were calculated for 2009-2013 based on the County's assessment method - $0.70 per acre for 2009, the open space rate (50% of market assessed value) thereafter. PILT payments were calculated based on the State's funding history – payment of the full PILT assessment from 2009 to 2011, but payment of $0.70 per acre for PILT-eligible parcels in 2012 and 2013. Weed assessments and CD assessments were calculated using the County's method.

Table ES-1 presents a summary of PILT assessments, PILT payments, weed assessments, and CD assessments for the 138 study area parcels over the years 2009 to 2013. The total PILT assessed over this time is $117,770.75 for the study area parcels; $48,348.24 was paid. The weed assessment totaled $2,498.38 over this time for PILT-eligible parcels. The CD assessment totaled $1,990.55 over this time for PILT-eligible parcels. The total payment over the years 2009 to 2013 for PILT-eligible parcels was $52,837.17.

**Table ES-1. Assessments and Payments for PILT-Eligible Study Area Parcels (2009-2013)**

| Year | Acres | Market Value | MV 50% | PILT Assessment | PILT Paid | Weed Assessment | CD Assessment | Total Payment |
|---|---|---|---|---|---|---|---|---|
| 2009 | 2,186.51 | $ - | $ - | $1,530.56 | $1,530.56 | $218.65 | $157.06 | $1,906.27 |
| 2010 | 3,542.76 | $ 3,997,700 | $1,998,850 | $15,124.37 | $15,124.37 | $354.28 | $276.11 | $15,754.76 |
| 2011 | 4,418.62 | $ 5,798,900 | $2,899,450 | $21,308.16 | $21,308.16 | $441.86 | $363.94 | $22,113.97 |
| 2012 | 6,672.02 | $ 9,091,800 | $4,545,900 | $33,566.16 | $4,670.41 | $667.20 | $535.68 | $5,873.30 |
| 2013 | 8,163.90 | $11,806,700 | $5,903,350 | $46,241.49 | $5,714.73 | $816.39 | $657.76 | $7,188.88 |
| | | | **Total** | $117,770.75 | $48,348.24 | $2,498.38 | $1,990.55 | $52,837.17 |

*Source: Okanogan County Assessor's Office, compiled by Resource Dimensions, 2014*

For the 18 non-PILT-eligible study area parcels, the weed assessment totaled $130.23 and the CD assessment totaled $220.09 over 2009 to 2013.

The taxes assessed on study area parcels while still in private ownership from 2009 to 2013 were calculated to offer a complete view of the revenues provided by study area parcels over the study period. The taxing districts for which assessments were calculated include: County (Current Expense), Road District, Library District, School Districts, Hospital Districts, Fire Districts, Cemetery Districts, and Emergency Medical Services (EMS) Districts.

Spreadsheets were developed for each year 2009 to 2013, and study area parcels were sorted by Tax Code Area (TCA). Levy rates for each taxing district in each TCA were multiplied by the taxable value of each study area parcel residing in the TCA to determine the taxes assessed by each taxing district.

Table ES-2 presents the results of these calculations. As WDFW acquired the study area parcels, the County tax assessed declined from about $60,090 in 2009 to about $498 in 2013. The total County tax assessed on the study area parcels over 2009 to 2013 was $84,436.86. Note that when parcels are purchased by WDFW their taxable value becomes $0.

**Table ES-2. Summary – County Tax Assessed on Study Area Parcels (2009-2013)**

| District Type | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|
| County | $ 11,826.96 | $ 2,108.12 | $ 2,196.29 | $ 314.57 | $ 78.21 |
| Road | $ 12,980.10 | $ 2,314.48 | $ 2,384.85 | $ 276.63 | $ 68.77 |
| Library | $ 3,318.61 | $ 587.76 | $ 699.40 | $ 94.60 | $ 24.86 |
| School | $ 24,001.79 | $ 3,665.37 | $ 4,078.85 | $ 617.17 | $ 234.72 |
| Hospital | $ 2,615.94 | $ 567.54 | $ 570.35 | $ 120.53 | $ 34.33 |
| Fire | $ 2,697.88 | $ 647.66 | $ 659.89 | $ 617.17 | $ 39.58 |
| Cemetery | $ 228.73 | $ 72.40 | $ 67.71 | $ 2.19 | $ - |
| EMS | $ 2,419.97 | $ 567.52 | $ 544.64 | $ 73.05 | $ 17.67 |
| **Total** | $ 60,089.97 | $ 10,530.84 | $ 11,201.97 | $ 2,115.92 | $ 498.16 |

*Source: Okanogan County Assessor's Office, compiled by Resource Dimensions, 2014*

Table ES-3 summarizes County tax assessed, PILT assessed and PILT paid on the study area parcels from 2009 to 2013. Note the inverse relationship between tax assessments and PILT assessments.

**Table ES-3. Summary – Tax and PILT Assessed & PILT Paid on Study Area Parcels (2009-2013)**

| Year | County Tax Assessed | PILT Assessed | PILT Paid |
|---|---|---|---|
| 2009 | $ 60,089.97 | $ 1,530.56 | $ 1,530.56 |
| 2010 | $ 10,530.84 | $ 15,124.37 | $ 15,124.37 |
| 2011 | $ 11,201.97 | $ 21,308.16 | $ 21,308.16 |
| 2012 | $ 2,115.92 | $ 33,566.16 | $ 4,670.41 |
| 2013 | $ 498.16 | $ 46,241.49 | $ 5,714.73 |
| **Total** | $ 84,436.86 | $117,770.75 | $ 48,348.24 |

*Source: Okanogan County Assessor's Office, compiled by Resource Dimensions, 2014*

## LAND CAPACITY AND CUSTOMIZED BUILD-OUT SCENARIO

A customized build-out scenario for the study area parcels was developed through the integration of data layers within a geographic information system (GIS) platform. The customized build-out scenario is comprised of numeric build-out analyses and spatial build-out analyses.

The numeric build-out analyses calculates the theoretical maximum number of buildings (i.e. residential dwelling units), that could be built on the study area parcels, thus holding capacity based on parcel size. Various conditions were applied to the numeric build-out analyses, including: residential zoning densities; minimum lot sizes; the likelihood that a parcel may be developed (i.e. the efficiency factor for development); building footprint size; and constraints to development (i.e. wetlands and steep slopes).

The numeric build-out converts specified land use information into specific building counts from which gross and net buildable area are calculated. Before refining study area parcels with identified development constraints, the numeric build-out analysis derives a holding capacity of 2,926 total dwelling units on about 3.51 million square feet of gross buildable area. The area constrained to development reduces the gross buildable area to a net total of roughly 2.76 million square feet.

In the spatial build-out analyses, the results of the numeric build-out are refined to account for the actual geometry of land-use areas and buildings. Three specifications are included in the spatial build-out analysis: minimum building separation distances, the likely pattern of development, and road setback distances. On applying these constraints, the spatial build-out analyses derives a probability of 166 total dwelling units on the study area parcels. There are an estimated 31 existing buildings across study area parcels.

The numbers of residential dwelling units by land-use zone are reported in Table ES-4.

**Table ES-4. Customized Build-Out Scenario Summary**

| Land-Use Designation | Numeric Build-out | Spatial Build-out | Non-Buildable Difference | Existing Buildings |
|---|---|---|---|---|
| SD 350 | 25 | 10 | 15 | 16 |
| MRD | 2,883 | 155 | 2,728 | 9 |
| RR | - | - | - | 1 |
| VF (MRD5) | 18 | 1 | 17 | 5 |
| Total | 2,926 | 166 | 2,760 | 31 |

*Source: Resource Dimensions, 2014*

## COMPARATIVE COSTS ASSESSMENT

This section presents the results of three analyses: 1) the real cost to provide services in 2013 is compared to the cost to provide services to the current population plus the hypothetical new population that would result from the build-out scenario; 2) a comparison of hypothetical tax assessed on new dwelling units to PILT assessed and to PILT paid on the study area parcels; and, 3) a comparison of

hypothetical tax assessed on new dwelling units to the total cost to provide services to these new dwelling units.

Taxing districts that would provide services to new dwelling units were identified by compiling all TCAs where study area parcels with new dwelling units reside, and selecting for each individual taxing district where at least one new dwelling unit would reside. The first part of the analysis, the cost of services comparison, is conducted for these taxing districts.

To determine the current cost to provide services on a per household basis, or service cost per household (CPH), the current service area population of each taxing district in the analysis was estimated (as no reliable estimates exist). In this multi-step process, we first determined how many residential parcels exist in each taxing district, then estimated the population of each residential parcel, and finally summed the population of each residential parcel to determine the taxing district's service area population.

Total cost of services provided by each taxing district in our analysis was collected for the most recent Fiscal Year, 2013. The estimated service area population of each taxing district was divided by the County average household size (2.45 persons) to derive an estimated number of households in each taxing district. The total cost for each taxing district to provide services in 2013 was divided by the estimated number of households in that taxing district to derive an estimated service CPH.

To estimate the change in service CPH resulting from the addition of the new dwelling units to taxing districts, the number of total service area households in each taxing district was calculated. These totals are sums of the number of current households in each taxing district plus the number of new households in new dwelling units in the same taxing district. Service CPH was divided by the total service area households, by taxing district. On average, the total service CPH decreased 1.10%, not including Fire District #9 (Table ES-5).

In other words, as the number of households in the tax base increases, the cost to provide service to each household in the taxing district slightly decreases. It is important to note that this calculation assumes no added service cost to any taxing district due to adding new dwelling units for new capital facilities or other infrastructure (for example, building new roads, building a new fire station or purchasing a new fire truck). As no reliable estimates for such expenses exist, they were not included in these calculations.

**Table ES-5. Service Area Cost per Household Decrease Due to New Dwelling Units (2013)**

| Taxing District | Service Cost (2013) | Service CPH (2013) | Total Households (Current + New DUs) | Service CPH (Total Households) | Service CPH Decrease Due to New DUs |
|---|---|---|---|---|---|
| **Road District** | $ 16,226,435 | $ 967 | 16,950 | $ 957 | 0.98% |
| **Law Enforcement** | $ 7,253,242 | $ 628 | 11,711 | $ 619 | 1.42% |
| **Library District** | $ 23,845,550 | $ 263 | 90,872 | $ 262 | 0.18% |
| **Fire Districts** | | | | | |
| Fire District #4 | $ 536,000 | $ 885 | 609 | $ 881 | 0.49% |
| Fire District #6 | $ 1,590,080 | $ 689 | 2,315 | $ 687 | 0.26% |
| Fire District #9 | $ 65,746 | $ 1,401 | 101 | $ 651 | 53.50% |
| **EMS Districts** | | | | | |
| Methow Valley Rural | $ 454,773 | $ 190 | 2,404 | $ 189 | 0.46% |
| Oroville - Rural | $ 422,207 | $ 445 | 965 | $ 438 | 1.76% |
| Tonasket EMS | $ 482,719 | $ 279 | 1,759 | $ 274 | 1.48% |
| **School Districts** | | | | | |
| Omak # 19 | $ 33,558,514 | $ 11,159 | 3,061 | $ 10,962 | 1.76% |
| Okanogan #105 | $ 10,991,276 | $ 7,792 | 1,469 | $ 7,484 | 3.95% |
| Methow Valley #350 | $ 6,678,652 | $ 2,155 | 3,110 | $ 2,147 | 0.35% |
| Tonasket #404 | $ 10,798,100 | $ 6,203 | 1,767 | $ 6,112 | 1.47% |
| Oroville #410 | $ 7,566,035 | $ 4,250 | 1,797 | $ 4,209 | 0.95% |
| **Hospital Districts** | | | | | |
| Hospital District #1 | $ 12,500,000 | $ 2,329 | 5,379 | $ 2,324 | 0.20% |
| Hospital District #3 | $ 33,117,876 | $ 7,498 | 4,549 | $ 7,280 | 2.90% |
| Hospital District #4 | $ 21,162,225 | $ 5,945 | 3,583 | $ 5,907 | 0.64% |
| **Cemetery Districts** | | | | | |
| Cemetery District #1 | $ 18,455 | $ 11 | 1,717 | $ 11 | 0.23% |
| Cemetery District #2 | $ 35,195 | $ 28 | 1,249 | $ 28 | 0.56% |
| Cemetery District #4 | $ 58,861 | $ 38 | 1,579 | $ 37 | 0.89% |

*Source: Resource Dimensions, 2014*

To assess potential return from study area parcels we investigated the ratio of PILT assessed and PILT paid on the study area parcels versus the hypothetical tax that may be assessed on the new dwelling units in the second part of the analysis.

The estimated total taxable value of the new parcels where the new dwelling units would reside was multiplied by the levy rates of the taxing districts within the TCA where they would reside, to determine the total hypothetical tax assessed as a result of the new dwelling units. The total hypothetical tax that may have been assessed on the new dwelling units in 2013 is $194,276.04, assuming all 166 new dwelling units were built-out in 2013.

The PILT assessed on all eligible study area parcels in 2013 was $46,241.49. Thus, the amount of PILT assessed in 2013 is 23.8% of the hypothetical taxes that would have been assessed in 2013. The PILT

paid on all Study Area parcels in 2013 was $5,714.73. The amount of PILT paid in 2013 is 2.9% of the hypothetical taxes that would have been assessed in 2013 (Table ES-6).

**Table ES-6. Comparison of Hypothetical Tax Assessed to PILT Assessed and to PILT Paid**

| Total Hypothetical Tax Assessed on 'New' Dus | PILT Assessed on Study Area parcels | PILT Paid on Study Area parcels | PILT Assessed / Hypothetical Tax Assessed | PILT Paid / Hypothetical Tax Assessed |
|---|---|---|---|---|
| $ 194,276.04 | $ 46,241.49 | $ 5,714.73 | 23.80% | 2.94% |

*Source: Resource Dimensions, 2014*

In reality, there would be costs associated with serving new dwelling units. In this third part of the analysis, we calculated the increase in total service cost to provide services to the new dwelling units to better understand this relationship.

The number of new dwelling units in each taxing district was multiplied by the service CPH for each taxing district to derive a total service cost for the new dwelling units in that taxing district. This value was added to the 2013 service cost for the taxing district, to calculate an adjusted service cost reflecting the new dwelling units being added to each taxing district. The adjusted service cost was divided by the current service cost to calculate the percent increase in total service cost due to the new dwelling units, by taxing district.

The cost to provide services to the new dwelling units totals $2,767,140 (Table ES-7). On average, the service cost for all taxing districts increased 1.08%, not including Fire District #9. The hypothetical tax assessed on the new dwelling units is $194,276. Thus, the hypothetical tax assessed is about 7% of the cost to provide services to the new dwelling units.

**Table ES-7. Total Service Cost Increase Due to New Dwelling Units**

| Taxing District | New DUs | Service CPH (Total Service Area Households) | Total Service Cost for New DUs | Adjusted Service Cost with New DUs | Service CPH Increase Due to New DUs |
|---|---|---|---|---|---|
| **Road District** | 166 | $ 957 | $ 158,917 | $ 16,385,352 | 0.97% |
| **Law Enforcement** | 166 | $ 619 | $ 102,813 | $ 7,356,055 | 1.40% |
| **Library District** | 166 | $ 262 | $ 43,560 | $ 23,889,110 | 0.18% |
| **Fire Districts** | | | | | |
| Fire District #4 | 3 | $ 881 | $ 2,642 | $ 538,642 | 0.49% |
| Fire District #6 | 6 | $ 687 | $ 4,121 | $ 1,594,201 | 0.26% |
| Fire District #9 | 54 | $ 651 | $ 35,173 | $ 100,919 | 34.85% |
| **EMS Districts** | | | | | |
| Methow Valley Rural | 11 | $ 189 | $ 2,081 | $ 456,854 | 0.46% |
| Oroville - Rural | 17 | $ 438 | $ 7,440 | $ 429,647 | 1.73% |
| Tonasket EMS | 26 | $ 274 | $ 7,135 | $ 489,854 | 1.46% |
| **School Districts** | | | | | |
| Omak # 19 | 54 | $ 10,962 | $ 591,949 | $ 34,150,463 | 1.73% |
| Okanogan #105 | 58 | $ 7,484 | $ 434,079 | $ 11,425,355 | 3.80% |
| Methow Valley #350 | 11 | $ 2,147 | $ 23,621 | $ 6,702,273 | 0.35% |
| Tonasket #404 | 26 | $ 6,112 | $ 158,902 | $ 10,957,002 | 1.45% |
| Oroville #410 | 17 | $ 4,209 | $ 71,560 | $ 7,637,595 | 0.94% |
| **Hospital Districts** | | | | | |
| Hospital District #1 | 11 | $ 2,324 | $ 25,562 | $ 12,525,562 | 0.20% |
| Hospital District #3 | 132 | $ 7,280 | $ 960,963 | $ 34,078,840 | 2.82% |
| Hospital District #4 | 23 | $ 5,907 | $ 135,860 | $ 21,298,085 | 0.64% |
| **Cemetery Districts** | | | | | |
| Cemetery District #1 | 4 | $ 11 | $ 43 | $ 18,498 | 0.23% |
| Cemetery District #2 | 7 | $ 28 | $ 197 | $ 35,392 | 0.56% |
| Cemetery District #4 | 14 | $ 37 | $ 522 | $ 59,383 | 0.88% |
| **Total** | | | $ 2,767,140 | | |

*Source: Resource Dimensions, 2014*

## ASSESSMENT OF WATER RIGHTS RETENTION

To identify if water right records existed on the study area parcels and what information they contain, all study area parcels were searched using the Washington State Department of Ecology's web-based application, Water Resources Explorer. 46 total records were found on 31 study area parcels.

Three questions relating to water rights were analyzed: (1) the potential residential development of the parcels with water rights; (2) the potential agricultural use of each parcel with a water right; and (3) the potential gross value of tree fruit production on irrigated acres of parcels with water rights.

The customized build-out scenario was repeated to calculate the number of residential dwelling units that may be placed on the 31 parcels with water right records. The numeric build-out analysis calculated a holding capacity of 800 dwelling units. After further refinement, the spatial build-out analysis calculated a holding capacity of 57 dwelling units (Table ES-8).

**Table ES-8. Build-out Analysis Summary, Study Area Parcels with Water Rights**

| Land-Use Designation | Numeric Build-Out | Spatial Build-Out | Non-Buildable Difference | Existing Buildings |
|---|---|---|---|---|
| SD 350 | 12 | 3 | 9 | 10 |
| MRD | 776 | 53 | 723 | 2 |
| VF (MR D5) | 12 | 1 | 11 | 2 |
| **Total** | 800 | 57 | 743 | 14 |

*Source: Resource Dimensions, 2014*

The potential agricultural use of each parcel with a water right record was evaluated through a two-step process. First, each parcel was visually assessed for items including topography, elevation, land cover and current agricultural use. Second, water right information obtained from the Water Resources Explorer database was examined to determine if it reflects visual conditions. Note that the majority of real-world aspects of agricultural production were not considered in this assessment.

Potentially 13 of the 31 parcels could be used as rangeland only. Six parcels have potential agricultural use for either grass (hay) farming or as rangeland. Five parcels have potential use for grass farming. Three parcels have potential use for tree fruit farming, and one parcel has potential for either tree fruit farming or grass farming. Water right records for three parcels indicate there is no potential for their agricultural use (i.e. the purpose is for domestic general use only or power only).

The water rights records on the 31 study area parcels reflect 1,117.2 irrigated acres total. To calculate the potential gross value of tree fruit production, average historic yields were multiplied by average historic prices. To derive these values, almost all real-world aspects of tree fruit farming are not considered; this is solely a high-level view of potential gross values of tree fruit production. Three production scenarios are considered: sweet cherries, commercial apples and Bartlett pears. The percent of non-bearing acres were estimated to refine estimated gross values of production.

Table ES-9 presents a summary of the estimated total tons of production and estimated gross values of production for the three fruit types. The estimated gross value of production for commercial apples is about $12.1 million, about $12.6 million for sweet cherries, and about $9.5 million for Bartlett pears.

**Table ES-9. Summary – Fruit Production Scenarios, 2013**

| Fruit Type | Estimated total tons of production | Price per ton | Estimated gross value of production |
|---|---|---|---|
| Apples | 18,093.48 | $ 666 | $ 12,050,258 |
| Cherries, Sweet | 4,860.69 | $ 2,592 | $ 12,598,908 |
| Pears, Bartlett | 15,041.46 | $ 629 | $ 9,461,078 |

*Source: Resource Dimensions, 2014*

## ECONOMIC IMPACTS OF ACTIVITIES ON WDFW LANDS IN OKANOGAN COUNTY

Various activities on WDFW-owned lands provide an economic impact to Okanogan County. These activities include public recreation, continued agricultural uses such as crop leases and grazing permits, and the presence of restoration projects. We conservatively quantified these economic impacts using IMPLAN 3.0 software, an economic impact model. Note that this section of the study considers activities on all WDFW-owned lands in Okanogan County.

Table ES-10 summarizes the economic impact of continued agriculture (i.e. grazing permits and crop leases) on WDFW lands in Okanogan County. Model results indicate that this agricultural activity generated $148,062 in direct output in the County. Considering indirect and induced effects, the total economic impact of continued agriculture on WDFW lands in the County is estimated at $235,883 (2013 dollars). This economic activity supported an estimated 2.8 jobs, with labor earnings of $82,421.

**Table ES-10. Economic Impact of Continued Agriculture on WDFW Lands in Okanogan County**

| Impact Type | Direct Effect | Indirect Effect | Induced Effect | Total Effect |
|---|---|---|---|---|
| Output | $ 148,062 | $ 51,456 | $ 36,365 | $ 235,883 |
| Employment | 1.8 | 0.6 | 0.3 | 2.8 |
| Income | $ 60,107 | $ 12,744 | $ 9,570 | $ 82,421 |
| Value Added | $ 80,588 | $ 23,869 | $ 22,220 | $ 126,678 |

*Source: Resource Dimensions, 2014*

Model results indicate that restoration project-related activity generated $2,154,410 in direct output in Okanogan County (Table ES-11). Considering indirect and induced effects, the total economic impact of restoration project-related activity on WDFW lands in the County is estimated to be $3,167,226 (2013 dollars). This economic activity supported an estimated 51.4 jobs with labor earnings of $1,409,140.

**Table ES-11. Economic Impact of Restoration Projects on WDFW Lands in Okanogan County**

| Impact Type | Direct Effect | Indirect Effect | Induced Effect | Total Effect |
|---|---|---|---|---|
| Output | $ 2,154,410 | $ 386,852 | $ 625,964 | $ 3,167,226 |
| Employment | 42.0 | 4.0 | 5.4 | 51.4 |
| Income | $ 1,139,230 | $ 105,159 | $ 164,751 | $ 1,409,140 |
| Value Added | $ 1,355,032 | $ 203,941 | $ 382,499 | $ 1,941,473 |

*Source: Resource Dimensions, 2014*

The economic impact analysis for recreation on the SCWA consisted of inputting the employment and spending data into the Okanogan County model, using standard IMPLAN values for the government employment, retail stores, and lodging sectors in Okanogan County. For public recreation use, we analyzed a case study of three recreation types in the Scotch Creek Wildlife Area (SCWA). The estimated total expenditures for angling, hunting and wildlife viewing on the SCWA are $113,556.

Model results indicate that recreation on the SCWA generated $58,696 in direct output in Okanogan County (Table ES-12). Considering indirect and induced effects, the total economic impact of recreation on the SCWA in 2012 is estimated to be $84,192 (2013 dollars). This economic activity supported about 1.2 jobs with labor earnings of $38,637.

**Table ES-12. Economic Impact of Recreation Use of the Scotch Creek Wildlife Area**

| Impact Type | Direct Effect | Indirect Effect | Induced Effect | Total Effect |
|---|---|---|---|---|
| Output | $ 58,696 | $ 8,461 | $ 17,035 | $ 84,192 |
| Employment | 1.0 | 0.1 | 0.1 | 1.2 |
| Income | $ 32,088 | $ 2,066 | $ 4,483 | $ 38,637 |
| Value Added | $ 43,888 | $ 4,818 | $ 10,409 | $ 59,115 |

*Source: Resource Dimensions, 2014*

## ECONOMIC CONTRIBUTIONS OF CONSERVED LANDS

Conservation of land and its appurtenant resources provides economic benefits to Okanogan County through a multitude of ecosystem services – the products and services produced by the environment. Ecosystem services provided by natural processes, aesthetic values and non-consumptive resource use can affect the fiscal health of a community through reducing costs. We took an abridged look at the value of ecological services and resulting economic benefits produced by conserved lands under the ownership of WDFW within Okanogan County, on the study area parcels.

Given the limitations of this study, our focus was on a finite subset of services. Generally, the categories of ecosystem services valued in this study include provisioning, regulating and societal/cultural services. Ecosystem services values estimated are: (1) terrestrial habitat (total economic value is recreational use and passive use value); (2) wetlands (habitat, flood control, nature-based recreation, aesthetic enjoyment/amenity, erosion control, water supply, and the regulation of water quality); and (3) aquatic habitat (nonuse values only).

A meta-analyses function benefit transfer approach is used to estimate certain economic values associated with WDFW conservation efforts in the County (see Section 7.4). Fundamentally, estimates available from other studies, particularly those employing primary data that have been completed in a similar context are adapted for use. This method produces lower transfer errors and is well-suited to valuing diverse policy sites because the value function can be applied to a database containing site-specific information.

To estimate the study area parcel acreage categorized as wetland, terrestrial and aquatic resources, parcels and pertinent layers were mapped using GIS. The total acreage of the study area parcels is 8,504.83 acres. Total acreage of aquatic resources is 66.52 acres; the total acreage of wetland resources is 1,307.4 acres; and the remainder of the acreage is terrestrial.

Table ES-13 reflects the estimated total economic value of the contributions provided to Okanogan County, and beyond, by the 8,504 acres of study area parcels that comprise a component of the Department's conservation land holdings within the county. Together and conservatively, the annual value of the services assessed for the study area parcels represents just over $65 million.

**Table ES-13. Summary of Economic Contributions provided by Study Area Parcels (2013 $U.S. Dollars)**

| Resource Type | Acres | Total/Unit $ Contribution | Unit of Measure | Annual Economic Contribution |
|---|---|---|---|---|
| Wetlands | 1,307.40 | $ 2,802 | per acre | $ 3,663,700 |
| Terrestrial Lands | 7,130.91 | $ 8,593 | per acre | $ 61,275,910 |
| Aquatic (lakes, rivers, streams)* | 66.52 | $ 98 | per household | $ 290,157 |
| Total | 8,504.83 | | | $ 65,229,767 |

*Source: Resource Dimensions, 2014*

## ASSESSING FUTURE ACQUISITIONS

A *Parcel Acquisition Assessment System* is provided to estimate the fiscal and economic effects of potential land acquisitions on Okanogan County. This system is designed to analyze one parcel at a time, guiding the user through a similar process to that used this study, though on a much smaller scale.

The system is comprised of three spreadsheet layers, contained within one Excel® spreadsheet. It guides the user in scoring the favorability, to the County, of fiscal and economic impacts of parcel acquisition. Impacts are divided into categories; each category contains one or more attributes. Attributes of each category may be 'favorably' to 'unfavorably' affected as a result of parcel acquisition by WDFW. Categories are then assigned a score based on favorability. Scores are tallied and compared to a key that can be used to gauge how acquisition of the parcel may affect the County fiscally and economically.

Categories include: the number of new dwelling units that may be placed on the parcel; the potential PILT assessment on the parcel; the potential hypothetical tax assessed on the parcel; how total costs of

services change as the result of adding new dwelling units on the parcel; the value of ecosystem services provided by the parcel; potential effects on industries within the county due to changing the current use of the parcel; land use planning aspects of potential private development of the parcel; if the parcel has water rights, and if so, what is the residential development potential and potential agricultural production on the parcel; and the economic impacts of activities on the parcel if it is acquired by WDFW.

# SECTION ONE: INTRODUCTION

## 1.1 PURPOSE AND BACKGROUND

The mission of the Washington Department of Fish and Wildlife (WDFW) is "To preserve, protect and perpetuate fish, wildlife and ecosystems while providing sustainable fish and wildlife recreational and commercial opportunities."[4] Land acquisition to conserve important fish and wildlife habitats is used by WDFW to meet this legislative mandate.[5]

The purpose of this study is to evaluate the fiscal and economic effects of WDFW-owned lands within Okanogan County (the County). The majority of the study considers WDFW-owned parcels (i.e. the 'study area parcels') that reside in two landscape conservation focus areas defined by WDFW. The geographic location of the study area parcels fall into three defined regions, or subareas, of the County. Throughout the study we refer to these regions as the Mazama-Carlton subarea, the Tonasket-Omak subarea, and the Nighthawk subarea. Data limitations and other constraints set the study period for those parcels acquired by WDFW between January 1, 2008 and June 30, 2013.

The impact of private lands converting to public ownership has been a hotly debated topic in the United States. From questions centered on local tax base impacts, to those tied to land as a major factor of production in classical economics (together with labor and capital) and an essential input for housing and food production, the effects of public land ownership on local economies have faced much scrutiny.

Increasingly, conservation lands held by public agencies are being viewed within the larger context of meeting long-term goals to sustain regional biodiversity, support habitat protection and recovery, protect air and water resources, and provide adequate resource lands to meet diverse recreation demand. Within the County, WDFW is engaged with diverse partners in both regional and international stewardship initiatives to protect habitat, conserve biodiversity, etc. To accomplish these goals in alignment with its mission WDFW has acquired and managed key lands in the County.

This analysis investigates Payment-in-Lieu of Taxes (PILT) assessments on study area parcels, synchronous assessments by local taxing districts on study area parcels when still in private ownership, and thus the change in payments resulting from a change in ownership of study area parcels (Section 2).

A customized residential build-out scenario is developed for the study area parcels (Section 3). Build-out scenario results are used in a comparative assessment of service costs, under current conditions and with potential future build out, for pertinent taxing districts (Section 4). In Section 5,

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[4] *WDFW, Mission and Goals. http://wdfw.wa.gov/about/mission_goals.html*

[5] *WDFW, WDFW Lands, Land Acquisition Project Proposals. http://wdfw.wa.gov/lands/acquisitions*

the effects of retention of water rights for the study area parcels are assessed through both a customized build-out scenario and an examination of potential values of tree fruit production.

We also examine the economic impacts and contributions of WDFW-owned lands in the County through economic impact and ecosystem service valuation measures (Sections 6 and 7). Finally, we provide an assessment system for WDFW's use in considering the fiscal and economic effects on the County due to conservation land acquisitions by WDFW (Section 8).

## 1.2 PROJECT OVERVIEW

Explained in more detail below are the various areas of research.

### 1.2.1 Payment-in-Lieu of Taxes (PILT)

Lands owned by WDFW are tax-exempt. To compensate counties for the loss of local property taxes on these parcels, WDFW provides PILT payments, in addition to payments on local assessments. We calculate the PILT, weed, and Okanogan Conservation District (CD) assessments on study area parcels.

### 1.2.2 Taxes Assessed on Study Area Parcels by Taxing District

WDFW acquired lands throughout the study period. Prior to WDFW acquisition, private landowners were assessed property taxes. We calculate these tax assessments to study area parcels within the study period.

### 1.2.3 Customized Build-Out Scenario for Study Area Parcels

A customized build-out scenario was developed to estimate the number of single-family residential dwellings that could be placed on the study area parcels. This exercise assumes that study area parcels were not acquired by WDFW, but instead were developed by private landowners.

The customized build-out scenario was a two-step process. First, a numeric build-out analysis was conducted to determine the theoretical maximum projection for the number of residential dwelling units that may be built on the study area parcels, based on the holding capacity of the lands. Second, a spatial build-out analysis was performed. Factors such as building separation and setback distances, likely pattern of development, etc., were applied to the prior results, yielding a hypothetical number of residential dwelling units.

### 1.2.4 Cost of Services Provided by Local Taxing Districts

Build-out scenario results were used to assess hypothetical impacts to local taxing districts. The estimated current cost of providing services per household (CPH), is compared to the hypothetical service CPH, based on the build-out scenario.

We also compare current PILT assessments to hypothetical tax assessments on the study area parcels, if they instead were developed as in the build-out scenario.

### 1.2.5 Water Rights

Three analyses are used to evaluate study area parcels retaining water rights. First, a customized build-out scenario is constructed using the same method as previous. Second, the potential agricultural use of parcels with water rights records is visually assessed. Finally, the potential gross value of tree fruit production was calculated on the study area parcels with reported irrigated acres.

### 1.2.6 Economic Impacts of Activities on WDFW-Owned Lands

WDFW-owned lands provide for a wide range of activities, such as public recreation, agricultural production, and restoration projects that generate diverse economic activity in Okanogan County. We conservatively quantify these economic impacts to the County, on all WDFW-owned lands in the County. Note that this section considers **all WDFW-owned lands in the County**, not just the study area parcels.

### 1.2.7 Economic Values and Contributions of Study Area Parcels

Ecosystem services provide vital functions for sustaining life. These services are provided at no cost to taxpayers. The annual values of seven important ecosystem services (flood control, water quality, water supply, recreation, habitat, erosion control and aesthetic amenity) are assessed for the study area parcels using available data and value transfer methods to determine their economic contributions to the County.

### 1.2.8 Consideration of Fiscal and Economic Impacts of Potential Land Transactions

A parcel acquisition assessment system is provided to estimate the fiscal and economic effects on the County of potential land transactions. Results derived through application of the protocol may be used in parcel acquisition considerations.

## 1.3 STUDY AREA PARCELS

The two landscape conservation focus areas, as defined by WDFW, are the 'Methow' (which includes parcels in the Methow Watershed), and the 'Okanogan-Similkameen' (which includes parcels southwest of the City of Omak north to around the unincorporated place of Nighthawk).

A list of transactions occurring between July 1, 2000 and June 30, 2013 in each landscape conservation focus area was provided by WDFW. These lands were acquired by WDFW through a fee simple purchase, or, are subject to a conservation easement that WDFW entered into with a participating private landowner.

Each transaction stated the grantor of a set of parcels, the WDFW-assigned acquisition number of the parcels[6], the date the acquisition was recorded, and the combined acreage of the acquisition. There were 43 acquisitions in the Methow landscape conservation focus area; 35 were fee simple

[6] *The acquisition number of the transaction is assigned by the WDFW Real Estate Office. The transaction itself may include one or more parcels.*

acquisitions and eight were conservation easements. There were 24 acquisitions in the Okanogan-Similkameen landscape conservation focus area; 18 were fee simple acquisitions and six were conservation easements.

WDFW provided property deeds corresponding with the acquisition numbers. Property deeds were assessed to determine the parcel identification numbers (PINs) of all parcels included in the transactions. PINs were cross-referenced against the Okanogan County parcel coverage (land use) file to verify acreage and collect other information on each parcel.[7]

In sum, there are 424 parcels – 146 parcels in the Methow landscape conservation focus area and 278 in the Okanogan-Similkameen landscape conservation focus area – included in the list of transactions provided by WDFW.

Table 1 presents the summary of acquisitions by type and date for the list of transactions. In the Methow landscape conservation focus area 81 parcels were purchased fee simple between July 1, 2000 and December 31, 2007, 41 parcels were purchased fee simple between January 1, 2008 and June 30, 2013. 24 parcels were placed under conservation easements between July 1, 2000 and June 30, 2013. In the Okanogan-Similkameen landscape conservation focus area 41 parcels were purchased fee simple between July 1, 2000 and December 31, 2007, 115 parcels were purchased fee simple between January 1, 2008 and June 30, 2013. 122 parcels were placed under conservation easements between July 1, 2000 and June 30, 2013.

**Table 1. Summary, Acquisitions by Type and Date**

| | Fee simple Purchase | | Conservation Easement | |
|---|---|---|---|---|
| **Landscape Conservation Focus Area (total parcels)** | 1/1/00 to 12/31/07 | 1/1/08 to 6/30/13 | 1/1/00 to 12/31/07 | 1/1/08 to 6/30/13 |
| **Total (424)** | 122 | 156 | 62 | 84 |
| Methow (146) | 81 | 41 | 13 | 11 |
| Okanogan-Similkameen (278) | 41 | 115 | 49 | 73 |

*Source: Resource Dimensions, 2014*

## 1.4 SCOPE AND LIMITATIONS

Given study parameters and constraints, our analyses pertain to a finite set of 156 study area parcels purchased in fee between January 1, 2008 and June 30, 2013. Data, such as taxable values, are not electronically available for the years 2000 through 2007, thus precluding calculations involving these years.[8] Further, lands on which WDFW holds a conservation easement remain in

[7] *Okanogan County GIS, Available Digital Data, 'Parcel Coverage'. December 9, 2013 file. http://www.okanogancounty.org/planning/data.htm*

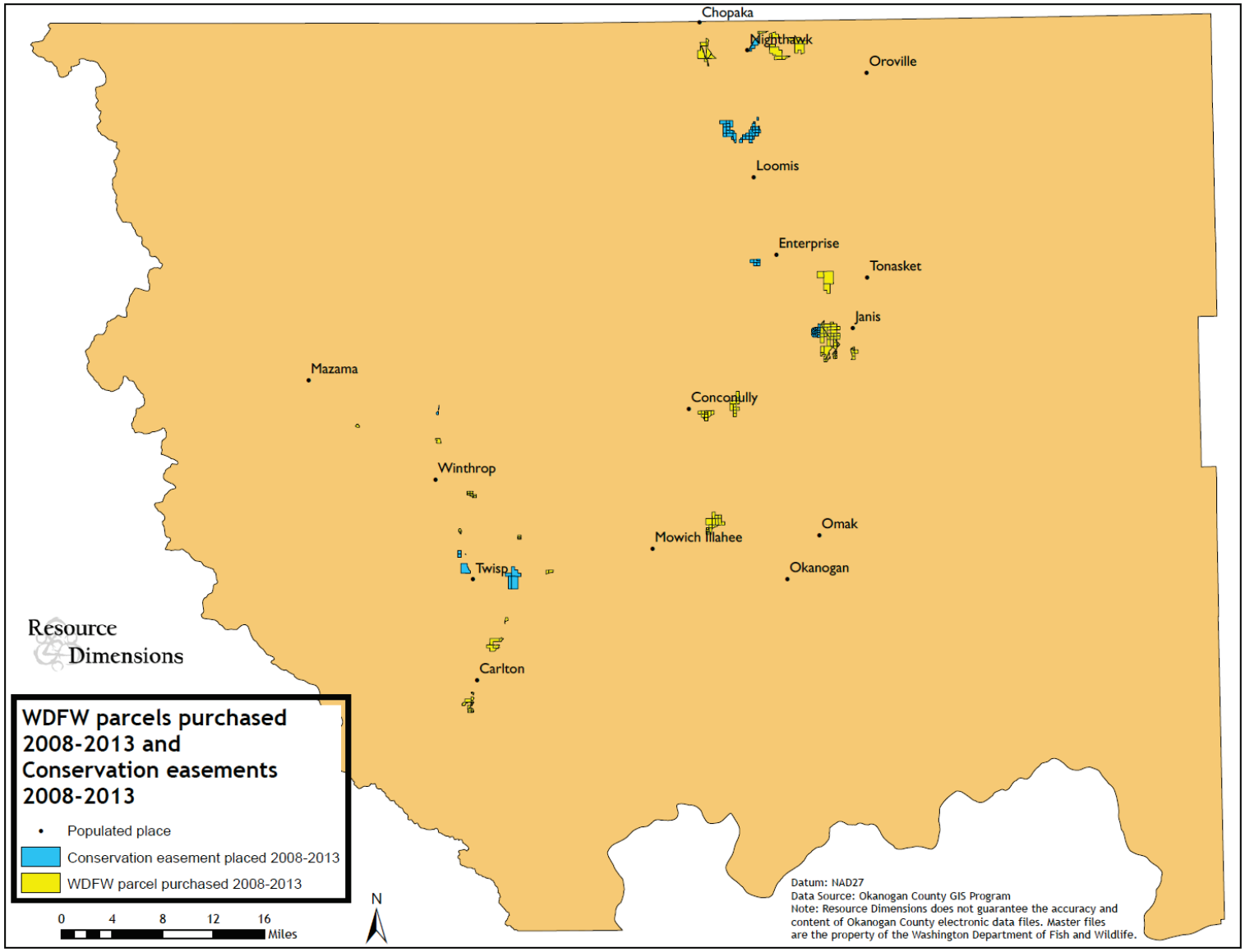
[8] *S. Furman. Okanogan County Assessor, electronic communication, December 9, 2013.*

private ownership, and thus are on County tax rolls. Therefore, these lands are not part of the constituent analysis.

Figure 1 displays the 156 study area parcels and the 84 parcels placed under a conservation easement between January 1, 2008 and June 30, 2013.

Throughout the study we identify limitations in assessing economic impact, values, benefits and contribution measurements and other social values. There are several ways to examine the economic attributes of natural lands and system functions when evaluating land management decisions. Equity issues, intergenerational issues, and how one identifies standing are but a few examples.

**Figure 1: WDFW parcels purchased and parcels placed under conservation easement (2008-2013)**



# SECTION TWO: TAXES, PAYMENT-IN-LIEU & TAXING DISTRICT IMPACTS

## 2.1 INTRODUCTION

The legislature provides funding passed through WDFW to compensate counties through PILT payments for the loss of local property taxes, which cannot be levied on state-owned lands. WDFW also pays assessments on lands it owns. WDFW pays PILT assessments and assessments for weed control and for natural resource conservation to Okanogan County.

Counties electing to receive PILT payments may calculate PILT assessments using one of three options defined by statute. Revised Code of Washington (RCW) 77.12.203(1) directs WDFW to pay on game lands "*an amount in lieu of real property taxes equal to that amount paid on similar parcels of open space land taxable under chapter 84.34 RCW or the greater of seventy cents per acre per year or the amount paid in 1984 plus an additional amount for control of noxious weeds equal to that which would be paid if such lands were privately owned. This amount shall not be assessed or paid on department buildings, structures, facilities, game farms, fish hatcheries, tidelands, or public fishing areas of less than one hundred acres.*"[9] RCW 77.12.203(2) defines 'game lands' as "*those tracts one hundred acres or larger owned in fee by the department* [WDFW] *and used for wildlife habitat and public recreational purposes.*"[10] Note that in the 2014 Regular Legislative Session, the Washington State Legislature passed SSB 6446, concerning PILT. This legislation "removes the minimum size restriction of 100 acres or larger" on game lands. Implications of this change are discussed for the pertinent study area parcels in Section 2.4.

As an alternative to assessing PILT, counties may elect to retain game violation fines, forfeitures, reimbursements, and costs assessed and collected by WDFW within their borders (per RCW 77.12.201).[11] As Okanogan County does not elect this alternative, it is not analyzed in this study.

## 2.2 DETERMINING PILT-ELIGIBLE PARCELS

To determine the portion of the 156 study area parcels that qualify as game lands, and are thus PILT-eligible, we used Okanogan County's MapSifter, a web-based application.[12] MapSifter allows users to visually zoom in on a parcel and identify, in conjunction with Okanogan County's TaxSifter web-

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[9] *RCW 77.12.203. In lieu payments authorized-Procedure-Game lands defined. http://apps.leg.wa.gov/RCW/default.aspx?cite=77.12.203. Accessed January 16, 2014.*
[10] *Ibid.*
[11] *RCW 77.12.201. Counties may elect to receive an amount in lieu of taxes – County to record collections for violations of law or rules – Deposit. http://apps.leg.wa.gov/RCW/default.aspx?cite=77.12.201*
[12] *Okanogan County MapSifter: http://okanoganwa.mapsifter.com/default.aspx*

based application, certain attributes of the parcel, including its acreage and ownership.[13] MapSifter also allows users to select contiguous parcels, and thus their acreage and ownership.

All study area parcel PINs were entered into MapSifter to identify the ownership of contiguous parcels. The acreage of contiguous parcels owned in fee by WDFW was totaled to determine if each study area parcel owned in fee by WDFW is contiguous to game lands of 100 acres or more. 138 of the 156 study area parcels were eligible for PILT assessments over 2009 to 2013.

Eighteen (18) study area parcels were not eligible for PILT assessments over 2009 to 2013 because they were not contiguous to game lands of 100 acres or more. However, per RCW 79.44.010, weed assessments and CD assessments are paid on these parcels.[14]

## 2.3 PILT Assessment Formulas for Okanogan County since 2000

PILT assessments (and weed and CD assessments) on an individual parcel begin the calendar year after it is purchased by WDFW. For example, for a parcel purchased by WDFW March 1, 2014 the first year the PILT assessment, the weed assessment and the CD assessment would be paid on the parcel is 2015. PILT assessments (and weed assessments and CD assessments) are not prorated.[15] However, the seller of the parcel owes property taxes up to the date of the sale to WDFW.

For the 2000, 2001, 2002 and 2003 calendar years, the County calculated the PILT assessments predicated on the purchase date, using two formulas. For those parcels purchased by WDFW on or prior to December 31, 1984 PILT assessments were calculated based on the levy rate of the Tax Code Area (TCA) where the parcel resides. For those parcels purchased after December 31, 1984, PILT assessments were calculated based on acreage, at seventy cents ($0.70) per acre. Weed assessments were calculated at $0.10 per acre for every parcel, regardless of acquisition date.

In 2004, the County changed its PILT assessment calculation. Starting for the 2004 PILT assessment and continuing through the 2009 PILT assessment, the County calculated PILT assessments based on acreage, at $0.70 per acre (i.e. "*seventy cents per acre per year*"). In contrast to previous years, PILT assessments, regardless of the parcel purchase date, were calculated based on this rate.

Weed assessments continued to be calculated at $0.10 per acre over this time, for every parcel. Starting in 2006 CD assessments were calculated on every WDFW parcel. The CD assessment calculation is $2.40 per parcel plus four cents ($0.04) per acre. For example, for a 40-acre parcel the CD assessment is $4.00.

In 2010, the County again changed its PILT assessment calculation. Starting for the 2010 assessment, and continuing each year through the 2013 PILT assessment, the County calculated PILT

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[13] *Okanogan County TaxSifter: http://okanoganwa.taxsifter.com/Search/Results.aspx*
[14] *RCW 79.44.010. Lands subject to local assessments. http://apps.leg.wa.gov/RCW/default.aspx?cite=79.44.010. Accessed January 16, 2014.*
[15] *S. Furman, Okanogan County Assessor, telephonic communication, December 19, 2013.*

assessments based on the "Open Space" classification (i.e. "*equal to that amount paid on similar parcels of open space land*"*)*. This classification rate is defined by the Okanogan County Assessor's Office as fifty percent (50%) of the market assessed value of a given parcel for a given year. PILT assessments for 2010 through 2013 were calculated based on this rate, regardless of the parcel purchase date.

The open space rate of 50% of market assessed value was multiplied by an adjusted rate. The adjusted rate is the total levy rate of the TCA where a parcel resides, less the State levy rate.[16] Weed assessments and CD assessments for years 2010 through 2013 were calculated as in previous years.

For example, PIN 4025170010, purchased by WDFW in 2012, resides in TCA 442, and was first eligible for a PILT assessment in 2013. This parcel is 394.28 acres, and had a market assessed value of $340,400.00 in 2013.

50% percent of market assessed value is $170,200.00. The 2013 total levy rate for TCA 442 is 11.240919%. Subtracting the 2013 State levy rate of 2.481016% yields a PILT assessment rate of 8.759903%.[17] Thus, the PILT assessed on this parcel for 2013 is $1,490.94 ($170,200.00*0.008759903). The weed assessment for 2013 is $39.43, and the CD assessment for 2013 is $18.17.

### PILT Payments by the State

During the 2011 State Legislative Session, the Legislature fixed the amount of PILT paid to each county for the years 2012 and 2013 based on the PILT rate paid in 2009 ($0.70 per acre).[18] In 2013, the State Legislature again fixed the amount of PILT paid for 2014 and 2015 based on the PILT rate paid in 2009.

## 2.4 SUMMARY: CALCULATION OF ASSESSMENTS

PILT assessments on the 138 PILT-eligible study area parcels were calculated for 2009-2013 based on the County's methodology - $0.70 per acre for 2009, the Open Space rate thereafter. PILT payments were calculated based on the State's funding history – payment of the PILT assessment from 2009 to 2011, but payment of $0.70 per acre for PILT-eligible parcels in 2012 and 2013. Weed assessments and CD assessments were calculated using the County's methodology.

Table 2 presents a summary of PILT assessments, PILT payments, weed assessments, and CD assessments for the 138 study area parcels over the years 2009 to 2013. The total PILT assessed over this time is $117,770.75 for the study area parcels; $48,348.24 was paid. The weed assessment totaled $2,498.38 over this time for PILT-eligible parcels. The CD assessment totaled $1,990.55 over

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[16] *S. Furman, Okanogan County Assessor, electronic communication, December 10, 2013.*
[17] *Ibid. The Okanogan County Assessor's Office deducts the State levy from the PILT assessment rate to avoid having the State paying PILT, and then the County having to reimburse them for the same payment.*
[18] *RCW 77.12.203(5). http://apps.leg.wa.gov/RCW/default.aspx?cite=77.12.203. Accessed January 16, 2014.*

this time for PILT-eligible parcels. The total payment over the years 2009 to 2013 for PILT-eligible parcels was $52,837.17.

**Table 2. Assessments and Payments for PILT-Eligible Study Area Parcels (2009-2013)**

| Year | Acres | Market Value | MV 50% | PILT Assessment[1] | PILT Paid[2] | Weed Assessment | CD Assessment | Total Payment |
|---|---|---|---|---|---|---|---|---|
| 2009 | 2,186.51 | $ - | $ - | $1,530.56 | $1,530.56 | $218.65 | $157.06 | $1,906.27 |
| 2010 | 3,542.76 | $ 3,997,700 | $ 1,998,850 | $15,124.37 | $15,124.37 | $354.28 | $276.11 | $15,754.76 |
| 2011 | 4,418.62 | $ 5,798,900 | $ 2,899,450 | $21,308.16 | $21,308.16 | $441.86 | $363.94 | $22,113.97 |
| 2012 | 6,672.02 | $ 9,091,800 | $ 4,545,900 | $33,566.16 | $4,670.41 | $667.20 | $535.68 | $5,873.30 |
| 2013 | 8,163.90 | $ 11,806,700 | $ 5,903,350 | $46,241.49 | $5,714.73 | $816.39 | $657.76 | $7,188.88 |
| | | | **Total** | $117,770.75 | $48,348.24 | $2,498.38 | $1,990.55 | $52,837.17 |

*Source: Resource Dimensions, 2014*

[1]/ Starting with the 2010 payments, the Okanogan County Assessor's Office changed to calculating PILT assessment using the "Open Space" classification.

[2]/ PILT payments by the State for 2012 and 2013 were based on the rate of $0.70 per acre. S. Furman, Okanogan County Assessor, telephonic communication, December 9, 2013.

PILT payment distribution by the County follows RCW 77.12.203(4) which states "*the county shall distribute the amount received under this section in lieu of real property taxes to all property taxing districts except the state in appropriate tax code areas the same way it would distribute local property taxes from private property.*"[19][20]

Table 3 presents a summary of weed assessments and CD assessments from 2009 to 2013 for the 18 study area parcels that do not qualify for PILT assessments over 2009 to 2013. The weed assessment totaled $130.23 for the non-PILT eligible parcels; the CD assessment totaled $220.09. Note that these two assessments would have been the same regardless of ownership (and thus there would have been no change in payment).

**Table 3. Assessments and Payments for Non-PILT-Eligible Study Area Parcels (2009-2013)**

| Year | # of Parcels | Acres | Weed Assessment | CD Assessment | Total Payment |
|---|---|---|---|---|---|
| 2009 | 5 | 91.25 | $9.13 | $15.65 | $24.78 |
| 2010 | 13 | 257.79 | $25.78 | $41.51 | $67.29 |
| 2011 | 16 | 276.34 | $27.63 | $49.45 | $77.09 |
| 2012 | 18 | 338.45 | $33.85 | $56.74 | $90.58 |
| 2013 | 18 | 338.45 | $33.85 | $56.74 | $90.58 |
| | | **Total** | $130.23 | $220.09 | $350.32 |

[19] *Ibid.*

[20] *L. McCormick, Okanogan County Treasurer, telephonic communication, January 17, 2014.*

*Source: Resource Dimensions, 2014*

As previously mentioned, in the 2014 Regular Legislative Session, the Washington State Legislature passed SSB 6446, concerning PILT. This legislation "removes the minimum size restriction of 100 acres or larger" on game lands.[21] Thus, all study area parcels will be eligible for PILT assessments once the bill takes effect on July 1, 2015.[22] The first year that PILT can be paid on the currently ineligible study area parcels is 2016.

Using the Open Space method as previously described, if those 18 study parcels currently PILT-ineligible were instead eligible for PILT as they will be in 2015, the PILT assessment on their total 338.45 acres would have been $6,881.24 (the weed assessment and CD assessment are unchanged). This figure was calculated using the Open Space rate (50% of the 2013 market assessed values) and the 2013 levy rates for the State and the TCAs where the parcels reside.

## 2.5 ASSESSED TAXES: RELATIONSHIP OF STUDY AREA PARCELS TO TAXING DISTRICTS

Taxes assessed on the 156 study area parcels from 2009 to 2013 while still in private ownership were calculated to offer a complete view of the revenues provided by these lands over the study period. The TCA where each study area parcel resides is included in the Parcel Coverage layer downloadable from the Okanogan County, Office of Planning and Development, Geographic Information Systems (GIS) Division (Okanogan County GIS).[23]

The taxing districts for which assessments were calculated include: County (Current Expense), Road District, Library District, School Districts, Hospital Districts, Fire Districts, Cemetery Districts, and Emergency Medical Services (EMS) Districts.

To calculate the taxes assessed we used the levy rates for each taxing district available from the Okanogan County Assessor's Office website.[24] These rate tables list the taxing districts and levy rates by TCA. All levy rates for each TCA where at least one study area parcel resides were back-calculated to ensure accuracy.

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[21] *Washington House of Representatives, Office of Program Research. Preliminary Summary of Legislation Passed by the Washington State Legislature. 2014 Regular Legislative Session. 2013 3rd Special Legislative Session. http://leg.wa.gov/House/Committees/Documents/sinedie2014.pdf*

[22] *Washington House of Representatives, House Committee on Agriculture & Natural Resources. House Bill Report SSB 6446. http://apps.leg.wa.gov/documents/billdocs/2013-14/Pdf/Bill%20Reports/House/6446-S%20HBR%20AGNR%2014.pdf*

[23] *Okanogan County GIS, Available Digital Data, 'Parcel Coverage'. December 9, 2013 file. http://www.okanogancounty.org/planning/data.htm*

[24] *Okanogan County Assessor's Office, Levies and Taxes. http://www.okanogancounty.org/Assessor/levtax.htm*

Taxable values[25] for each study area parcel were provided by two sources. Taxable values for the year 2009 were furnished by the Okanogan County Assessor's Office. Taxable values for the years 2010, 2011, 2012 and 2013 were collected using TaxSifter (Assessor tab, Historical Valuation Info section, 'Taxable' column).

The taxable value of each parcel is determined by the Okanogan County Assessor's Office, and is based on land use classification.[26] For example, a parcel that can only be used for rangeland has a lower taxable value than a parcel of equal acreage that is used for a single family residence.

Spreadsheets were developed for each year 2009 to 2013, and study area parcels were sorted by TCA. Levy rates for each taxing district in each TCA were multiplied by the taxable value of each study area parcel residing in the TCA to determine the taxes assessed by each taxing district.

## 2.6 SUMMARY: TAX ASSESSMENTS, 2009-2013

Each study area parcel resides in one of 15 TCAs. The following section presents taxes assessed by each type of taxing district, aggregated by all study area parcels within a TCA.

[25] *'Taxable value', as employed by Okanogan County, is the amount on which real property is taxed. In contrast, 'market' or 'market assessed value' is the Okanogan County Assessor's Office market-based valuation of real property. Source: S. Furman, Okanogan County Assessor, telephonic communication, December 19, 2013.*
[26] *Ibid.*

### 2.6.1 County

All study area parcels reside in the County. Taxes assessed on study area parcels by the County declined from a total of $11,826.96 in 2009 to $78.21 in 2013 (Table 4).

**Table 4. County Levy Rates and Assessments summary (2009-2013)**

| 2009-2013 County Levy Rates and Assessments | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | |
| TCA | Levy Rate | Tax Assessed | Levy Rate | Tax Assessed | Levy Rate | Tax Assessed | Levy Rate | Tax Assessed | Levy Rate | Tax Assessed |
| 312 | 1.341427 | $ 489.22 | 1.324111 | $ - | 1.235117 | $ - | 1.416354 | $ - | 1.419496 | $ - |
| 313 | 1.341427 | $ 145.01 | 1.324111 | $ - | 1.235117 | $ - | 1.416354 | $ - | 1.419496 | $ - |
| 314 | 1.341427 | $ 434.09 | 1.324111 | $ 0.79 | 1.235117 | $ 143.64 | 1.416354 | $ 154.95 | 1.419496 | $ - |
| 341 | 1.341427 | $ 472.99 | 1.324111 | $ 427.29 | 1.235117 | $ 419.20 | 1.416354 | $ - | 1.419496 | $ - |
| 343 | 1.341427 | $ 3,511.32 | 1.324111 | $ 941.97 | 1.235117 | $ 990.69 | 1.416354 | $ - | 1.419496 | $ - |
| 442 | 1.341427 | $ 583.79 | 1.324111 | $ 160.22 | 1.235117 | $ 103.75 | 1.416354 | $ 81.58 | 1.419496 | $ - |
| 448 | 1.341427 | $ 37.56 | 1.324111 | $ - | 1.235117 | $ - | 1.416354 | $ - | 1.419496 | $ - |
| 451 | 1.341427 | $ 258.76 | 1.324111 | $ 267.60 | 1.235117 | $ 249.62 | 1.416354 | $ 78.04 | 1.419496 | $ 78.21 |
| 453 | 1.341427 | $ 155.20 | 1.324111 | $ 153.20 | 1.235117 | $ 142.90 | 1.416354 | $ - | 1.419496 | $ - |
| 454 | 1.341427 | $ 278.21 | 1.324111 | $ 35.35 | 1.235117 | $ 32.98 | 1.416354 | $ - | 1.419496 | $ - |
| 455 | 1.341427 | $ 1,793.62 | 1.324111 | $ 117.71 | 1.235117 | $ 109.80 | 1.416354 | $ - | 1.419496 | $ - |
| 512 | 1.341427 | $ 1,221.37 | 1.324111 | $ - | 1.235117 | $ - | 1.416354 | $ - | 1.419496 | $ - |
| 601 | 1.341427 | $ 656.49 | 1.324111 | $ - | 1.235117 | $ - | 1.416354 | $ - | 1.419496 | $ - |
| 606 | 1.341427 | $ 1,079.98 | 1.324111 | $ - | 1.235117 | $ - | 1.416354 | $ - | 1.419496 | $ - |
| 915 | 1.341427 | $ 709.35 | 1.324111 | $ 3.97 | 1.235117 | $ 3.71 | 1.416354 | $ - | 1.419496 | $ - |
| | | $ 11,826.96 | | $ 2,108.12 | | $ 2,196.29 | | $ 314.57 | | $ 78.21 |

*Source: Okanogan County, compiled by Resource Dimensions, 2014*

### 2.6.2 Road District

All study area parcels reside in the Road District. Taxes assessed on study area parcels by the Road District declined from a total of $12,980.10 in 2009 to $68.77 in 2013 (Table 5).

**Table 5. Road District Levy Rates and Assessments summary (2009-2013)**

| 2009-2013 Road District Levy Rates and Assessments | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | |
| TCA | Levy Rate | Tax Assessed | Levy Rate | Tax Assessed | Levy Rate | Tax Assessed | Levy Rate | Tax Assessed | Levy Rate | Tax Assessed |
| 312 | 1.472217 | $ 536.92 | 1.453725 | $ - | 1.341158 | $ - | 1.245531 | $ - | 1.248138 | $ - |
| 313 | 1.472217 | $ 159.15 | 1.453725 | $ - | 1.341158 | $ - | 1.245531 | $ - | 1.248138 | $ - |
| 314 | 1.472217 | $ 476.41 | 1.453725 | $ 0.87 | 1.341158 | $ 155.98 | 1.245531 | $ 136.26 | 1.248138 | $ - |
| 341 | 1.472217 | $ 519.10 | 1.453725 | $ 469.12 | 1.341158 | $ 455.19 | 1.245531 | $ - | 1.248138 | $ - |
| 343 | 1.472217 | $ 3,853.68 | 1.453725 | $ 1,034.18 | 1.341158 | $ 1,075.74 | 1.245531 | $ - | 1.248138 | $ - |
| 442 | 1.472217 | $ 640.71 | 1.453725 | $ 175.90 | 1.341158 | $ 112.66 | 1.245531 | $ 71.74 | 1.248138 | $ - |
| 448 | 1.472217 | $ 41.22 | 1.453725 | $ - | 1.341158 | $ - | 1.245531 | $ - | 1.248138 | $ - |
| 451 | 1.472217 | $ 283.99 | 1.453725 | $ 293.80 | 1.341158 | $ 271.05 | 1.245531 | $ 68.63 | 1.248138 | $ 68.77 |
| 453 | 1.472217 | $ 170.34 | 1.453725 | $ 168.20 | 1.341158 | $ 155.17 | 1.245531 | $ - | 1.248138 | $ - |
| 454 | 1.472217 | $ 305.34 | 1.453725 | $ 38.81 | 1.341158 | $ 35.81 | 1.245531 | $ - | 1.248138 | $ - |
| 455 | 1.472217 | $ 1,968.50 | 1.453725 | $ 129.24 | 1.341158 | $ 119.23 | 1.245531 | $ - | 1.248138 | $ - |
| 512 | 1.472217 | $ 1,340.45 | 1.453725 | $ - | 1.341158 | $ - | 1.245531 | $ - | 1.248138 | $ - |
| 601 | 1.472217 | $ 720.50 | 1.453725 | $ - | 1.341158 | $ - | 1.245531 | $ - | 1.248138 | $ - |
| 606 | 1.472217 | $ 1,185.28 | 1.453725 | $ - | 1.341158 | $ - | 1.245531 | $ - | 1.248138 | $ - |
| 915 | 1.472217 | $ 778.51 | 1.453725 | $ 4.36 | 1.341158 | $ 4.02 | 1.245531 | $ - | 1.248138 | $ - |
| | | $ 12,980.10 | | $ 2,314.48 | | $ 2,384.85 | | $ 276.63 | | $ 68.77 |

*Source: Okanogan County, compiled by Resource Dimensions, 2014*

### 2.6.3 Library District

All study area parcels reside in the Library District (i.e. the North Central Regional Library system). Taxes assessed on study area parcels by the Library District declined from a total of $3,318.61 in 2009 to $24.86 in 2013 (Table 6).

**Table 6. Library District Levy Rates and Assessments summary (2009-2013)**

| 2009-2013 Library District Levy Rates and Assessments | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | |
| TCA | Levy Rate | Tax Assessed | Levy Rate | Tax Assessed | Levy Rate | Tax Assessed | Levy Rate | Tax Assessed | Levy Rate | Tax Assessed |
| 312 | 0.3764 | $ 137.27 | 0.36917 | $ - | 0.39332 | $ - | 0.42592 | $ - | 0.451156 | $ - |
| 313 | 0.3764 | $ 40.69 | 0.36917 | $ - | 0.39332 | $ - | 0.42592 | $ - | 0.451156 | $ - |
| 314 | 0.3764 | $ 121.80 | 0.36917 | $ 0.22 | 0.39332 | $ 45.74 | 0.42592 | $ 46.60 | 0.451156 | $ - |
| 341 | 0.3764 | $ 132.72 | 0.36917 | $ 119.13 | 0.39332 | $ 133.49 | 0.42592 | $ - | 0.451156 | $ - |
| 343 | 0.3764 | $ 985.26 | 0.36917 | $ 262.63 | 0.39332 | $ 315.48 | 0.42592 | $ - | 0.451156 | $ - |
| 442 | 0.3764 | $ 163.81 | 0.36917 | $ 44.67 | 0.39332 | $ 33.04 | 0.42592 | $ 24.53 | 0.451156 | $ - |
| 448 | 0.3764 | $ 10.54 | 0.36917 | $ - | 0.39332 | $ - | 0.42592 | $ - | 0.451156 | $ - |
| 451 | 0.3764 | $ 72.61 | 0.36917 | $ 74.61 | 0.39332 | $ 79.49 | 0.42592 | $ 23.47 | 0.451156 | $ 24.86 |
| 453 | 0.3764 | $ 43.55 | 0.36917 | $ 42.71 | 0.39332 | $ 45.51 | 0.42592 | $ - | 0.451156 | $ - |
| 454 | 0.3764 | $ 78.07 | 0.36917 | $ 9.86 | 0.39332 | $ 10.50 | 0.42592 | $ - | 0.451156 | $ - |
| 455 | 0.3764 | $ 503.28 | 0.36917 | $ 32.82 | 0.39332 | $ 34.97 | 0.42592 | $ - | 0.451156 | $ - |
| 512 | 0.3764 | $ 342.71 | 0.36917 | $ - | 0.39332 | $ - | 0.42592 | $ - | 0.451156 | $ - |
| 601 | 0.3764 | $ 184.21 | 0.36917 | $ - | 0.39332 | $ - | 0.42592 | $ - | 0.451156 | $ - |
| 606 | 0.3764 | $ 303.04 | 0.36917 | $ - | 0.39332 | $ - | 0.42592 | $ - | 0.451156 | $ - |
| 915 | 0.3764 | $ 199.04 | 0.36917 | $ 1.11 | 0.39332 | $ 1.18 | 0.42592 | $ - | 0.451156 | $ - |
| | | $ 3,318.61 | | $ 587.76 | | $ 699.40 | | $ 94.60 | | $ 24.86 |

*Source: Okanogan County, compiled by Resource Dimensions, 2014*

### 2.6.4 School Districts

Study area parcels reside in one of five school districts: 19, 105, 350, 404, or 410. Taxes assessed on study area parcels by these school districts declined from a total of $24,001.79 in 2009 to $234.72 in 2013 (Table 7).

**Table 7. School Districts Levy Rates and Assessments summary (2009-2013)**

| 2009-2013 School Districts Levy Rates and Assessments | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | |
| TCA | Levy Rate | Tax Assessed | Levy Rate | Tax Assessed | Levy Rate | Tax Assessed | Levy Rate | Tax Assessed | Levy Rate | Tax Assessed |
| 312 | 1.680489 | $ 612.87 | 1.712191 | $ - | 1.685507 | $ - | 1.763811 | $ - | 2.128737 | $ - |
| 313 | 1.680489 | $ 181.66 | 1.712191 | $ - | 1.685507 | $ - | 1.763811 | $ - | 2.128737 | $ - |
| 314 | 1.680489 | $ 543.81 | 1.712191 | $ 1.03 | 1.685507 | $ 196.02 | 1.763811 | $ 192.96 | 2.128737 | $ - |
| 341 | 1.680489 | $ 592.54 | 1.712191 | $ 552.52 | 1.685507 | $ 572.06 | 1.763811 | $ - | 2.128737 | $ - |
| 343 | 1.680489 | $ 4,398.85 | 1.712191 | $ 1,218.05 | 1.685507 | $ 1,351.95 | 1.763811 | $ - | 2.128737 | $ - |
| 442 | 4.24968 | $ 1,849.46 | 3.394406 | $ 410.72 | 3.76409 | $ 316.18 | 3.76409 | $ 216.81 | 4.259977 | $ - |
| 448 | 4.24968 | $ 118.99 | 3.394406 | $ - | 3.76409 | $ - | 3.76409 | $ - | 4.259977 | $ - |
| 451 | 4.24968 | $ 819.76 | 3.394406 | $ 686.01 | 3.76409 | $ 760.72 | 3.76409 | $ 207.40 | 4.259977 | $ 234.72 |
| 453 | 4.24968 | $ 491.69 | 3.394406 | $ 392.73 | 3.76409 | $ 435.51 | 3.76409 | $ - | 4.259977 | $ - |
| 454 | 4.24968 | $ 881.38 | 3.394406 | $ 90.63 | 3.76409 | $ 100.50 | 3.76409 | $ - | 4.259977 | $ - |
| 455 | 4.24968 | $ 5,682.25 | 3.394406 | $ 301.76 | 3.76409 | $ 334.63 | 3.76409 | $ - | 4.259977 | $ - |
| 512 | 3.934297 | $ 3,582.18 | 4.837237 | $ - | 5.745411 | $ - | 6.051371 | $ - | 5.864300 | $ - |
| 601 | 1.872922 | $ 916.61 | 1.190904 | $ - | 2.310313 | $ - | 2.45505 | $ - | 2.919241 | $ - |
| 606 | 1.872922 | $ 1,507.89 | 1.190904 | $ - | 2.310313 | $ - | 2.45505 | $ - | 2.919241 | $ - |
| 915 | 3.445256 | $ 1,821.85 | 3.968151 | $ 11.90 | 3.760692 | $ 11.28 | 3.407405 | $ - | 4.662630 | $ - |
| | | $ 24,001.79 | | $ 3,665.37 | | $ 4,078.85 | | $ 617.17 | | $ 234.72 |

*Source: Okanogan County, compiled by Resource Dimensions, 2014*

### 2.6.5 Hospital Districts

Study area parcels reside in one of three hospital districts: 1, 3, or 4. Taxes assessed on study area parcels by these hospital districts declined from a total of $2,615.94 in 2009 to $34.33 in 2013 (Table 8).

**Table 8. Hospital Districts Levy Rates and Assessments summary (2009-2013)**

| 2009-2013 Hospital Districts Levy Rates and Assessments | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | |
| TCA | Levy Rate | Tax Assessed | Levy Rate | Tax Assessed | Levy Rate | Tax Assessed | Levy Rate | Tax Assessed | Levy Rate | Tax Assessed |
| 312 | 0.279982 | $ 102.11 | 0.280449 | $ - | 0.241271 | $ - | 0.591271 | $ - | 0.62312 | $ - |
| 313 | 0.279982 | $ 30.27 | 0.280449 | $ - | 0.241271 | $ - | 0.591271 | $ - | 0.62312 | $ - |
| 314 | 0.279982 | $ 90.60 | 0.280449 | $ 0.17 | 0.241271 | $ 28.06 | 0.591271 | $ 64.69 | 0.62312 | $ - |
| 341 | 0.279982 | $ 98.72 | 0.280449 | $ 90.50 | 0.241271 | $ 81.89 | 0.591271 | $ - | 0.62312 | $ - |
| 343 | 0.279982 | $ 732.88 | 0.280449 | $ 199.51 | 0.241271 | $ 193.52 | 0.591271 | $ - | 0.62312 | $ - |
| 442 | 0.37867 | $ 164.80 | 0.358753 | $ 43.41 | 0.362562 | $ 30.46 | 0.382242 | $ 22.02 | 0.374384 | $ - |
| 448 | 0.181044 | $ 5.07 | 0.6 | $ - | 0.606335 | $ - | 0.613941 | $ - | 0.320764 | $ - |
| 451 | 0.181044 | $ 34.92 | 0.6 | $ 121.26 | 0.606335 | $ 122.54 | 0.613941 | $ 33.83 | 0.62312 | $ 34.33 |
| 453 | 0.181044 | $ 20.95 | 0.6 | $ 69.42 | 0.606335 | $ 70.15 | 0.613941 | $ - | 0.62312 | $ - |
| 454 | 0.37867 | $ 78.54 | 0.358753 | $ 9.58 | 0.362562 | $ 9.68 | 0.317932 | $ - | 0.374384 | $ - |
| 455 | 0.37867 | $ 506.32 | 0.358753 | $ 31.89 | 0.362562 | $ 32.23 | 0.317932 | $ - | 0.374384 | $ - |
| 512 | 0.181044 | $ 164.84 | 0.6 | $ - | 0.606335 | $ - | 0.613941 | $ - | 0.62312 | $ - |
| 601 | 0.37867 | $ 185.32 | 0.358753 | $ - | 0.362562 | $ - | 0.382242 | $ - | 0.374384 | $ - |
| 606 | 0.37867 | $ 304.87 | 0.358753 | $ - | 0.362562 | $ - | 0.382242 | $ - | 0.374384 | $ - |
| 915 | 0.181044 | $ 95.74 | 0.6 | $ 1.80 | 0.606335 | $ 1.82 | 0.613941 | $ - | 0.62312 | $ - |
| | | $ 2,615.94 | | $ 567.54 | | $ 570.35 | | $ 120.53 | | $ 34.33 |

*Source: Okanogan County, compiled by Resource Dimensions, 2014*

### 2.6.6 Fire Districts

68 study area parcels reside in one of three fire districts: #4, #6 or #9. Taxes assessed on these study area parcels by these fire districts declined from a total of $2,697.88 in 2009 to $39.58 in 2013 (Table 9). Study area parcels that do not reside in a fire district are not included in this calculation.

**Table 9. Fire Districts Levy Rates and Assessments summary (2009-2013)**

| 2009-2013 Fire Districts Levy Rates and Assessments | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | |
| TCA | Levy Rate | Tax Assessed | Levy Rate | Tax Assessed | Levy Rate | Tax Assessed | Levy Rate | Tax Assessed | Levy Rate | Tax Assessed |
| 312 | 0.0 | $ - | 0.0 | $ - | 0.0 | $ - | 0.0 | $ - | 0.0 | $ - |
| 313 | 0.668235 | $ 72.24 | 0.674916 | $ - | 0.537334 | $ - | 0.601776 | $ - | 0.606056 | $ - |
| 314 | 0.668235 | $ 216.24 | 0.674916 | $ 0.40 | 0.537334 | $ 62.49 | 0.601776 | $ 192.96 | 0.606056 | $ - |
| 341 | 0.0 | $ - | 0.0 | $ - | 0.0 | $ - | 0.0 | $ - | 0.0 | $ - |
| 343 | 0.668235 | $ 1,749.17 | 0.674916 | $ 480.14 | 0.537334 | $ 431.00 | 0.601776 | $ - | 0.606056 | $ - |
| 442 | 0.0 | $ - | 0.0 | $ - | 0.0 | $ - | 0.0 | $ 216.81 | 0.0 | $ - |
| 448 | 0.536689 | $ 15.03 | 0.543322 | $ - | 0.557686 | $ - | 0.563467 | $ - | 0.558876 | $ - |
| 451 | 0.90283 | $ 174.16 | 0.723274 | $ 146.17 | 0.719958 | $ 145.50 | 0.726591 | $ 207.40 | 0.718378 | $ 39.58 |
| 453 | 0.0 | $ - | 0.0 | $ - | 0.0 | $ - | 0.0 | $ - | 0.0 | $ - |
| 454 | 0.90283 | $ 187.25 | 0.723274 | $ 19.31 | 0.719958 | $ 19.22 | 0.726591 | $ - | 0.718378 | $ - |
| 455 | 0.0 | $ - | 0.0 | $ - | 0.0 | $ - | 0.0 | $ - | 0.0 | $ - |
| 512 | 0.0 | $ - | 0.0 | $ - | 0.0 | $ - | 0.0 | $ - | 0.0 | $ - |
| 601 | 0.0 | $ - | 0.0 | $ - | 0.0 | $ - | 0.0 | $ - | 0.0 | $ - |
| 606 | 0.0 | $ - | 0.0 | $ - | 0.0 | $ - | 0.0 | $ - | 0.0 | $ - |
| 915 | 0.536689 | $ 283.80 | 0.543322 | $ 1.63 | 0.557686 | $ 1.67 | 0.563467 | $ - | 0.558876 | $ - |
| | | $ 2,697.88 | | $ 647.66 | | $ 659.89 | | $ 617.17 | | $ 39.58 |

*Source: Okanogan County, compiled by Resource Dimensions, 2014*

### 2.6.7 Cemetery Districts

44 study area parcels reside in one of three cemetery districts: #1, #2 or #4. Taxes assessed on these parcels by these cemetery districts declined from a total of $228.73 in 2009 to $0 in 2013 (Table 10). Study area parcels that do not reside in a cemetery district are not included in this calculation.

**Table 10. Cemetery Districts Levy Rates and Assessments summary (2009-2013)**

| 2009-2013 Cemetery Districts Levy Rates and Assessments | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | |
| TCA | Levy Rate | Tax Assessed | Levy Rate | Tax Assessed | Levy Rate | Tax Assessed | Levy Rate | Tax Assessed | Levy Rate | Tax Assessed |
| 312 | 0.022511 | $ 8.21 | 0.022795 | $ - | 0.0178430 | $ - | 0.020016 | $ - | 0.020212 | $ - |
| 313 | 0.0 | $ - | 0.0 | $ - | 0.0 | $ - | 0.0 | $ - | 0.0 | $ - |
| 314 | 0.022511 | $ 7.28 | 0.022795 | $ 0.01 | 0.0178430 | $ 2.08 | 0.020016 | $ 2.19 | 0.020212 | $ - |
| 341 | 0.055236 | $ 19.48 | 0.07 | $ 22.59 | 0.0575000 | $ 19.52 | 0.06293 | $ - | 0.063616 | $ - |
| 343 | 0.055236 | $ 144.59 | 0.07 | $ 49.80 | 0.0575000 | $ 46.12 | 0.06293 | $ - | 0.063616 | $ - |
| 442 | 0.0 | $ - | 0.0 | $ - | 0.0 | $ - | 0.0 | $ - | 0.0 | $ - |
| 448 | 0.0 | $ - | 0.0 | $ - | 0.0 | $ - | 0.0 | $ - | 0.0 | $ - |
| 451 | 0.0 | $ - | 0.0 | $ - | 0.0 | $ - | 0.0 | $ - | 0.0 | $ - |
| 453 | 0.0 | $ - | 0.0 | $ - | 0.0 | $ - | 0.0 | $ - | 0.0 | $ - |
| 454 | 0.0 | $ - | 0.0 | $ - | 0.0 | $ - | 0.0 | $ - | 0.0 | $ - |
| 455 | 0.0 | $ - | 0.0 | $ - | 0.0 | $ - | 0.0 | $ - | 0.0 | $ - |
| 512 | 0.0 | $ - | 0.0 | $ - | 0.0 | $ - | 0.0 | $ - | 0.0 | $ - |
| 601 | 0.0 | $ - | 0.117177 | $ - | 0.0 | $ - | 0.0 | $ - | 0.0 | $ - |
| 606 | 0.061079 | $ 49.17 | 0.0 | $ - | 0.0628870 | $ - | 0.069566 | $ - | 0.070035 | $ - |
| 915 | 0.0 | $ - | 0.0 | $ - | 0.0 | $ - | 0.0 | $ - | 0.0 | $ - |
| | | $ 228.73 | | $ 72.40 | | $ 67.71 | | $ 2.19 | | $ - |

*Source: Okanogan County, compiled by Resource Dimensions, 2014*

### 2.6.8 EMS Districts

Most study area parcels reside in one of three EMS districts: Methow Valley, Oroville-Rural or Tonasket. Taxes assessed on study area parcels by these EMS districts declined from a total of $2,419.97 in 2009 to $17.67 in 2013 (Table 11). The 34 study area parcels that do not reside in an EMS district are not included in this calculation.

**Table 11. EMS Districts Levy Rates and Assessments summary (2009-2013)**

| 2009-2013 EMS Districts Levy Rates and Assessments | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | | |
| TCA | Levy Rate | Tax Assessed | Levy Rate | Tax Assessed | Levy Rate | Tax Assessed | Levy Rate | Tax Assessed | Levy Rate | Tax Assessed | | |
| 312 | 0.375806 | $ 137.06 | 0.380451 | $ - | 0.303449 | $ - | 0.340222 | $ - | 0.343057 | $ - | | |
| 313 | 0.375806 | $ 40.62 | 0.380451 | $ - | 0.303449 | $ - | 0.340222 | $ - | 0.343057 | $ - | | |
| 314 | 0.375806 | $ 121.61 | 0.380451 | $ 0.23 | 0.303449 | $ 35.29 | 0.340222 | $ 37.22 | 0.343057 | $ - | | |
| 341 | 0.375806 | $ 132.51 | 0.380451 | $ 122.77 | 0.303449 | $ 102.99 | 0.340222 | $ - | 0.343057 | $ - | | |
| 343 | 0.375806 | $ 983.71 | 0.380451 | $ 270.65 | 0.303449 | $ 243.40 | 0.340222 | $ - | 0.343057 | $ - | | |
| 442 | 0.369413 | $ 160.77 | 0.31362 | $ 37.95 | 0.31496 | $ 26.46 | 0.317932 | $ 18.31 | 0.320764 | $ - | | |
| 448 | 0.369413 | $ 10.34 | 0.31362 | $ - | 0.31496 | $ - | 0.317932 | $ - | 0.320764 | $ - | | |
| 451 | 0.369413 | $ 71.26 | 0.31362 | $ 63.38 | 0.31496 | $ 63.65 | 0.317932 | $ 17.52 | 0.320764 | $ 17.67 | | |
| 453 | 0.369413 | $ 42.74 | 0.31362 | $ 36.29 | 0.31496 | $ 36.44 | 0.317932 | $ - | 0.320764 | $ - | | |
| 454 | 0.369413 | $ 76.62 | 0.31362 | $ 8.37 | 0.31496 | $ 8.41 | 0.317932 | $ - | 0.320764 | $ - | | |
| 455 | 0.369413 | $ 493.94 | 0.31362 | $ 27.88 | 0.31496 | $ 28.00 | 0.317932 | $ - | 0.320764 | $ - | | |
| 512 | 0.0 | $ - | 0.0 | $ - | 0.0 | $ - | 0.0 | $ - | 0.0 | $ - | | |
| 601 | 0.114938 | $ 56.25 | 0.117177 | $ - | 0.118795 | $ - | 0.128978 | $ - | 0.249999 | $ - | | |
| 606 | 0.114938 | $ 92.54 | 0.117177 | $ - | 0.118795 | $ - | 0.128978 | $ - | 0.249999 | $ - | | |
| 915 | 0.0 | $ - | 0.0 | $ - | 0.0 | $ - | 0.0 | $ - | 0.0 | $ - | | |
| | | $ 2,419.97 | | $ 567.52 | | $ 544.64 | | $ 73.05 | | $ 17.67 | | |

*Source: Okanogan County, compiled by Resource Dimensions, 2014*

Table 12 summarizes the results of Tables 4 to 11, the County tax assessments on the study area parcels from 2009 to 2013. As WDFW acquired the study area parcels, the County tax assessed declined from about $60,090 in 2009 to about $498 in 2013. The total County tax assessed on the study area parcels over 2009 to 2013 was $84,436.86.

**Table 12: Summary County Tax Assessed on Study Area Parcels (2009-2013)**

| District Type | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|
| County | $ 11,826.96 | $ 2,108.12 | $ 2,196.29 | $ 314.57 | $ 78.21 |
| Road | $ 12,980.10 | $ 2,314.48 | $ 2,384.85 | $ 276.63 | $ 68.77 |
| Library | $ 3,318.61 | $ 587.76 | $ 699.40 | $ 94.60 | $ 24.86 |
| School | $ 24,001.79 | $ 3,665.37 | $ 4,078.85 | $ 617.17 | $ 234.72 |
| Hospital | $ 2,615.94 | $ 567.54 | $ 570.35 | $ 120.53 | $ 34.33 |
| Fire | $ 2,697.88 | $ 647.66 | $ 659.89 | $ 617.17 | $ 39.58 |
| Cemetery | $ 228.73 | $ 72.40 | $ 67.71 | $ 2.19 | $ - |
| EMS | $ 2,419.97 | $ 567.52 | $ 544.64 | $ 73.05 | $ 17.67 |
| **Total** | $ 60,089.97 | $ 10,530.84 | $ 11,201.97 | $ 2,115.92 | $ 498.16 |

*Source: Resource Dimensions, 2014*

One note regarding Table 12, it is difficult to assess what the County tax assessment *would have been* on a study area parcel had it not been acquired by WDFW. This is because it is not known what the taxable value may have been had the parcel remained in private ownership (i.e. only the 'real' taxable value is known). Investigating this would require assuming the same taxable value for a parcel from its last year in private ownership. For example, for a parcel acquired by WDFW in 2009, evaluation of what the County tax assessment would have been for 2013, the calculation would be reliant on the 2009 taxable value. As the taxable value of real estate is variable from year to year, such an assessment would be present a series of problematic assumptions.

Table 13 summarizes the findings of Section 2, for County tax assessed, PILT assessed and PILT paid. This is a complete accounting of assessments for study area parcels from 2009 to 2013. Note the inverse relationship between County tax assessments and PILT assessments. As a study area parcel was acquired by WDFW County tax assessments ceased but PILT assessments began.

**Table 13: Summary of Tax Assessed, PILT Assessed and PILT Paid on Study Area Parcels (2009-2013)**

| Year | County Tax Assessed[1] | PILT Assessed[2] | PILT Paid[3] |
|---|---|---|---|
| 2009 | $ 60,089.97 | $ 1,530.56 | $ 1,530.56 |
| 2010 | $ 10,530.84 | $ 15,124.37 | $ 15,124.37 |
| 2011 | $ 11,201.97 | $ 21,308.16 | $ 21,308.16 |
| 2012 | $ 2,115.92 | $ 33,566.16 | $ 4,670.41 |
| 2013 | $ 498.16 | $ 46,241.49 | $ 5,714.73 |
| **Total** | $ 84,436.86 | $117,770.75 | $ 48,348.24 |

*Source: Resource Dimensions, 2014*

[1]/ Total of all County tax assessments for parcels acquired by WDFW from January 1, 2008 through June 30, 2013. Totals reflect taxes assessed while parcels were in private ownership.
[2]/ Total PILT assessed on WDFW-owned parcels, for parcels acquired from January 1, 2008 through June 30, 2013.
[3]/ Total PILT paid on WDFW-owned parcels, for parcels acquired from January 1, 2008 through June 30, 2013.

# SECTION 3: LAND CAPACITY AND CUSTOMIZED BUILD-OUT SCENARIO

## 3.1 INTRODUCTION

A customized build-out scenario for the study area parcels falling within the three subareas was developed through the integration of data layers within a GIS platform. Data layers used to model the build-out scenario include: County land use, zoning, roads, wells, existing buildings, environmental and land parcel data, U.S. Geological Survey slopes, U.S. Fish & Wildlife Service (USFWS) National Wetland Inventory (NWI) wetland buffers, and U.S. Department of Agriculture Natural Resource Conservation Service (USDA NRCS) soils data. Model flexibility for evaluation of various "what-if" scenarios is enhanced through the GIS extension module in CommunityViz®, which provides a lithe decision-support mode.[27]

### Estimating Capacity

The projected development capacity for study area parcels is based on a supply-side build-out analysis. The model calculates development capacity *"…using a clearly delineated area that is based on assumptions for density, physical constraints to development, and land-use regulations"*. Rather than forecast how many buildings will actually be built, a numeric build-out analysis represents the theoretical maximum projection for how many buildings could be built based on the holding capacity of the land.[28]

To determine the actual spatial build-out capacity of the study area parcels, numeric build-out analyses were refined using several criteria, including building type (e.g., residential, commercial and mixed use), building setbacks, minimum lot size (MLS), and other parameters defined within the County Code.

#### Zoning Density

The December 9, 2013 Okanogan County Parcel Coverage dataset provided records used to comprise the land use layer for the 156 study area parcels, which reside in four zones: Minimum Requirement District (MRD), Rural Residential (RR), School District 350 (SD 350) and Valley Floor (VF (MRD5)).[29]

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[27] CommunityViz® Scenario 360 is a GIS software extension that provides analytical tools to aid planners, governments and policy-makers in understanding the impacts of land use decisions. http://placeways.com/communityviz

[28] *Placeways, LLC. Working with the Build-Out Wizard. http://placeways.com/downloads/CV4-4/WorkingWithTheBuild-OutWizard4-4.pdf*

[29] *Okanogan County GIS, Available Digital Data, 'Parcel Coverage'. December 9, 2013 file. http://www.okanogancounty.org/planning/data.htm*

Each designated land use within the land use layer is assigned a density. Our analysis uses residential densities from the Okanogan County Code. Residential land use density is described in the County Code as MLS, the minimum area used by each dwelling unit. Table 14 provides densities for the four zones where study area parcels reside.[30]

**Table 14. Okanogan County Zoning for Study Area Parcels**

| Zone | Minimum Lot Size (area per dwelling unit) |
|---|---|
| Minimum Requirement District (MRD) | 1 acre |
| Rural Residential (RR) | 5 acres |
| School District 350 (SD 350) | 20 acres |
| Valley Floor (VF MRD5) | 5 acres |

*Sources:* Okanogan County Code, 17.05.070, 17.14.070(B), and 17.14A.070; Okanogan County GIS, County Zoning file, October 24, 2013.

### Development Type

Commercial and mixed use development were not considered for any of the study area parcels for several reasons, including remoteness, lack of access, traditional development for similar lands within the local area, distance to the rail belt, etc. Thus, all buildings that could be placed in the buildable area, as calculated by the numeric build-out analyses, are considered to be residential single family homes, or 'dwelling units'.

### Development Efficiency Factors

To adjust the density values for common density losses within the build-out analyses an efficiency factor was "*entered as a percentage where 100% means complete efficiency (no density lost) and 0% means no buildings will be estimated for that land use.*"[31]

Efficiency factors, as used in our analyses, are predicated on the likelihood that an area would be developed. For example, those study area parcels residing in the Mazama-Carlton subarea were considered to have a 100% likelihood *of potentially being developed*; thus, the efficiency factor for these parcels is 100%. Those study area parcels in the Nighthawk subarea were considered to have a 33% likelihood of being developed. Finally, the parcels in the Tonasket-Omak subarea were assigned efficiency factors of 100%, 50% or 30%, based on current development, development potential, access, etc.

[30] *Assessment conducted using Okanogan County GIS Program, October 24, 2013 County Zoning shapefile.*
[31] *Placeways, LLC. Working with the Build-Out Wizard.*

### Dwelling Assumptions

The numeric build-out analyses also incorporate information about buildings into the calculations of holding capacity. Our analyses assume one dwelling unit per building lot, using a five-year County average footprint for new residences, 2,490 square feet.[32] This figure was calculated by averaging the average square footage of new residences in the County from 2009 to 2013. For example, in 2012 Okanogan County issued 84 permits for new residences, having a total of 180,230 square feet, or, an average square footage per residence of 2,145.

### Constraints

Through specifying constraints to development, we removed those areas that cannot be built given relevant codes, regulations, and laws from the calculation of holding capacity. Two constraints to development are used in the numeric build-out analyses. The first layer is wetland buffers, set forth through the USFWS NWI. The second layer is steep sloped areas (i.e. slopes greater than 30 degrees). The Okanogan County GIS Division metadata provided required data layers. Mechanically, any portion of a study area parcel defined as residing on a wetland buffer or a steep slope is observed as undevelopable.

After all development constraints are applied, the actual buildable area of a legal building lot may become smaller than the MLS. To refine our estimates, we specified a MLS for buildable parcels, based on the County zoning regulations.[33] Thus, no buildings were placed on parcels, where the buildable area, after development constraints were applied, was smaller than the specified MLS.

### Numeric Build-Out

A numeric build-out analysis calculates the remaining capacity for an area, excluding existing buildings. Mechanically this is performed by calculating total theoretical capacity, then subtracting those buildings already built on the buildable area. As a proxy, our analysis employed a layer of wells, as included in the Okanogan County GIS metadata. We assume that one well corresponds to one existing building. No assumptions were made about floor space for these buildings.

The numeric build-out analysis converted the specified land use information into specific building counts and calculates gross and net buildable area.

### Spatial Build-Out

In the spatial build-out analyses, the results of the numeric build-out analyses were refined to account for the actual geometry of land-use areas and buildings. Three specifications are

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[32] *Okanogan County Building Department, Annual Reports, 2009-2013. http://www.okanogancounty.org/Building/REPORTS.htm*

[33] *Okanogan County Code, 17.05.070, 17.14.070(B) and 17.14A.070; Okanogan County GIS, County Zoning file, October 24, 2013. For example, parcels in the MRD have a MLS of 1 acre.*

included in a spatial build-out analysis: minimum building separation distances, the likely pattern of development, and road setback distances.

The minimum building separation distance is a buffer zone between contiguous new buildings on a parcel; however, a new building placed in a contiguous parcel may be closer than the minimum building separation distance. A minimum building separation distance of 100 feet was used for all land use types.[34]

A layout pattern for development allows control for the likely pattern of development, either random, grid or 'follow roads'. Given the rural and relatively remote nature of the study area parcels, and our analysis, the pattern of development assumed most likely is 'follow roads'. The roads layer was downloaded from the Okanogan County GIS Division website.[35]

Road setback distances used in our analysis are set by those in the County Code.[36] Table 15 provides road setbacks for each zone included in our analyses.

**Table 15. Road Setbacks by Land Use Zone**

| Zone | Front Setback (feet) |
|---|---|
| MRD | 25 |
| RR | 25 |
| SD 350 | 50 |
| VF (MRD5) | 25 |

*Sources: Okanogan County Code, 17.05.070, 17.14.070(B), and 17.14A.070; Okanogan County GIS, County Zoning file, October 24, 2013.*

## 3.2 RESULTS

The numbers of residential dwelling units by land-use zone are reported in Table 16. The numeric build-out analyses calculated a holding capacity of 2,926 total dwelling units. After minimum building separation distance, the likely pattern of development and road setbacks distances were specified, the spatial build-out analyses calculated a probability of a total of 166 dwelling units on the study area parcels. Across the study area parcels there are an estimated 31 existing buildings.

[34] *Placeways, LLC. Working with the Build-Out Wizard.*
[35] *Okanogan County GIS, Available Digital Data, 'GIS Road Coverage'. November 14, 2013 file. http://www.okanogancounty.org/planning/data.htm*
[36] *Okanogan County Code, 17.05.070, 17.14.070(B) and 17.14A.070; Okanogan County GIS, County Zoning file, October 24, 2013.*

**Table 16. Build-Out Analysis Summary**

| Land-Use Designation | Numeric Build-out | Spatial Build-out | Non-Buildable Difference | Existing Buildings |
|---|---|---|---|---|
| SD 350 | 25 | 10 | 15 | 16 |
| MRD | 2,883 | 155 | 2,728 | 9 |
| RR | - | - | - | 1 |
| VF (MRD5) | 18 | 1 | 17 | 5 |
| **Total** | 2,926 | 166 | 2,760 | 31 |

*Source: Resource Dimensions, 2014*

Buildable area by zoning designation, calculated in the numeric build-out analyses, is presented in Table 17. There is about 3.51 million square feet of gross buildable area on the study area parcels. However, the area constrained to development by wetlands and steep slopes reduces the gross buildable area to a net total of roughly 2.76 million square feet.

**Table 17. Buildable Area by Land Use Designation**

| Land-Use Designation | Gross Area (sq feet) | Net Buildable Area (sq feet) | Difference (sq feet) |
|---|---|---|---|
| SD 350 | 39,918,274.30 | 33,567,908.69 | 6,350,365.61 |
| MRD | 298,012,534.70 | 236,642,206.50 | 61,370,328.20 |
| RR | 1,471,575.27 | 244,683.02 | 1,226,892.24 |
| VF (MR D5) | 11,556,897.41 | 5,434,090.59 | 6,122,806.82 |
| **Total** | 350,959,281.67 | 275,888,888.80 | 75,070,392.87 |

*Source: Resource Dimensions, 2014*

## 3.3 STUDY AREA PARCELS MAPS

Study area parcels were mapped using ArcGIS 9, ArcMap 9.3.[37] All map layers were provided by the Okanogan County GIS metadata as previously described, with the exception of the Okanogan County base map, obtained through the Washington State Department of Natural Resources (DNR).[38]

Mazama-Carlton subarea study area parcels (Figure 2) were assigned an efficiency factor (i.e. likelihood of development) of 100%. Nighthawk subarea study area parcels (Figure 3) were assigned an efficiency factor of 33%. Tonasket-Omak subarea study area parcels (Figure 4) were assigned one of three efficiency factors, based on likelihood of development of each parcel cluster. Those in the Silver Hill and Tonasket areas were assigned an efficiency factor of 100%. Parcels in the large cluster

[37] *ESRI Corporation, Redlands, CA.*
[38] *Washington State DNR, Available GIS Data.*
*http://fortress.wa.gov/dnr/app1/dataweb/dmmatrix.html#Cadastre*

west of Highway 97, and the cluster of parcels in the Windy Hill Road area, were assigned an efficiency factor of 50%. The cluster of Study Area parcels south of South Janis Road, and the cluster of parcels northeast of the Silver Hill cluster, were assigned an efficiency factor of 30%.

**Figure 2. Mazama-Carlton subarea parcels**

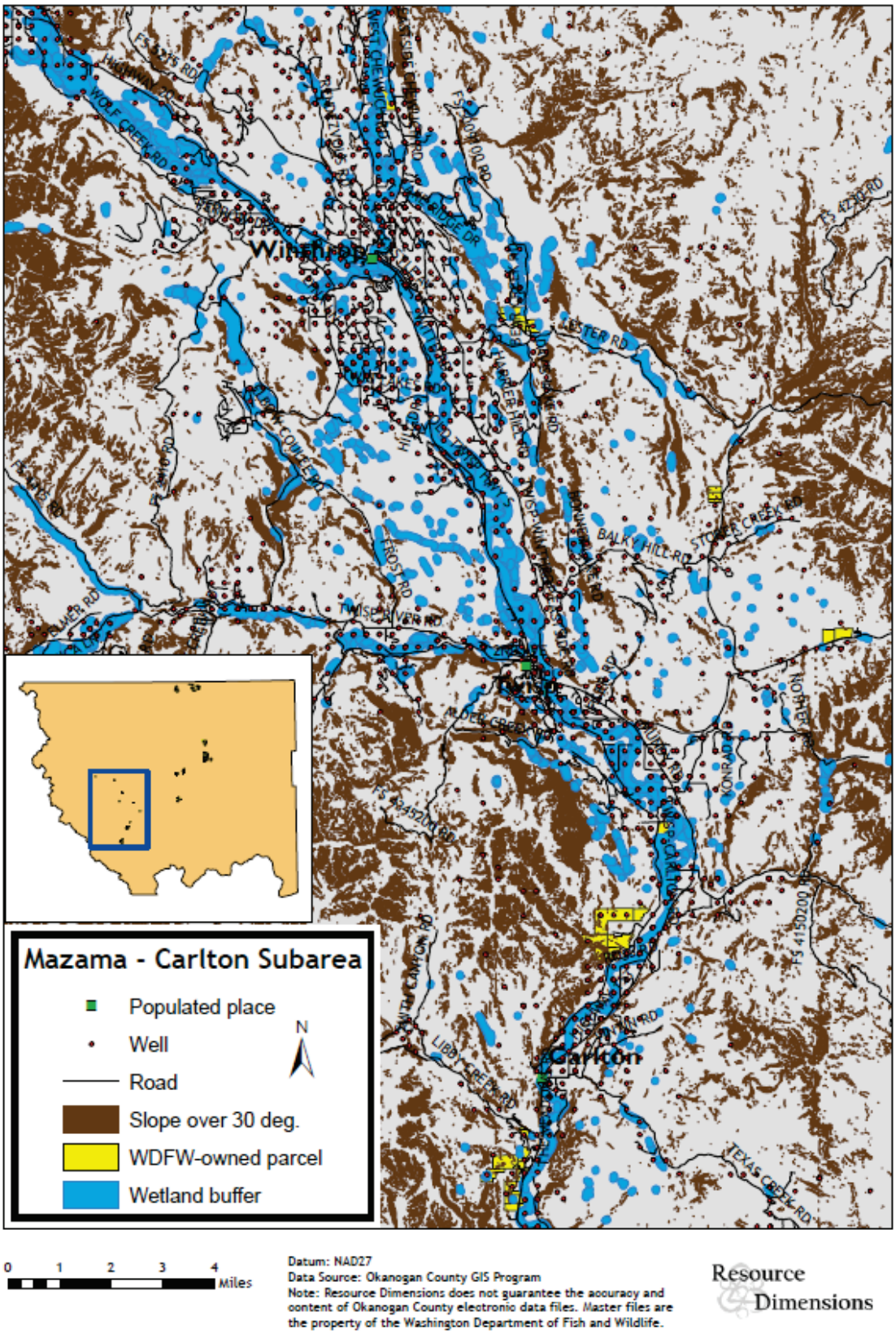


**Figure 3. Nighthawk subarea parcels**

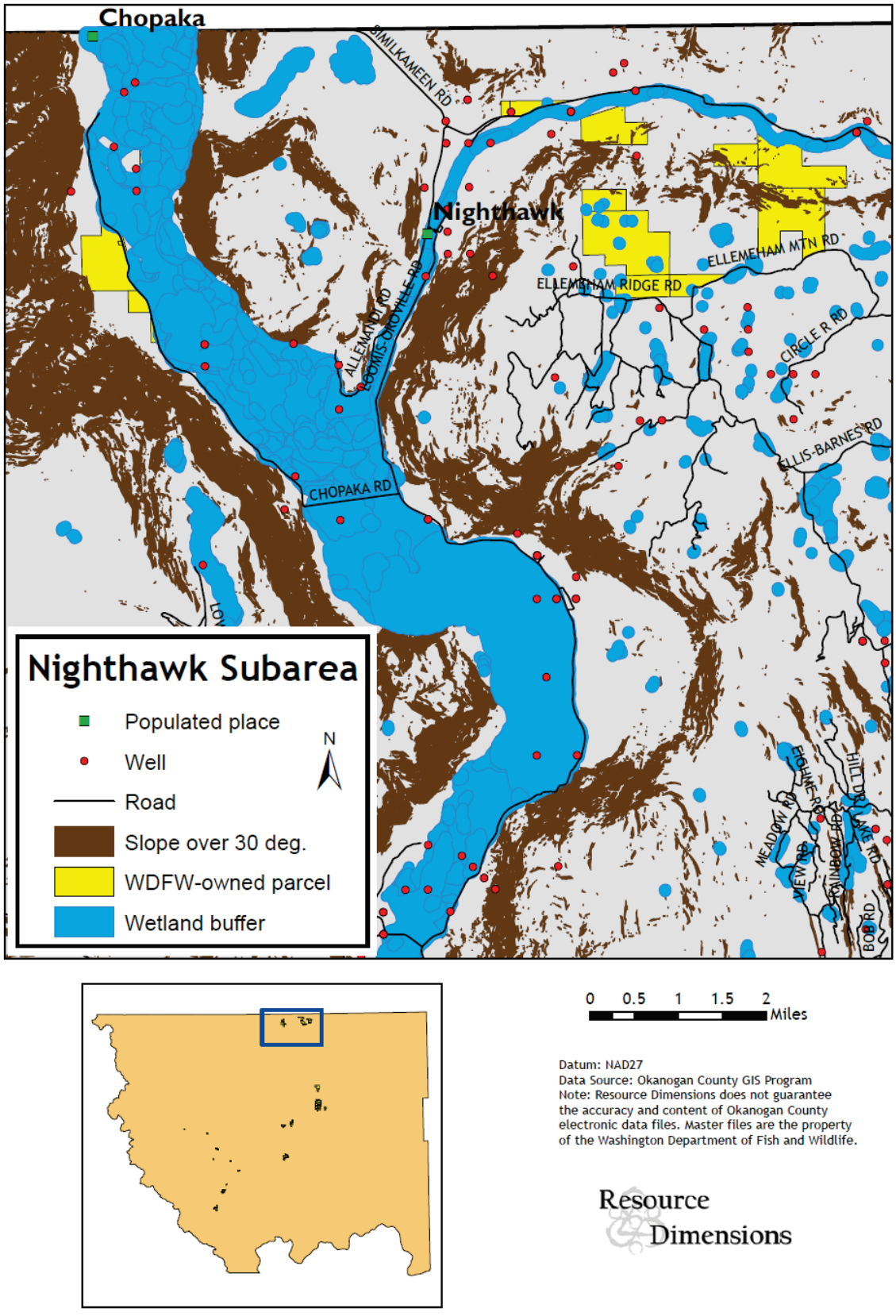
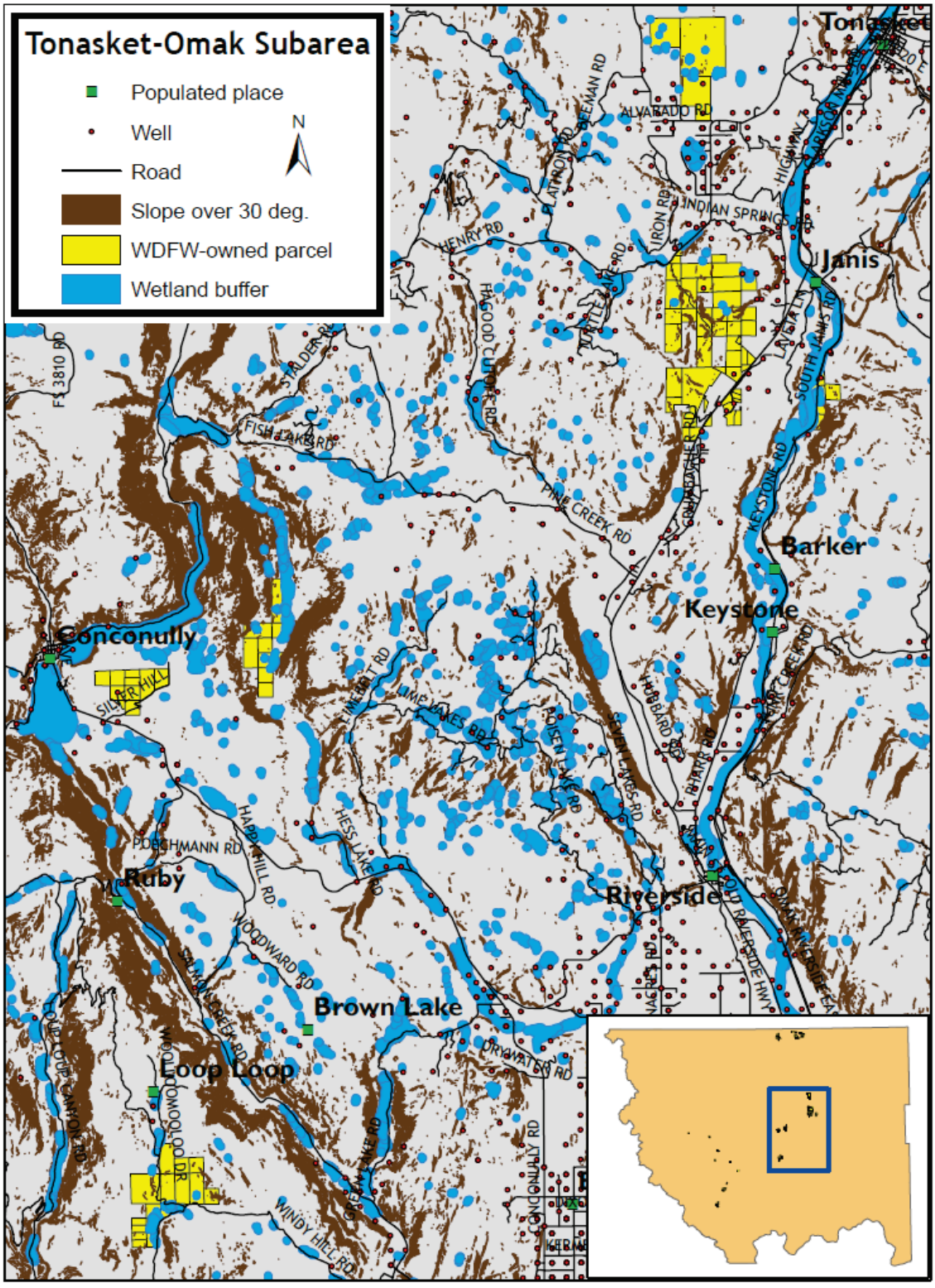


**Figure 4. Tonasket-Omak subarea parcels**



# SECTION 4: COMPARATIVE COSTS ASSESSMENT

## 4.1 OVERVIEW

This section presents the results of three analyses. Section 4.2 is a comparison of the cost of select services in the 2013 County Fiscal Year to a comparison of the cost to provide these same services in the case of the build-out scenario discussed in Section 3. In other words, **the cost to provide services in reality in 2013 is compared to the cost to provide services to the current population plus the new population that would result from the build-out scenario, in 2013.** This assumes that all 'new' dwelling units on study area parcels that could be built, **were built, by the end of 2013.**

Section 4.3 is a comparison of hypothetical tax assessed on new dwelling units built on the study area parcels, to PILT assessed and to PILT paid on the study area parcels.

Finally, Section 4.4 presents a comparison of hypothetical tax assessed on new dwelling units built on the study area parcels to the total cost to provide services to these new dwelling units.

## 4.2 EFFECT ON COST OF SERVICES BY NEW DWELLING UNITS

### 4.2.1 Taxing District Identification

166 'new' dwelling units can be placed on study area parcels. The TCA of each study area parcel is known (from previous tasks); as is each taxing district within the TCA where the parcel resides.[39]

Taxing districts that would provide services to 'new' dwelling units were identified by compiling all TCAs where study area parcels with 'new' dwelling units reside, and selecting for each individual taxing district where at least one 'new' dwelling unit would reside. The cost of services comparison is conducted for these taxing districts, which are presented in Table 18.

[39] *Okanogan County Assessor's Office, Okanogan County 2013 Levy Rates. http://www.okanogancounty.org/Assessor/levtax1-13.htm*

**Table 18. Taxing Districts Assessed**

| Taxing District | Taxing District |
|---|---|
| **Road District** | **EMS Districts** |
| **Law Enforcement**[1] | Methow Valley Rural |
| **Library District** | Oroville - Rural |
| **Fire Districts** | Tonasket EMS |
| Fire District #4 | **Hospital Districts** |
| Fire District #6 | Hospital District #1 |
| Fire District #9 | Hospital District #3 |
| **School Districts** | Hospital District #4 |
| Omak # 19 | **Cemetery Districts** |
| Okanogan #105 | Cemetery District #1 |
| Methow Valley #350 | Cemetery District #2 |
| Tonasket #404 | Cemetery District #4 |
| Oroville #410 | |

*Source: Resource Dimensions, 2014*

[1]/ Law Enforcement constitutes the Okanogan County Sheriff's Department plus the Okanogan County Jail.

### 4.2.2 Current Service Area Population

To determine the current cost to provide services on a per household basis (CPH), the current service area population of each taxing district in the analysis was estimated. This step is required as no reliable public estimate of current service population, for each taxing district in the analysis, exists. This multi-step process first requires determining how many residential parcels exist in each taxing district, then estimating the population of each residential parcel, and then finally summing the population of residential parcels to calculate the taxing district's service area population.

Washington Department of Revenue (DOR) Use Codes are provided for every parcel in the County, in the records of the land use layer already used.[40] DOR Use Codes 11 through 19 pertain to residential uses.[41] Parcels with these DOR Use Codes were selected as residential parcels; thus, the residential parcels residing in each TCA of the taxing districts in the analysis were identified to satisfy the first step. This was performed by sorting the records of land use layer by TCA and DOR Use Code.

[40] *Okanogan County GIS, Available Digital Data, 'Parcel Coverage'. December 9, 2013 file.* *http://www.okanogancounty.org/planning/data.htm*

[41] *Okanogan County Assessor's Office, DOR Use Codes.* *http://www.okanogancounty.org/Assessor/DOR%20Use%20Codes.htm*

The average household size in the County measured in the 2010 United States Census is 2.45 persons.[42] Thus, we assume that the population of each DOR Use Code 11, 'One Single Family Household', is 2.45 persons.

To estimate the population of each residential parcel in DOR Use Codes 12 through 19 (the second step), a weighting factor was applied based on the County average household size. For DOR Use Code 12, '2-4 Household Units', we use an average of three households, for a population of the parcel representing the parcel equaling 7.35 persons (3*2.45 persons). For DOR Use Code 13, '5 or More Household Units', we use a weighting factor of seven households, equating to a parcel population of 17.15 persons. For DOR Code 14, 'Residential Hotel or Condominium', DOR Code 15, 'Mobile Home Court or Park', and DOR Code 17, 'Institutional Lodging', we use a weighting factor of one, as we assumed that at least one household must reside on the parcel. For DOR Code 16, 'Motel/Hotel', we use a weighting factor of zero as it is very difficult to estimate even a ballpark number of equivalent residents. There were 54 DOR Code 16 parcels in the TCAs analyzed. For DOR Code 18, 'Structures on Leased Land', we use a weighting factor of zero (there was one DOR Code 18 parcel in the TCAs assessed). For DOR Code 19, 'Cabin', we assumed a weighting factor of 0.25, reflecting seasonal use. This equates to a parcel population of 0.6125 persons. Table 19 presents the weighting factor and population for each DOR Use Code.

**Table 19. Household Size by DOR Use Code**

| DOR Use Code | Residential Type | Weighting Factor | Assumed Household Size |
|---|---|---|---|
| 11 | One Single Family Household | 1 | 2.45 |
| 12 | 2-4 Household Units | 3 | 7.35 |
| 13 | 5 or More Household Units | 7 | 17.15 |
| 14 | Residential Hotel or Condominium | 1 | 2.45 |
| 15 | Mobile Home Court or Park | 1 | 2.45 |
| 16 | Motel/Hotel | 0 | 0 |
| 17 | Institutional Lodging | 1 | 2.45 |
| 18 | Structure on Leased Land | 0 | 0 |
| 19 | Cabin | 0.25 | 0.6125 |

*Source: Resource Dimensions, 2014*

The population for each DOR Use Code was assigned to each residential parcel within a taxing district (i.e. all Use Code 11s were assigned a population of 2.45). Parcel populations were then summed to calculate a total population for the taxing district (i.e. the 'current service area population' of the taxing district).

[42] *United States Census Bureau, American Fact Finder. Okanogan County, Washington. 2010 U.S. Census, Profile of General Population and Housing Characteristics: 2010. 2010 Demographic Profile Data. http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml*

This method was used to calculate the service area population for these taxing districts: Fire Districts #4, #6 and #9; Omak School District #19, Okanogan School District #105, Methow Valley School District #350, Tonasket School District #404, and Oroville School District #410; Cemetery Districts #1, #2 and #4; Methow Valley EMS District, Oroville-Rural EMS District and Tonasket EMS District; and Hospital Districts #3 and #4.

Four other districts within our analysis required additional research. The Road District was assumed to serve all residents of Okanogan County. Thus, the service area population is estimated to be 41,120, based on the 2010 U.S. Census.[43]

Some incorporated places have their own law enforcement; thus, are not served by the County. To calculate the County law enforcement service area population, the population of incorporated places served by their own law enforcement were summed and subtracted from the County population. An internet-based review was conducted to determine the current provider of law enforcement to 13 incorporated places. It was determined that the County provides law enforcement services to Conconully, Okanogan, Pateros and Riverside. The combined 2010 U.S. Census population for the nine remaining incorporated places served by their own law enforcement provider is 12,835; thus, the County law enforcement service area population is 28,285.

All communities in the County save the incorporated places of Omak, Conconully and Nespelem are served by the North Central Regional Library system (Library District). Subtracting the 2010 U.S. Census populations of these three areas from the total County population yields a service area population of 35,812 within Okanogan County. The library system also serves Chelan, Douglas, Ferry and Grant counties. However, not all communities within these four counties are served by the library system.

To determine service area population of the Library District, the 2010 U.S. Census populations of the four other counties were totaled. The communities not served by the library system are: Mansfield and Rock Island (in Douglas County), and Hartline, Krupp and Wilson Creek (in Grant County).[44] The 2010 U.S. Census populations of these five communities were totaled and subtracted from the total population of the four counties. This total was added to the service area population in Okanogan County, yielding a service area population for the North Central Regional Library system of 246,717.

Hospital District #1 serves the communities of Bridgeport and Mansfield in Douglas County, in addition to communities in Okanogan County. The service area population and service area households were identified for Bridgeport and Mansfield, and added to the service area population of Hospital District #1 in Okanogan County (which was calculated the same as the other taxing

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[43] *Ibid.*

[44] *Municipal Research and Services Center of Washington. Library Service Providers Listed by County. Updated 07/2013. http://www.mrsc.org/subjects/governance/spd/spd-libserv.aspx*

districts). Bridgeport had a population of 2,409 at the 2010 U.S. Census, and 673 households.[45] Mansfield had a population of 320 at the 2010 U.S. Census, and 144 households.[46] The total service area population of Hospital District #1 is 13,878.

### 4.2.3 Total Cost of Services, 2013

Total cost of services provided by each taxing district in our analysis was collected for the most recent Fiscal Year, 2013. For 11 of the 20 taxing districts in the analysis total cost to provide services are available in the County Budget.[47] To standard the measure of total cost to provide services, the figure allocated on the line item of 'Total (Name of District, etc.) Fund Uses' was used. For example, for the Road District, line item 'Total Road Fund Uses' (page 102), $16,226,435 was used as the value of total cost to provide services.

Figures on costs to provide services from other districts were found in other publicly available sources. Total cost to provide services for each of the taxing districts in this analysis, and sources, are provided in Table 20.

**Table 20. Total Cost to Provide Services, by Taxing District (2013)**

| Taxing District (Source) | Total Cost of Service | Taxing District (Source) | Total Cost of Service |
|---|---|---|---|
| **Road District** [1] | $ 16,226,435.00 | **EMS Districts** | |
| **Law Enforcement** [1] | $ 7,253,242.00 | Methow Valley Rural [1] | $ 454,773.00 |
| **Library District** [2] | $ 23,845,550.00 | Oroville - Rural [1] | $ 422,207.00 |
| **Fire Districts** | | Tonasket EMS [1] | $ 482,719.00 |
| Fire District #4 [1] | $ 536,000.00 | **Hospital Districts** | |
| Fire District #6 [1] | $ 1,590,080.00 | Hospital District #1 [8] | $ 12,500,000.00 |
| Fire District #9 [1] | $ 65,746.00 | Hospital District #3 [9] | $ 33,117,876.00 |
| **School Districts** | | Hospital District #4 [10] | $ 21,162,225.00 |
| Omak # 19 [3] | $ 33,558,514.00 | **Cemetery Districts** | |
| Okanogan #105 [4] | $ 10,991,276.00 | Cemetery District #1 [1] | $ 18,455.00 |
| Methow Valley #350 [5] | $ 6,678,652.00 | Cemetery District #2 [1] | $ 35,195.00 |
| Tonasket #404 [6] | $ 10,798,100.00 | Cemetery District #4 [1] | $ 58,861.00 |
| Oroville #410 [7] | $ 7,566,035.00 | | |

*Sources:*

1/ Okanogan County, Okanogan County 2013 Final Budget

[45] *United States Census Bureau, American Fact Finder. Bridgeport city, Washington. 2010 U.S. Census, Profile of General Population and Housing Characteristics: 2010. 2010 Demographic Profile Data. http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml*

[46] *United States Census Bureau, American Fact Finder. Mansfield town, Washington. 2010 U.S. Census, Profile of General Population and Housing Characteristics: 2010. 2010 Demographic Profile Data. http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml*

[47] *Okanogan County, Okanogan County 2013 Final Budget. http://okanogancounty.org/forms/13budget.pdf*

2/ Morris, A., Assistant Director,North Central Regional Library, telephonic communication, March 24, 2014.

3/ State of Washington, Office of Superintendent of Public Instruction (OSPI). Omak School District No. 019. P-195 Budget

4/ State of Washington, OSPI. Okanogan School District No. 105. P-195 Budget.

5/ State of Washington, OSPI. Methow Valley School District No. 350. P-195 Budget.

6/ State of Washington, OSPI. Tonasket School District No. 404. P-195 Budget.

7/ State of Washington, OSPI. Oroville School District No. 410. P-195 Budget.

8/ Total Operating Expenditures for FY 2014. Omak-Okanogan County Chronicle. Three Rivers projects budget surplus for 2014. November 26, 2013.

9/ Total Operating Expenditures for FY2012. Washington State Department of Health. 2012 Hospital Budgets. Mid Valley Hospital.

10/ Okanogan County Public Hospital District No. 4.Fiscal Year 2014 Budget, p. 10.

### 4.2.4 Cost per Household to Provide Services

The estimated service area population of each taxing district was divided by the County average household size (2.45 persons) to derive an estimated number of households in each taxing district. The total cost for each taxing district to provide services in 2013 was divided by the estimated number of households in that taxing district to derive an estimated service CPH in 2013 (Table 21).

**Table 21. Service Cost per Household, by Taxing District**

| Taxing District | Service Area Population | Service Area Households | Service Cost (2013) | Service CPH |
|---|---|---|---|---|
| **Road District** | 41,120 | 16,784 | $ 16,226,435 | $ 966.80 |
| **Law Enforcement** | 28,285 | 11,545 | $ 7,253,242 | $ 628.26 |
| **Library District** | 246,717 | 90,706 | $ 23,845,550 | $ 262.89 |
| **Fire Districts** | | | | |
| Fire District #4 | 1,484 | 606 | $ 536,000 | $ 884.91 |
| Fire District #6 | 5,657 | 2,309 | $ 1,590,080 | $ 688.65 |
| Fire District #9 | 115 | 47 | $ 65,746 | $ 1,400.68 |
| **EMS Districts** | | | | |
| Methow Valley Rural | 5,862 | 2,393 | $ 454,773 | $ 190.07 |
| Oroville - Rural | 2,322 | 948 | $ 422,207 | $ 445.48 |
| Tonasket EMS | 4,246 | 1,733 | $ 482,719 | $ 278.54 |
| **School Districts** | | | | |
| Omak # 19 | 7,368 | 3,007 | $ 33,558,514 | $ 11,158.84 |
| Okanogan #105 | 3,456 | 1,411 | $ 10,991,276 | $ 7,791.85 |
| Methow Valley #350 | 7,593 | 3,099 | $ 6,678,652 | $ 2,154.97 |
| Tonasket #404 | 4,265 | 1,741 | $ 10,798,100 | $ 6,202.89 |
| Oroville #410 | 4,362 | 1,780 | $ 7,566,035 | $ 4,249.61 |
| **Hospital Districts** | | | | |
| Hospital District #1 | 13,878 | 5,368 | $ 12,500,000 | $ 2,328.61 |
| Hospital District #3 | 10,822 | 4,417 | $ 33,117,876 | $ 7,497.58 |
| Hospital District #4 | 8,721 | 3,560 | $ 21,162,225 | $ 5,945.13 |
| **Cemetery Districts** | | | | |
| Cemetery District #1 | 4,198 | 1,713 | $ 18,455 | $ 10.77 |
| Cemetery District #2 | 3,044 | 1,242 | $ 35,195 | $ 28.33 |
| Cemetery District #4 | 3,834 | 1,565 | $ 58,861 | $ 37.61 |

*Source: Resource Dimensions, 2014*

### 4.2.5 Percent Increase in Taxing District Service Area Population

The new dwelling units added to the County tax base due to the build-out scenario are assumed to have a household size of 2.45 persons. Multiplying 2.45 persons by the number of new dwelling units per taxing district yielded a total new service area population for each taxing district in the analysis. The percent increase in the service area population of each taxing district in the analysis was calculated (Table 22).

The need for additional capital facilities by each taxing district is a major cost driver that may result from adding dwelling units. As there are no reliable estimates regarding specific expenses for new capital facilities, these cannot be added to the calculation of total cost to provide services to an

increased population.[48] However, taxing districts may be able to absorb dwelling units into their service area at varying service CPH. In other words, it may be easy for some taxing districts to serve the current population and the population of the new dwellings units with their current staff and infrastructure, whereas other taxing districts may have high expenses to accomplish this.

**Table 22. Calculated Increase in Service Area Population, by Taxing District**

| Taxing District | New DUs | New Service Area Population | Percent Increase in Service Area Population | New Capital Facilities Needed? |
|---|---|---|---|---|
| **Road District** | 166 | 406.7 | 0.98% | Likely |
| **Law Enforcement** | 166 | 406.7 | 1.42% | Likely |
| **Library District** | 166 | 406.7 | 0.16% | Not Likely |
| **Fire Districts** | | | | |
| Fire District #4 | 3 | 7.35 | 0.49% | Not Likely |
| Fire District #6 | 6 | 14.7 | 0.26% | Not Likely |
| Fire District #9 | 54 | 132.3 | 53.50% | Likely |
| **EMS Districts** | | | | |
| Methow Valley Rural | 11 | 26.95 | 0.46% | Not Likely |
| Oroville - Rural | 17 | 41.65 | 1.76% | Likely |
| Tonasket EMS | 26 | 63.7 | 1.48% | Likely |
| **School Districts** | | | | |
| Omak # 19 | 54 | 132.3 | 1.76% | Likely |
| Okanogan #105 | 58 | 142.1 | 3.95% | Likely |
| Methow Valley #350 | 11 | 26.95 | 0.35% | Not Likely |
| Tonasket #404 | 26 | 63.7 | 1.47% | Likely |
| Oroville #410 | 17 | 41.65 | 0.95% | Not Likely |
| **Hospital Districts** | | | | |
| Hospital District #1 | 11 | 26.95 | 0.19% | Not Likely |
| Hospital District #3 | 132 | 323.4 | 2.90% | Likely |
| Hospital District #4 | 23 | 56.35 | 0.64% | Not Likely |
| **Cemetery Districts** | | | | |
| Cemetery District #1 | 4 | 9.8 | 0.23% | Not Likely |
| Cemetery District #2 | 7 | 17.15 | 0.56% | Not Likely |
| Cemetery District #4 | 14 | 34.3 | 0.89% | Not Likely |

*Source: Resource Dimensions, 2014*

To provide a very high-level look at the taxing districts that may require new capital facilities and related infrastructure to serve the total service area population (i.e. current service area population

[48] *It would be assumed that the cost of new capital facilities would translate into an increased cost to provide services.*

plus the population from the new dwelling units), a 1% increase in service area population is used as a brightline. For taxing districts with less than a 1% increase, new capital facilities, etc. may not need to be added (implying that the service CPH to provide services may not be increased). For taxing districts with 1% or greater increase, it is possible that new capital facilities, etc. would be needed (implying that the service CPH to provide services may be increased). Eight of the 20 taxing districts analyzed are estimated to have a greater than 1% increase in service area population.

One exception to the brightline is the Road District – the estimated increase in service area population for the Road District is 0.98%. Some of the areas where new dwelling units could be built would most likely require new roads or upgrades to existing roads to adequately serve the new residential development. A portion of the county roads in the area of the study parcels are only seasonally maintained, and require significant upgrades to be brought up to transportation standards.[49]

### 4.2.6 Service Cost per Household Decrease Due to New Dwelling Units

To estimate the change in service CPH resulting from the addition of the new dwelling units to taxing districts, the number of total service area households in each taxing district was calculated. These totals are sums of the number of current households in each taxing district plus the number of new households in new dwelling units in the same taxing district. Service CPH (2013) was divided by the total service area households, by taxing district. On average, the total service CPH decreased 1.10%, not including Fire District #9 (Table 23).

In other words, when the number of households in the tax base increases, the cost to provide service to each household within the taxing district slightly decreases, **assuming no added costs** to provide the services. **Note that this calculation assumes no added service cost to any taxing district due to adding new dwelling units for new capital facilities or other infrastructure** (e.g., building a new fire station or purchasing a new fire truck)**. As previously mentioned no reliable estimates for such expenses exist, and thus cannot be included in these calculations.**

[49] *For example, upper Windy Hill Road washes out regularly in its current condition and becomes impassable for passenger cars. Source: Brown, J., WDFW Regional Director and area resident, electronic communication, March 25, 2014.*

**Table 23. Service Cost per Household Decrease Due to New Dwelling Units**

| Taxing District | Service Cost (2013) | Service CPH (2013) | Total Households (Current + New DUs) | Service CPH (Total Households) | Service CPH Decrease Due to New DUs |
|---|---|---|---|---|---|
| **Road District** | $ 16,226,435 | $ 967 | 16,950 | $ 957 | 0.98% |
| **Law Enforcement** | $ 7,253,242 | $ 628 | 11,711 | $ 619 | 1.42% |
| **Library District** | $ 23,845,550 | $ 263 | 90,872 | $ 262 | 0.18% |
| **Fire Districts** | | | | | |
| Fire District #4 | $ 536,000 | $ 885 | 609 | $ 881 | 0.49% |
| Fire District #6 | $ 1,590,080 | $ 689 | 2,315 | $ 687 | 0.26% |
| Fire District #9 | $ 65,746 | $ 1,401 | 101 | $ 651 | 53.50% |
| **EMS Districts** | | | | | |
| Methow Valley Rural | $ 454,773 | $ 190 | 2,404 | $ 189 | 0.46% |
| Oroville - Rural | $ 422,207 | $ 445 | 965 | $ 438 | 1.76% |
| Tonasket EMS | $ 482,719 | $ 279 | 1,759 | $ 274 | 1.48% |
| **School Districts** | | | | | |
| Omak # 19 | $ 33,558,514 | $ 11,159 | 3,061 | $ 10,962 | 1.76% |
| Okanogan #105 | $ 10,991,276 | $ 7,792 | 1,469 | $ 7,484 | 3.95% |
| Methow Valley #350 | $ 6,678,652 | $ 2,155 | 3,110 | $ 2,147 | 0.35% |
| Tonasket #404 | $ 10,798,100 | $ 6,203 | 1,767 | $ 6,112 | 1.47% |
| Oroville #410 | $ 7,566,035 | $ 4,250 | 1,797 | $ 4,209 | 0.95% |
| **Hospital Districts** | | | | | |
| Hospital District #1 | $ 12,500,000 | $ 2,329 | 5,379 | $ 2,324 | 0.20% |
| Hospital District #3 | $ 33,117,876 | $ 7,498 | 4,549 | $ 7,280 | 2.90% |
| Hospital District #4 | $ 21,162,225 | $ 5,945 | 3,583 | $ 5,907 | 0.64% |
| **Cemetery Districts** | | | | | |
| Cemetery District #1 | $ 18,455 | $ 11 | 1,717 | $ 11 | 0.23% |
| Cemetery District #2 | $ 35,195 | $ 28 | 1,249 | $ 28 | 0.56% |
| Cemetery District #4 | $ 58,861 | $ 38 | 1,579 | $ 37 | 0.89% |

*Source: Resource Dimensions, 2014*

## 4.3 HYPOTHETICAL TAX ASSESSED VERSUS PILT ASSESSED AND PILT PAID

One method of assessing potential return from study area parcels is to investigate the ratio of PILT assessed and PILT paid on the study area parcels versus the hypothetical tax that can be assessed on residential homes (i.e. the new dwelling units) that could be built as a result of the build-out scenario.

To calculate the hypothetical total taxable value of the new parcels, where the 166 new dwelling units would reside, the 2013 median taxable value for each TCA that new dwelling units would reside in was derived. This approach assumes that the taxable value of each new parcel where a new dwelling unit would reside equals the median taxable value of the TCA where it resides.

We assumed that in the case of single family households, market assessed value is equivalent to taxable value, as defined by the Okanogan County Assessor's Office. The market assessed value for each parcel in Okanogan County is available in the records of the previously used land use layer.[50] Within each TCA, all parcels with DOR Use Code 11 were sorted, and the TCA's median taxable value was calculated. Total taxable value for each TCA was computed by multiplying the number of new dwelling units within that TCA by its 2013 median taxable value. Total taxable value by TCA is shown in Table 24. The estimated total taxable value of the hypothetical new dwelling units in 2013 dollars is about $22.4 million.

**Table 24. Total Taxable Value by TCA**

| TCA | Dwelling Units | 2013 Median Taxable Value | Total Taxable Value |
|---|---|---|---|
| 314 | 4 | $ 291,250 | $ 1,165,000 |
| 341 | 5 | $ 215,600 | $ 1,078,000 |
| 343 | 2 | $ 223,250 | $ 446,500 |
| 442 | 20 | $ 74,000 | $ 1,480,000 |
| 454 | 3 | $ 105,900 | $ 317,700 |
| 455 | 3 | $ 125,300 | $ 375,900 |
| 512 | 58 | $ 126,100 | $ 7,313,800 |
| 601 | 3 | $ 101,600 | $ 304,800 |
| 606 | 14 | $ 186,600 | $ 2,612,400 |
| 915 | 54 | $ 135,100 | $ 7,295,400 |
| **Total** | 166 | | $ 22,389,500 |

*Source: Resource Dimensions, 2014*

[50] *Okanogan County GIS, Available Digital Data, 'Parcel Coverage'. December 9, 2013 file. http://www.okanogancounty.org/planning/data.htm*

To determine the total hypothetical tax assessed resulting from the new dwelling units, the total taxable value of the parcels where the new dwelling units would reside was multiplied by the 2013 levy rates of the taxing districts within the TCA where they would reside. Hypothetical taxes assessed by district (i.e. County, Road, Library) and type of district (school district, hospital district, fire district, cemetery district and EMS district) are presented in Table 25. The total hypothetical tax assessed on the new dwelling units in 2013 is $194,276.04.

**Table 25. Hypothetical Taxes Assessed by District Type on New Dwelling Units**

| TCA | County District | Road District | Library District | School District[1] | Hospital District[1] | Fire District | Cemetery District | EMS District |
|---|---|---|---|---|---|---|---|---|
| 314 | $ 1,653.71 | $ 1,454.08 | $ 525.60 | $ 2,479.98 | $ 695.19 | $ 706.06 | $ 23.55 | $ 399.66 |
| 341 | $ 1,530.22 | $ 1,345.49 | $ 486.35 | $ 2,294.78 | $ 643.27 | $ - | $ 68.58 | $ 369.82 |
| 343 | $ 633.80 | $ 557.29 | $ 201.44 | $ 950.48 | $ 266.44 | $ 270.60 | $ 28.40 | $ 153.17 |
| 442 | $ 2,100.85 | $ 1,847.24 | $ 667.71 | $ 6,304.77 | $ 1,569.35 | $ - | $ - | $ 474.73 |
| 454 | $ 450.97 | $ 396.53 | $ 143.33 | $ 1,353.39 | $ 336.88 | $ 228.23 | $ - | $ 101.91 |
| 455 | $ 533.59 | $ 469.18 | $ 169.59 | $ 1,601.33 | $ 398.59 | $ - | $ - | $ 120.58 |
| 512 | $ 10,381.91 | $ 9,128.63 | $ 3,299.66 | $ 42,890.32 | $ 4,557.38 | $ - | $ - | $ - |
| 601 | $ 432.66 | $ 380.43 | $ 137.51 | $ 889.78 | $ 323.20 | $ - | $ - | $ 76.20 |
| 606 | $ 3,708.29 | $ 3,260.64 | $ 1,178.60 | $ 7,626.23 | $ 2,770.12 | $ - | $ 182.96 | $ 653.10 |
| 915 | $ 10,355.79 | $ 9,105.67 | $ 3,291.36 | $ 34,015.75 | $ 4,545.91 | $ 4,077.22 | $ - | $ - |
| **Subtotal** | $ 31,781.81 | $27,945.19 | $10,101.16 | $100,406.80 | $16,106.32 | $ 5,282.11 | $ 303.49 | $ 2,349.16 |
| **Total** | $194,276.04 | | | | | | | |

*Source: Resource Dimensions, 2014*

The total hypothetical tax assessed assumes **all 166 new dwelling units were built-out by 2013**. The PILT assessed on all eligible study area parcels in 2013 was $46,241.49. Thus, the 2013 amount of PILT assessed is 23.8% of the hypothetical taxes that would have been assessed for the same year, under this assumption. The PILT paid on Study Area parcels in 2013 was $5,714.73; thus, 2.9% of the hypothetical taxes that would have been assessed, if all parcels were built-out by 2013 (Table 26).

**Table 26. Comparison of Hypothetical Tax Assessed to PILT Assessed and PILT Paid**

| Total Hypothetical Tax Assessed on 'New' DUs in 2013 | PILT Assessed on Study Area parcels in 2013 | PILT Paid on Study Area parcels in 2013 | PILT Assessed / Hypothetical Tax Assessed | PILT Paid / Hypothetical Tax Assessed |
|---|---|---|---|---|
| $ 194,276.04 | $ 46,241.49 | $ 5,714.73 | 23.80% | 2.94% |

*Source: Resource Dimensions, 2014*

## 4.4 HYPOTHETICAL TAX ASSESSED VS COSTS OF SERVICE FOR NEW DWELLING UNITS

In reality, there would be costs associated with serving new dwelling units. To understand this relationship, we calculated the increase in total service cost to provide services required to serve the new population.

The number of new dwelling units in each taxing district was multiplied by the service CPH for each taxing district in Table 23 to derive a total service cost for the new dwelling units in that taxing district. This value was added to the 2013 service cost for the taxing district (Table 20), to calculate an adjusted service cost (2013) reflecting the new dwelling units being added to each taxing district.

To illustrate, for the Road District this calculation is 16,784 service area households plus 166 new dwelling units = 16,950 total service area households. Each new dwelling unit has a service CPH of $957.33 (totaling $158,916.78). Thus, the adjusted service cost (2013) is $16,385,352 ($16,226,435 plus $158,917).

The adjusted service cost was divided by the current service cost (Table 20) to calculate the percent increase in total service cost (2013) due to the new dwelling units, by taxing district.

The cost to provide services to the new dwelling units totals $2,767,140 (Table 27). On average, the service cost (2013) for all taxing districts increased 1.08%, not including Fire District #9.

The hypothetical tax assessed on the new dwelling units is $194,276. Thus, the hypothetical tax assessed is about 7% of the cost to provide services to the new dwelling units ($194,276 divided by $2,767,140 x 100%). Note that taxing districts receive funding from a myriad of sources (i.e. user fees, federal and state monies, etc.), in addition to property taxes and levies; thus the cost to provide services is not a direct ratio to property taxes and levies.

**Table 27: Total Service Cost Increase Due to New Dwelling Units**

| Taxing District | New DUs | Service CPH (Total Service Area Households) | Total Service Cost for New DUs | Adjusted Service Cost with New DUs | Service CPH Increase Due to New DUs |
|---|---|---|---|---|---|
| **Road District** | 166 | $ 957 | $ 158,917 | $ 16,385,352 | 0.97% |
| **Law Enforcement** | 166 | $ 619 | $ 102,813 | $ 7,356,055 | 1.40% |
| **Library District** | 166 | $ 262 | $ 43,560 | $ 23,889,110 | 0.18% |
| **Fire Districts** | | | | | |
| Fire District #4 | 3 | $ 881 | $ 2,642 | $ 538,642 | 0.49% |
| Fire District #6 | 6 | $ 687 | $ 4,121 | $ 1,594,201 | 0.26% |
| Fire District #9 | 54 | $ 651 | $ 35,173 | $ 100,919 | 34.85% |
| **EMS Districts** | | | | | |
| Methow Valley Rural | 11 | $ 189 | $ 2,081 | $ 456,854 | 0.46% |
| Oroville - Rural | 17 | $ 438 | $ 7,440 | $ 429,647 | 1.73% |
| Tonasket EMS | 26 | $ 274 | $ 7,135 | $ 489,854 | 1.46% |
| **School Districts** | | | | | |
| Omak # 19 | 54 | $ 10,962 | $ 591,949 | $ 34,150,463 | 1.73% |
| Okanogan #105 | 58 | $ 7,484 | $ 434,079 | $ 11,425,355 | 3.80% |
| Methow Valley #350 | 11 | $ 2,147 | $ 23,621 | $ 6,702,273 | 0.35% |
| Tonasket #404 | 26 | $ 6,112 | $ 158,902 | $ 10,957,002 | 1.45% |
| Oroville #410 | 17 | $ 4,209 | $ 71,560 | $ 7,637,595 | 0.94% |
| **Hospital Districts** | | | | | |
| Hospital District #1 | 11 | $ 2,324 | $ 25,562 | $ 12,525,562 | 0.20% |
| Hospital District #3 | 132 | $ 7,280 | $ 960,963 | $ 34,078,840 | 2.82% |
| Hospital District #4 | 23 | $ 5,907 | $ 135,860 | $ 21,298,085 | 0.64% |
| **Cemetery Districts** | | | | | |
| Cemetery District #1 | 4 | $ 11 | $ 43 | $ 18,498 | 0.23% |
| Cemetery District #2 | 7 | $ 28 | $ 197 | $ 35,392 | 0.56% |
| Cemetery District #4 | 14 | $ 37 | $ 522 | $ 59,383 | 0.88% |
| **Total** | | | $ 2,767,140 | | |

*Source: Resource Dimensions, 2014*

The ratio of hypothetical tax assessed versus the cost to provide services to the new dwelling units should be weighed against the ratio of PILT assessed versus hypothetical tax assessed. PILT assessments imply no population growth on or residential use of the study area parcels, and hence little or no costs for service. Viewed in this light, PILT assessments offer purely benefit to the County. However, residential development of the study area parcels, as in the build-out scenario, will likely require costs beyond those calculated here, for new capital facilities and other infrastructure, staff and operations, etc.

# SECTION 5: ASSESSMENT OF WATER RIGHTS RETENTION

## 5.1 BACKGROUND

Washington State Department of Ecology (DOE) maintains a web-based map application, "Water Resources Explorer", containing information on more than 230,000 active water right and claim records in the state. Water Resources Explorer includes records dating back to the late 1800s.[51] As of March 2013 mapping of water rights in the Methow and Okanogan Water Resource Inventory Areas (WRIAs) is complete.[52] All 156 study area parcels reside in one of these WRIAs.

Water rights records contained in Water Resources Explorer catalogue many different types of information, including certificate number; name on the certificate; priority date; record type; record status; any low flow provision; up to three quantities (including the number of irrigated acres); up to three purposes (i.e. domestic use, irrigation, stock water, etc.); and source name.

To identify if water right records existed and what information it contained, all study area parcel PINs were searched using Water Resources Explorer.

46 total records were found on 31 study area parcels. By type, 12 are water rights certificates – seven were issued as a result of an application submitted to the State, and five resulted from judicial adjudication. Four of these records are Certificates of Change. Claims comprise 29 of the records, and there is one new application record.

Three questions relating to water rights were analyzed: (1) the potential for residential development on the study area parcels with water right records; (2) the potential agricultural use of each parcel with a water right; and (3) the potential gross value of tree fruit production on irrigated acres of parcels with water rights. All three questions are predicated on the assumption that the study area parcels were never purchased by WDFW, but instead remained as privately-owned property.

The 31 study area parcels with water right records were mapped using ArcGIS 9, ArcMap 9.3.[53] The Okanogan County GIS Division provided Land use and hydrography layers, and the Okanogan County base map was obtained through DNR.[54] Mazama-Carlton, Nighthawk and Tonasket-Omak subarea parcels subarea parcels having a water right record are respectively displayed in Figures 5, 6 and 7.

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[51] *DOE, Water Resources Explorer. http://www.ecy.wa.gov/programs/wr/info/webmap.html*
[52] *DOE, Mapping Water Rights in Washington State. http://www.ecy.wa.gov/programs/wr/info/images/pdf/WRIAMappingCount.pdf*
[53] *ESRI Corporation, Redlands, CA.*
[54] *Washington State DNR, Available GIS Data. http://fortress.wa.gov/dnr/app1/dataweb/dmmatrix.html#Cadastre*

**Figure 5. Mazama-Carlton subarea parcels with water rights**

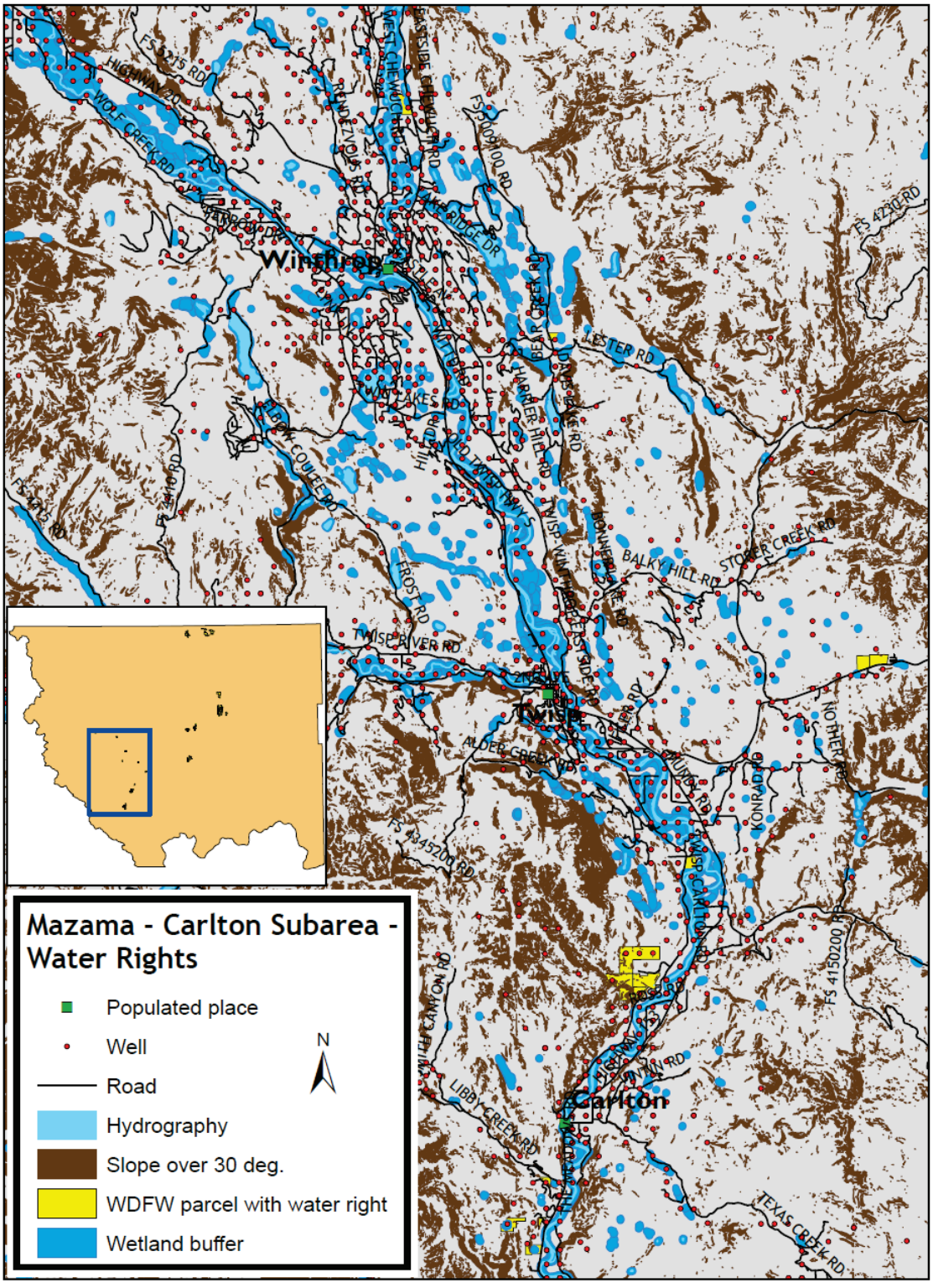
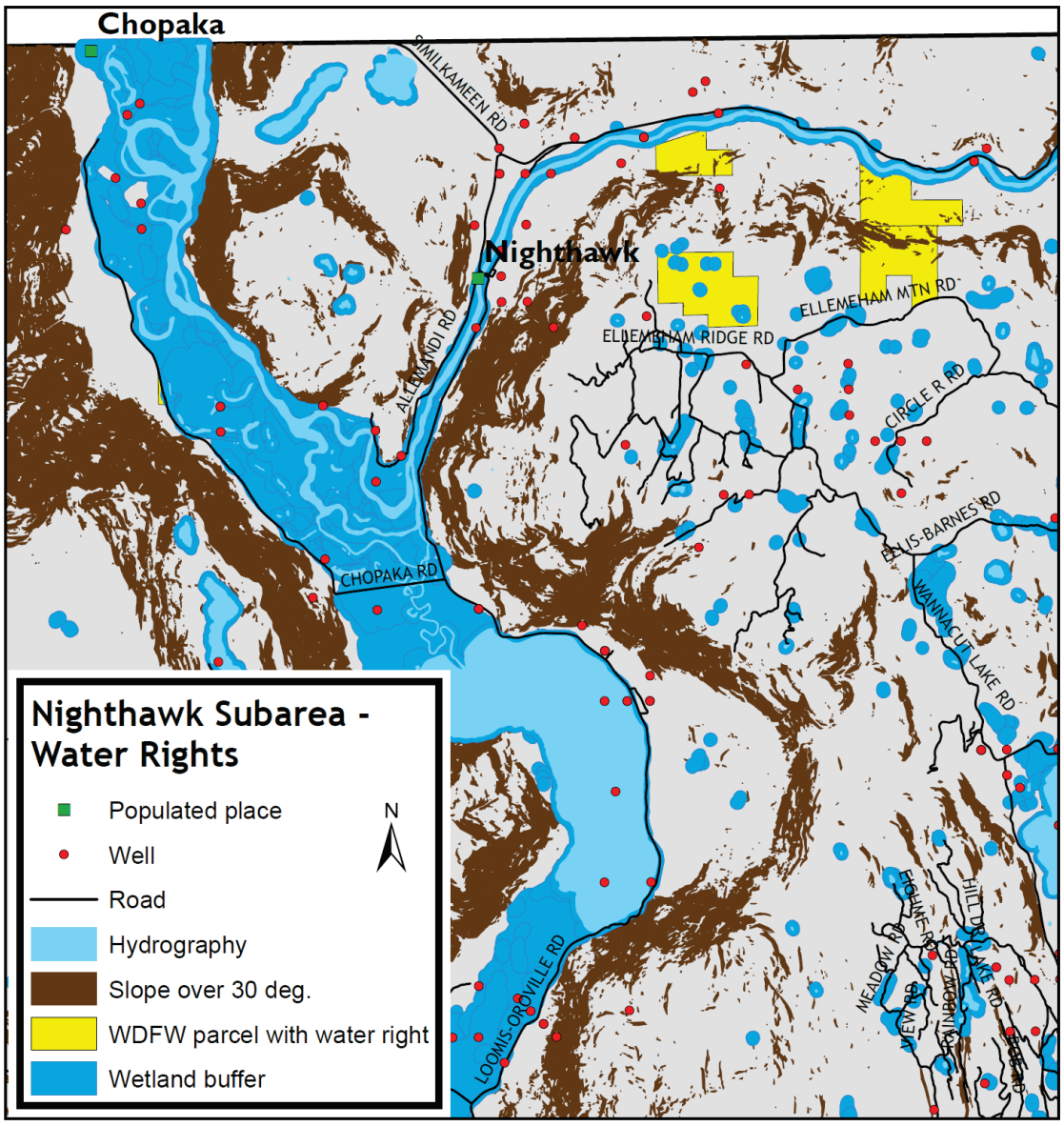


**Figure 6. Nighthawk subarea parcels with water rights**

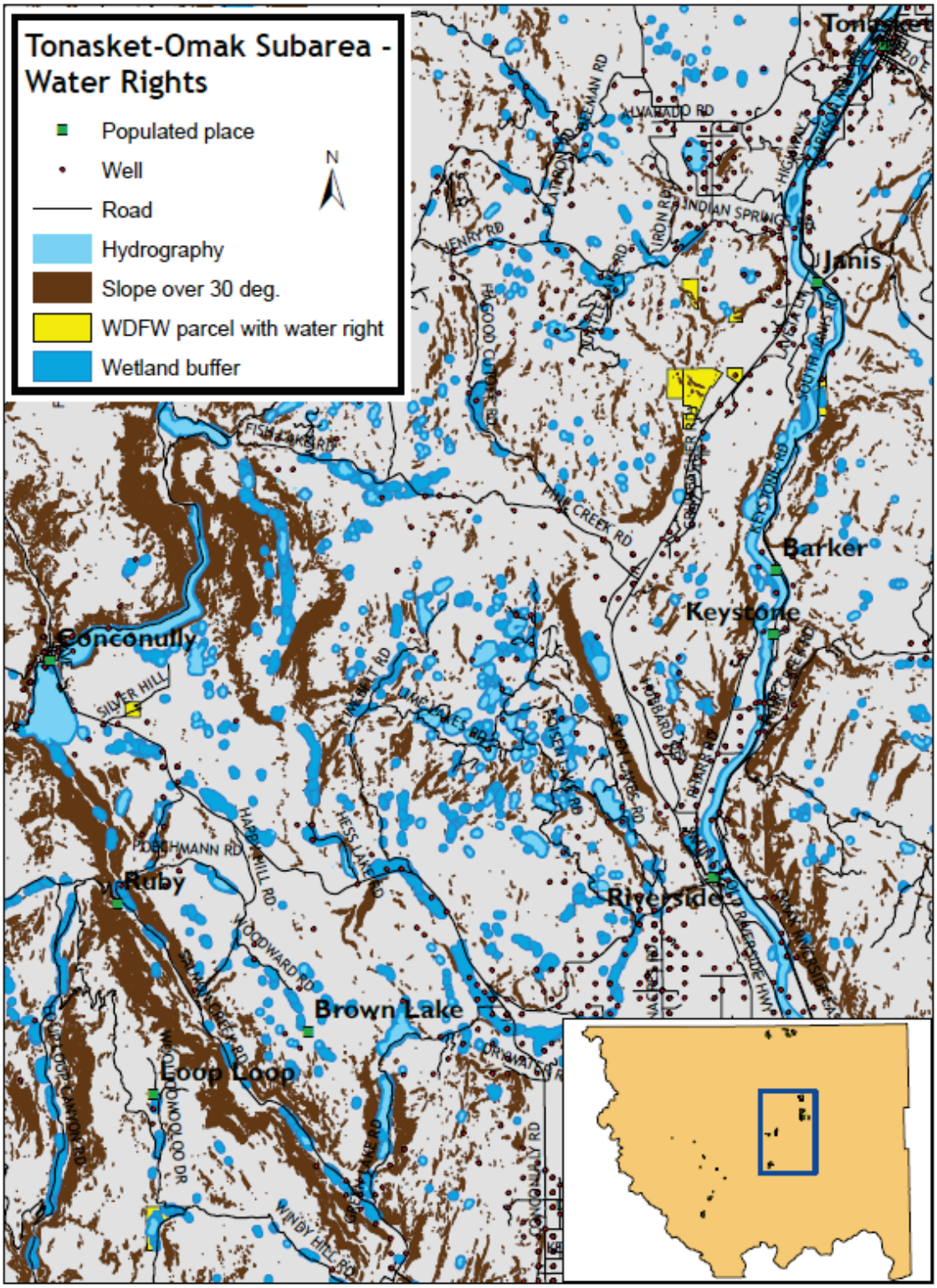



0 0.6 1.2 1.8 2.4 Miles

Datum: NAD27
Data Source: Okanogan County GIS Program
Note: Resource Dimensions does not guarantee the accuracy and content of Okanogan County electronic data files. Master files are the property of the Washington Department of Fish and Wildlife.

Resource Dimensions

**Figure 7. Tonasket-Omak subarea parcels with water rights**



## 5.2 HOLDING CAPACITY OF PARCELS WITH WATER RIGHT RECORDS

The build-out scenario described in Section 3 was repeated to calculate the number of dwelling units that may be placed on the 31 parcels with water right records. The one parcel residing in the RR zone does not have an associated water right record.

The numbers of residential dwelling units, by land-use designation, are reported in Table 28. The numeric build-out analysis calculated a holding capacity of 800 total dwelling units. After minimum building separation distance, the likely pattern of development and road setback distances were specified, the spatial build-out analysis determined a holding capacity of 57 dwelling units total on the 31 study area parcels with water right records. There were 14 existing buildings on the study area parcels, thus additional buildings for these lands are not considered within the numeric build-out analysis.

**Table 28. Build-out Analysis Summary, Study Area Parcels with Water Rights**

| Land-Use Designation | Numeric Build-Out | Spatial Build-Out | Non-Buildable Difference | Existing Buildings |
|---|---|---|---|---|
| SD 350 | 12 | 3 | 9 | 10 |
| MRD | 776 | 53 | 723 | 2 |
| VF (MR D5) | 12 | 1 | 11 | 2 |
| **Total** | 800 | 57 | 743 | 14 |

*Source: Resource Dimensions, 2014*

The total buildable area by land-use designation, calculated by the numeric build-out analysis, is shown in Table 29. The 31 study area parcels with water right records have a gross buildable area of roughly 1.14 million square feet. However, the area constrained to development by wetlands and steep slopes reduces the potential buildable area to a net total of roughly 0.83 million square feet.

**Table 29. Buildable Area Summary, Study Area Parcels with Water Rights**

| Land-Use Designation | Gross Area (sq feet) | Net Buildable Area (sq feet) | Difference (sq feet) |
|---|---|---|---|
| SD 350 | 23,836,156 | 20,540,224 | 3,295,933 |
| MRD | 83,722,425 | 59,432,025 | 24,290,401 |
| VF (MR D5) | 6,905,660 | 3,303,853 | 3,601,806 |
| **Total** | 114,464,241 | 83,276,102 | 31,188,140 |

*Source: Resource Dimensions, 2014*

## 5.3 POTENTIAL AGRICULTURAL USE OF PARCELS WITH WATER RIGHT RECORDS

The potential agricultural use of each parcel with a water right record was evaluated through a two-step process. First, each parcel was visually assessed for items including topography, elevation, land cover and current agricultural use. Second, water right information obtained from the Water Resources Explorer database was examined to determine if it reflects visual conditions.

To facilitate visual inspection, each parcel was searched using the Google Earth[55] map of Okanogan County. Google Earth is a web-based application that maps the planet using satellite imagery, aerial photography and GIS. Zooming into the map allows the user to assess topographic relief and land cover. The imagery date for the geographies where the 31 study area parcels with water right records reside was either July or August 2013.

The subarea maps (Figures 5, 6 and 7) made it possible to align each study area parcel on the Google Earth map. Alignment was ensured through the roads and hydrography layers downloaded from and provided by the Okanogan County GIS Division and comparing them to the roads and hydrography projected by Google Earth. A careful comparison yielded the topography, elevation and recent land cover of each parcel. This method allowed us to interpret the most likely agriculture use for each parcel – rangeland, or irrigated agriculture, including grass farming or tree fruit.

It is important to note that water rights can be separated from the land, and do not just have to be used in place. For example, water rights could be used on more agriculturally productive land. Further, the timing and quantity of the right may also affect other use possibilities. Our analysis is **solely confined** to considering agricultural use of the study area parcels with water rights records.

To make the assessments, **most real-world aspects of agricultural production are not considered**, such as topography, land cover, soil, regional variability, fruit variety, elevation and slope, frost zone issues, and agricultural economics. Thus, this is **solely a high-level view of potential agricultural use** of the study area parcels with water rights records.

The second step in verifying agricultural potential was to compare the visual assessment of each parcel to the information contained in its water right record. By comparing the purpose contained in water right record to the visual assessment of each parcel for alignment, it is possible to estimate the potential current agricultural use of each parcel with a water right record. Examples of purposes include irrigation, stock water, domestic use, and power generation.

Potentially 13 of the 31 parcels could be used as rangeland only. Six parcels have potential agricultural use for either grass (hay) farming or as rangeland. Five parcels have potential for grass farming. Three parcels have potential use for tree fruit farming, and one parcel has potential for either tree fruit farming or grass farming. Water right records for three parcels indicate there is no potential for their agricultural use (i.e. the purpose is for only domestic general use only or power).

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[55] *Google Earth is available for download at www.google.com/earth.*

## 5.4 WATER RIGHTS: GROSS VALUE OF CROPS

The 2007 USDA Census of Agriculture reported acreage per crop for Okanogan County. Among the five crops with the greatest acreages are apples, pears and sweet cherries (the other two were forage crops and wheat for grain).[56]

The water rights records on the 31 study area parcels reflect 1,117.2 irrigated acres total. To calculate the potential gross value of farming these irrigated acres for each of the three leading tree fruits in Okanogan County, average historic yields were multiplied by average historic prices.

Yield and price information for each crop from 2003 through 2012 was provided by USDA National Agricultural Statistics Service (NASS) annual reports, the Noncitrus Fruits and Nuts summaries.[57] Summary reports from July 2006 to January 2013 (preliminary summary for 2012) provided yield and price data by year, for the three preceding. Because annual yield and price estimates could be adjusted in subsequent years, the last year for which data was reported was utilized in the calculation. For example, 2006 data was last reported in the summary report published in 2009; thus, the yield and price data we used for 2006 was that reported in the 2009 summary. County-level yield and price estimates are not reported by USDA NASS; thus yield and price estimates are based on the Washington average, as reported by monthly grower surveys.[58]

To derive the following calculations, **most real-world aspects of tree fruit farming are not considered**, such as topography, land cover, soil, regional variability, fruit variety, elevation and slope, and the economics of farming. Likewise, we assume that all fruit-bearing trees are mature. The reader should therefore interpret this only as a **high-level view of potential gross values** of tree fruit production on the irrigated acres of study area parcels. One production scenario for each of the three fruit types is considered. These production scenarios assume that only one fruit type is produced on the irrigated acres of study area parcels (i.e. 'only' sweet cherries, 'only' commercial apples, or 'only' Bartlett pears).

Water rights records report a total irrigated acreage corresponding to the water right certificate. This acreage **does not** necessarily correspond to the acreage of the parcel. **Thus, a portion of the irrigated acres may not reside on WDFW-owned parcels.**[59]

All values are reported in 2013 U.S. Dollar price levels. Values that were initially estimated for other price level years are converted to 2013 price levels using GDP deflators.

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[56] *USDA, 2007 Census of Agriculture, County Profile: Okanogan County, Washington. http://www.agcensus.usda.gov/Publications/2007/Online_Highlights/County_Profiles/Washington/cp53047.pdf*

[57] *USDA Economics, Statistics and Market Information System, NASS, Noncitrus Fruits and Nuts. http://usda.mannlib.cornell.edu/MannUsda/viewDocumentInfo.do?documentID=1113*

[58] *USDA Noncitrus Fruits and Nuts, 2011 Summary. ISSN 1948:2698. P.77, Statistical Methodology. http://usda01.library.cornell.edu/usda/nass/NoncFruiNu//2010s/2012/NoncFruiNu-07-06-2012.pdf*

[59] *Water rights records reflect the name of the claimant, which may not be the name of the current owner.*

### 5.4.1 Bearing Acreage

To refine estimated gross values of production, the total number of irrigated acres on the study area parcels was multiplied by the percent of total acres of bearing trees, by fruit type, for Okanogan County.

Total acres, bearing acres and non-bearing acres were reported by the 2007 USDA Census of Agriculture (USDA 2009).[60] The percent of total acres with bearing apples trees in 2007 was 91.27%. If the ratio held, there would be an equivalent 1,019.67 acres of bearing apple trees on the irrigated acres of study area parcels with water rights records.

The percent of total acres with bearing sweet cherry trees in 2007 was 83.83%. If the ratio held, there would be an equivalent 936.55 acres of bearing sweet cherry trees on the irrigated acres of study area parcels with water rights records.

The percent of total acres with bearing Bartlett pear trees in 2007 was 82.40%. If the ratio held, there would be an equivalent 920.53 acres of bearing Bartlett pear trees on the irrigated acres of study area parcels with water rights records.

Estimated bearing acres on the Study Area parcels with water rights records, by fruit type, is presented by Table 30.

**Table 30. Estimated Bearing Acres on Study Area Parcels**

| Fruit Type | Total Acres | Bearing Acres | Percent Bearing | Bearing Acres Study Area Parcels |
|---|---|---|---|---|
| Apples | 16,151 | 14,741 | 91.27% | 1,020 |
| Cherries, Sweet | 3,828 | 3,209 | 83.83% | 937 |
| Pears, Bartlett | 1,227 | 1,011 | 82.40% | 921 |

*Sources: USDA Census of Agriculture (2007); USDA, Quick Stats 2.0*

### 5.4.2 Sweet Cherries Scenario

Sweet cherry data is reported by USDA NASS on an all-varieties basis. The average yield from fruit bearing trees from 2003 to 2012 was 5.19 tons per acre. The average price per ton for fresh sweet cherries was $2,592 (2013 dollars) over the same time period (Table 31).[61]

[60] *USDA, Quick Stats 2.0. http://quickstats.nass.usda.gov/*

[61] *USDA Noncitrus Fruits and Nuts, 2011 Summary. Page 74, Price and Value Definitions. Price for fresh fruit in Washington represents the equivalent return at the packinghouse door.*

**Table 31. Sweet Cherries, Fresh, Average Yield and Price (2003-2012)**

| Year | Yield (tons per acre) | Price (ton) ($ 2013) |
|---|---|---|
| 2003 | 4.37 | $ 2,015 |
| 2004 | 4.62 | $ 2,655 |
| 2005 | 4.72 | $ 3,279 |
| 2006 | 5.25 | $ 2,214 |
| 2007 | 4.76 | $ 2,628 |
| 2008 | 3.03 | $ 3,598 |
| 2009 | 7.00 | $ 1,268 |
| 2010 | 4.59 | $ 2,865 |
| 2011 | 5.76 | $ 3,223 |
| 2012 | 7.76 | $ 2,172 |
| **Average** | 5.19 | $ 2,592 |

*Source: USDA-NASS data, Noncitrus Fruits and Nuts (2003-2012)*

The average yield, 5.19 tons per acre, multiplied by the fruit bearing acreage of the study area parcels with irrigated acres (936.55 acres) is 4,860.69 total tons of sweet cherries. At an average price per ton of $2,592, the estimated gross value of the 'only' sweet cherries production scenario is $12,598,908 (2013 dollars), based on historic averages.

### 5.4.3 Commercial Apples Scenario

Commercial apple data is reported by USDA NASS on an all-varieties basis. Price data for commercial apples is not reported for 2012. The average yield from fruit bearing trees from 2003 to 2011 was 17.74 tons per acre. The average price per ton for fresh commercial apples was $666 (2013 dollars) over the same period (Table 32).[62]

[62] *Ibid.*

**Table 32. Commercial Apples, Fresh, Average Yield and Price (2003-2011)**

| Year | Yield (tons per acre) | Price (ton) ($ 2013) |
|---|---|---|
| 2003 | 14.70 | $ 772 |
| 2004 | 19.70 | $ 366 |
| 2005 | 18.15 | $ 528 |
| 2006 | 18.00 | $ 704 |
| 2007 | 17.00 | $ 854 |
| 2008 | 18.45 | $ 582 |
| 2009 | 17.00 | $ 684 |
| 2010 | 18.15 | $ 676 |
| 2011 | 18.55 | $ 830 |
| **Average** | 17.74 | $ 666 |

*Source: USDA-NASS data, Noncitrus Fruits and Nuts (2003-2011)*

The average yield, 17.74 tons per acre, multiplied by the fruit bearing acreage of the study area parcels with irrigated acres (1,019.67 acres) is 18,093.48 total tons of commercial apples. At an average price per ton of $666, the estimated gross value of the 'only' commercial apples production scenario is $12,050,258 (2013 dollars), based on historic averages.

### 5.4.4 Bartlett Pears Scenario

Bartlett pears only are considered, as USDA NASS does not report price data on an all-varieties basis. The average yield from fruit bearing trees from 2003 to 2012 was 16.34 tons per acre. The average price per ton for fresh Bartlett pears was $629 (2013 dollars) over the same period (Table 33).[63]

[63] *Ibid.*

**Table 33. Bartlett Pears, Fresh, Average Yield and Price (2003-2012)**

| Year | Yield (tons per acre) | Price per ton (2013) |
|---|---|---|
| 2003 | 16.10 | $ 645 |
| 2004 | 14.90 | $ 634 |
| 2005 | 14.90 | $ 672 |
| 2006 | 15.00 | $ 722 |
| 2007 | 14.80 | $ 627 |
| 2008 | 15.10 | $ 642 |
| 2009 | 16.90 | $ 502 |
| 2010 | 16.80 | $ 614 |
| 2011 | 19.80 | $ 562 |
| 2012 | 19.10 | $ 666 |
| **Average** | 16.34 | $ 629 |

*Source: USDA-NASS data, Noncitrus Fruits and Nuts (2003-2012)*

The average yield, 16.34 tons per acre, multiplied by the fruit bearing acreage of the study area parcels with irrigated acres (920.53 acres) is 15,041.46 total tons of Bartlett pears. At an average price per ton of $629, the estimated gross value of the 'only' Bartlett pears production scenario is $9,461,078 (2013 dollars), based on historic averages.

Table 34 presents a summary of the estimated total tons of production and estimated gross values of production for the three fruit types.

**Table 34: Summary – Fruit Production Scenarios**

| Fruit Type | Estimated total tons of production | Price per ton | Estimated gross value of production |
|---|---|---|---|
| Apples | 18,093 | $ 666 | $ 12,050,258 |
| Cherries, Sweet | 4,861 | $ 2,592 | $ 12,598,908 |
| Pears, Bartlett | 15,041 | $ 629 | $ 9,461,078 |

*Source: USDA-NASS data, Noncitrus Fruits and Nuts (2003-2012)*

# SECTION 6: ECONOMIC IMPACTS OF ACTIVITIES ON WDFW LANDS

## 6.1 INTRODUCTION

As part of its mission, WDFW is charged with ensuring the highest benefits to fish and wildlife on Department-owned lands, rather than maximizing opportunities for revenue production. For example, RCW 77.04.12 directs WDFW to "…..*conserve the wildlife and food fish, game fish, and shellfish resources in a manner that does not impair the resource".*"[64]

Even so, the array of activities on WDFW-owned lands provides economic contribution to Okanogan County. These activities include public recreation, continued agricultural uses such as crop leases and grazing permits, and the presence of restoration projects.[65] This section presents a conservative approach to quantifying the impacts of economic activity on WDFW-owned lands in the County. **Note that this section considers all WDFW-owned lands in the County, not just the study area parcels.**

## 6.2 ASSESSING ECONOMIC IMPACT

An economic impact model was developed to monetize the impact of activities associated with agricultural use, restoration projects, and recreation on WDFW-owned lands to Okanogan County.

Economic IO (input-output) modeling is used to estimate the impact of business activity changes or to calculate the contributions of an industry to a region's economy. The basic premise of the IO framework is that each industry sells its output to other industries and final consumers, and in turn purchases goods and services from other industries and primary factors of production. Thus, the economic performance of each industry can be determined by changes in both final demand and the specific inter-industry relationships. IO tables assist in calculating overall changes in the flow of money in the local and regional economy, including direct, indirect, and induced effects.

**Direct effects** occur when the Department (or its contractors or farmers, etc.), spend on goods and services, wages, materials and other WDFW-owned lands-related expenditures. These are typically referred to as direct costs of operation. **Indirect effects** occur when consequent purchases made by suppliers of materials and services to sustain the direct expenditures. **Induced effects** occur when workers in the sectors stimulated by direct and indirect expenditures spend their additional incomes on consumer goods and services. **Total effect** is the sum of direct, indirect and induced effects.

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[64] *RCW 77.04.12. Mandate of department and commission.*

[65] WDFW did not lease any sites in Okanogan County for communications purposes or for wind energy production in Fiscal Year 2012 or 2013, thus these activities were not considered in this analysis.

For example, consider a farmer on a crop lease on WDFW land. To produce a forage crop, the farmer spends on goods at the local retail farm supply store. This transaction is a direct effect. To stock the item, the store must purchase the goods from a supplier. This transaction is an indirect effect. The store clerk receives wages from his/her labor, and in turn purchases consumer goods and services. These transactions are induced effects.

In this analysis, the effects are those associated with income and expenditures related to the industry activities for agriculture, recreation or restoration. The outputs are shown as estimates of changes in employment, personal income, business output, and value added (gross regional product).

**Employment** figures represent the total employment (full-time equivalent, or FTE, jobs) generated by the direct expenditures, measured in person-years. **Personal income** is the amount generated by a sector's activity, through wages, salaries and profits, to the local economy. The **output** (business output/sales) results reflect how much money is "stirred up" in the economy, though does not mean that someone in the local area is making a wage or profit from this money. **Value Added** figures represent the total value of the production of goods and services in the economy resulting from direct expenditures under analysis (valued at market prices).

The approach used here, joins that of an IO survey model, which involved obtaining data on the distribution of local sales for each sector, together with that of the IMPLAN (Impact Analysis for PLANning), which uses secondary data to construct estimates of local economic activity. The current economic impact of pertinent industries in Okanogan County was estimated using 2011 IMPLAN. IMPLAN is a computerized database and modeling system used for creating economic models and IO tables.[66] IMPLAN can be used to construct zip code, county or multi-county IO models for any region in the United States. The regional models are derived from technical coefficients of a national IO model and localized estimates of total gross outputs by sectors. IMPLAN adjusts national level data to fit the economic composition and estimated trade balance of a chosen region.

One IMPLAN data set, Okanogan County, Washington, was used to develop the model for these analyses.[67] To ensure consistency, the base year for the analyses was 2013 and all dollar amounts are expressed in 2013 U.S. dollars.

### 6.2.1 Grazing Permits

Livestock grazing on WDFW lands is permitted where consistent with desired ecological conditions for those lands, or with the Department's Strategic Plan. Grazing is used to manipulate vegetation

[66] IMPLAN was originally developed by researchers at the University of Minnesota working with the U.S. Forest Service in cooperation with the Federal Emergency Management Agency and the U.S. Department of the Interior, Bureau of Land Management to assist in land and resource management planning. In 1993, its founders incorporated as Minnesota IMPLAN Group, Inc. (MIG) and have expanded to improve the original system. Today, software and data sets are available through IMPLAN Group LLC, Huntersville, NC.
[67] *IMPLAN version 3.0.*

for fish and wildlife, accomplish a specific habitat objective, or facilitate coordinated resource management, and it is integrated with other uses to ensure the protection of all resource values. Managed grazing may also be used to control invasive weeds, or to stimulate the growth of plants that provide food for wildlife.

WDFW issues grazing permits for livestock grazing on Department lands, as allowed by Washington Administrative Code (WAC) 232-12-181(1): "*The director is authorized to enter into grazing permits when the director determines that a grazing permit will be consistent with the desired ecological condition for those lands or the department's strategic plan."*[68] Further, WAC 232-12-181(2) states that "*The director shall negotiate grazing permits with potential grazing operators to ensure the highest benefits to fish and wildlife."*

This analysis considers the economic impact of grazing permits issued on WDFW lands in Okanogan County. Thus, it is limited to considering the revenue provided through permitted Animal Unit Month (AUM) fees and in-kind services for range improvements, fencing, etc. Note that this analysis does not consider the economic impact of livestock grazing, such as examining animal production costs.

### Data collection

The WDFW Real Estate Office provided data on grazing permits on WDFW-owned lands in Okanogan County. Fiscal Year 2012 is the most current year for revenue.[69]

WDFW administered 20 grazing permits on 35,619 total acres in Okanogan County in 2012. These leases generated $22,533 in revenue, and permit holders provided $4,836 worth of in-kind services.[70] Three new grazing permits on 950 acres began in 2013; however as 2013 revenue and in-kind services data was not available at the time of the study; effects due to these additional 950 acres could not be estimated.

### Analysis

The economic impact analysis for grazing on WDFW lands in Okanogan County consisted of inserting the revenue provided from AUM fees and in-kind services attributable to grazing permits issued on the four Wildlife Areas into the modeling framework, using standard IMPLAN values for the cattle ranching sector in Okanogan County.

Model results indicate that grazing permit-related activity generated $23,595 in direct output in Okanogan County (Table 35). Considering indirect and induced effects, the total economic

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[68] *WAC 232-12-181. Livestock grazing on department of fish and wildlife lands.*
[69] *Kane, E., WDFW Real Estate Office, electronic communication, December 10, 2013.*
[70] *Sprague, C., WDFW Lands Division Manager, electronic communication, February 28, 2104. In-kind services are goods or services that a permit holder or lessee would typically purchase locally or perform themselves in place of cash payment, such as range improvements or minor fence maintenance in the case of grazing permits.*

impact of grazing permits on WDFW lands in Okanogan County is estimated to be $52,989 (2013 dollars). This economic activity supported an estimated 0.7 jobs with labor earnings of $11,338.

**Table 35. Economic Impact of Grazing Permits Issued on WDFW Lands in Okanogan County**

| Impact Type | Direct Effect | Indirect Effect | Induced Effect | Total Effect |
|---|---|---|---|---|
| Output | $ 23,595.30 | $ 24,408.60 | $ 4,985.10 | $ 52,989.00 |
| Employment | 0.3 | 0.3 | 0.0 | 0.7 |
| Income | $ 4,532.30 | $ 5,494.60 | $ 1,311.50 | $ 11,338.40 |
| Value Added | $ 4,849.70 | $ 7,861.70 | $ 3,045.80 | $ 15,757.30 |

*Source: Resource Dimensions, 2014*

### 6.2.2 Crop Leases

Crop leases on WDFW lands are agreements where a farmer (lessee) plants and manages crops. Plantings provide food and cover for fish and wildlife, consistent with WDFW's mission. For the use of state public property, the lessee pays the department a fee, which may be cash or an in-kind value that might include crops left standing (for food and cover) or services provided. Services provided could include the requirement to plant a winter cover crop after harvest that provides food and cover for wildlife and manages soil health and stability.

This analysis considers the economic impact of crop leases on WDFW lands in the County, including the contribution of revenue from leases, and the contribution of expenses for farming inputs.

#### Data collection

The WDFW Real Estate Office provided data on crop leases on Department-owned lands in Okanogan County. Fiscal Year 2012 is the most current year for revenue.[71]

WDFW administered 12 crop leases on 1,128 total acres in Okanogan County in 2013. These leases generated $7,655 in revenue, and lessees provided $24,527 worth of in-kind services.

Crop lease data provided by WDFW includes the township and range of each lease. We identified the specific unit that each lease resides on using the 'Detailed Land Ownership & Resource Map' for the four Wildlife Areas. The Wildlife Area management plan for each Wildlife Area describes the type of agricultural production on each unit, e.g., dryland farming or irrigated; alfalfa farming or grain farming, etc. As a result of cross-referencing it was determined that the crop leases on which revenue was paid in 2013 are for forage crops (i.e. alfalfa farming).

Crop lease terms require lessees to furnish all labor, fertilizer, weed control, equipment, supplies and repairs, and to perform regular fence maintenance. Inputs farmers were assumed to require include the costs of seed, fertilizer, herbicide, supplies, repairs, and fuel.

[71] *Kane, E., electronic communication, December 10, 2013.*

To estimate spending per acre on farming inputs on WDFW lands, a literature review was conducted to identify the cost of inputs for forage crop farming in Washington. Hinman, et al. conducted the most recent survey of producers, local farm service agencies, farm suppliers and machinery costs in 2008 (Hinman, et al. 2009)[72]. The survey respondents included "Columbia Basin producers considered representative of well-managed farms provided the data for this study". Though Okanogan County is not in the Columbia Basin, this study is the geographically closest to Okanogan County, and thus most closely representative of local costs.

All values for cost inputs are reported in 2013 U.S. Dollar price levels. Values initially estimated for other price level years are converted to 2013 price levels using GDP deflators.

The hourly machine labor rate reported by Hinman, et al. is $21.48. We assume this is the hourly rate of lessee or hired labor to farm WDFW crop leases. The total estimate of labor cost to farm WDFW crop leases was estimated to be $13,326.

Seed costs were assumed for the year of establishing the crop. Five leases totaling 222 acres began in 2013; thus, the cost of seed was calculated for 222 acres, for alfalfa. Seeding rates are assumed to be 20 pounds of seed per acre (Hinman, et al. 2009; USDA IPM).[73] At a price of $3.22 per pound (Hinman, et al. 2009), total seed cost for the 222 acres planted in 2013 is estimated to be $14,297.

Fertilizer mix and rates are site-specific (Hinman, et al., 2009). We use the typical fertilizer mix as reported by Hinman, et al. for alfalfa farming. As in the case of seeding, we assumed that dry nitrogen fertilizer is needed only when a stand is established. Thus, the cost of nitrogen fertilizer is calculated only for the five leases beginning in 2013. Applying 25 pounds of nitrogen fertilizer per acre, at a price of $13.25 per acre (Hinman, et al. 2009), yields a total nitrogen fertilizer cost for the 222 acres planted in 2013 of $2,942.

Total costs for phosphate fertilizer and potash fertilizer are calculated on 1,128 acres. Applying 100 pounds of phosphate fertilizer per acre, at a price of $126.00 per acre (Hinman, et al. 2009), total expense on phosphate fertilizer is estimated to be $142,128. Applying 75 pounds of potash per acre, at a price of $56.25 per acre (Hinman, et al. 2009), total potash costs are estimated at $63,450. The total estimated cost of fertilizer applied to WDFW crop leases in 2013 is estimated to be $208,520.

The cost per acre of herbicides is assumed to be $12.89, for a total estimated expense of $14,540 on WDFW crop leases. Note, this is a typical estimate; specific chemicals and rates of application are site-specific (Hinman, et al. 2009).

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[72] *Hinman, et al. 2009. 2009 Cost of Producing Alfalfa Hay Under Center Pivot Irrigation in the Columbia Basin of Washington State. Washington State University Extension. EM007. http://cru.cahe.wsu.edu/CEPublications/EM007/EM007.pdf*

[73] *USDA, National Institute of Food and Agriculture, Integrated Pest Management Centers. 2006. Crop Profile for Alfalfa in Washington. March 2006. Page 4. http://www.ipmcenters.org/cropprofiles/docs/WAalfalfa.pdf*

Two inputs, lubricants and machinery repairs, were considered as other appurtenants to farming. The total cost per acre of these inputs is assumed to be $10.85 (Hinman, et al. 2009), for an estimated total expense of $12,239 on WDFW crop leases.

Fuel use rate was assumed to be 6.30 gallons per acre (Hinman, et al. 2009). The average price of on-highway diesel fuel for 2013 was $4.28 (April 2012-April 2013) (WSDOT 2013).[74] It is difficult to derive an estimate for bulk delivery of off-highway diesel fuel, as fuel would likely be purchased for use by farmers. To develop a rough estimate for the average price of off-highway diesel fuel in 2013 in Washington, we subtracted $0.375 – the total Federal and State Motor Fuels Tax on diesel fuel in Washington – to derive an estimated per gallon price of $3.91 (EIA 2012).[75] Note this figure is likely greater than the price for off-highway diesel fuel via bulk delivery. Thus, the average estimated per acre cost for diesel fuel is $24.63, for an estimated total expense of $27,786 on WDFW crop leases.

Considering **only** the abovementioned inputs, the total estimated expense on inputs for alfalfa farming on crop leases on WDFW lands in Okanogan County was $290,707 in 2013 (Table 36).

**Table 36. Expenditures on Crop Leases on WDFW Lands in Okanogan County**

| Input | Quantity per acre | Unit | Cost/unit | Cost/acre | Total Expense on WDFW Crop Leases |
|---|---|---|---|---|---|
| Fertilizer | | | | | |
| Nitrogen | 25 | lb | $ 0.53 | $ 13.25 | $ 2,941.50 |
| Phosphate | 100 | lb | $ 1.26 | $ 126.00 | $ 142,128.00 |
| Potash | 75 | lb | $ 0.75 | $ 56.25 | $ 63,450.00 |
| Subtotal | | | | | $ 208,519.50 |
| Fuel | 6.3 | gal | $ 3.91 | $ 24.63 | $ 27,786.02 |
| Labor | 0.55 | ac | $ 21.48 | $ 11.81 | $ 13,326.19 |
| Seed | 20 | lb | $ 3.22 | $ 64.40 | $ 14,296.80 |
| Supplies and Repairs | | | | | |
| Lubricants | 1 | ac | $ 2.38 | $ 2.38 | |
| Machinery Repairs | 1 | ac | $ 8.47 | $ 8.47 | |
| Subtotal | | | | $ 10.85 | $ 12,238.80 |
| Weed Control (Herbicide) | 1 | ac | $ 12.89 | $ 12.89 | $ 14,539.92 |
| **Total** | | | | | $ 290,707.24 |

*Source: Hinman, et. al 2009; Resource Dimensions, 2014*

[74] *Washington State Department of Transportation. 2013. The Fuel and Vehicle Trends Report. ISSN 1948-2388. Page 8. http://www.wsdot.wa.gov/NR/rdonlyres/5EDEBF3D-4617-4A51-ADB7-61842F1ABC02/0/FuelandVehicleTrendsApr2013.pdf*

[75] *Energy Information Administration. 2012. Petroleum Marketing Monthly, February 2012. Page 153. http://www.eia.gov/pub/oil_gas/petroleum/data_publications/petroleum_marketing_monthly/current/pdf/enote.pdf*

### Analysis

The economic impact analysis for crop leases on WDFW lands in Okanogan County consisted of inputting lease revenue, in-kind services and spending on farming inputs data into the Okanogan County model, using standard IMPLAN values for crop farming, retail stores, industrial machinery repair and maintenance sectors in Okanogan County.

Model results indicate that crop-leasing activity generated $100,518 in direct output in Okanogan County (Table 37). Considering indirect and induced effects, the total economic impact of crop leasing activity on WDFW lands in Okanogan County is estimated at $182,894 (2013 dollars). This economic activity supported an estimated 2.1 jobs, with labor earnings of $71,083.

**Table 37. Economic Impact of Crop Leases Issued on WDFW Lands in Okanogan County**

| Impact Type | Direct Effect | Indirect Effect | Induced Effect | Total Effect |
|---|---|---|---|---|
| Output | $ 124,467.10 | $ 27,047.60 | $ 31,379.40 | $ 182,894.00 |
| Employment | 1.5 | 0.3 | 0.3 | 2.1 |
| Income | $ 55,574.80 | $ 7,249.70 | $ 8,258.30 | $ 71,082.80 |
| Value Added | $ 75,738.20 | $ 16,007.50 | $ 19,174.40 | $ 110,920.20 |

*Source: Resource Dimensions, 2014*

Table 38 summarizes the economic impact of continued agriculture (i.e. grazing permits and crop leases) on WDFW lands in Okanogan County. Model results indicate that this agricultural activity generated $148,062 in direct output in Okanogan County. Considering indirect and induced effects, the total economic impact of continued agriculture on WDFW lands in Okanogan County is estimated at $235,883 (2013 dollars). This economic activity supported an estimated 2.8 jobs, with labor earnings of $82,421.

**Table 38: Economic Impact of Continued Agriculture on WDFW Lands in Okanogan County**

| Impact Type | Direct Effect | Indirect Effect | Induced Effect | Total Effect |
|---|---|---|---|---|
| Output | $ 148,062 | $ 51,456 | $ 36,365 | $ 235,883 |
| Employment | 1.8 | 0.6 | 0.3 | 2.8 |
| Income | $ 60,107 | $ 12,744 | $ 9,570 | $ 82,421 |
| Value Added | $ 80,588 | $ 23,869 | $ 22,220 | $ 126,678 |

*Source: Resource Dimensions, 2014*

### 6.2.3 Restoration Projects on WDFW Lands in Okanogan County

Intertwined with WDFW's mission is to protect and restore habitats to enable the long-term sustainability of fish and wildlife populations and the ecosystems they depend upon. This analysis considers the economic impact of restoration-related activity on WDFW lands in Okanogan County.

#### Data collection

The managers of the four Wildlife Areas in Okanogan County were surveyed to determine the economic contributions attributable to restoration activities on WDFW lands in Okanogan County. Specific items of interest included:

- The nature of restoration efforts;
- Direct employment (WDFW employees) and indirect employment (contractors, consultants, etc.) attributable to restoration efforts; and
- Direct spending on restoration efforts, including that by project partners.

WDFW employment directly attributed to restoration efforts totaled an annual average of 9.5 Full-time equivalent (FTE) jobs across the four Wildlife Areas over 2009 to 2013; and contractor and consultant employment directly attributable to restoration efforts totaled a yearly average of 5.7 FTE jobs across the four Wildlife Areas. Direct spending on restoration efforts across the four Wildlife Areas totaled $2,424,400 in 2013. These expenditures were toward activities such as habitat restoration, forest thinning, fuels reduction, etc.

#### Analysis

The economic impact analysis for restoration projects on WDFW lands in Okanogan County consisted of inputting the employment and spending data into the Okanogan County model, using standard IMPLAN values for the government employment, environmental and technical consulting services, and support activities for forestry sectors in Okanogan County.

Model results indicate that restoration project-related activity generated $2,154,410 in direct output in Okanogan County (Table 39). Considering indirect and induced effects, the total economic impact of restoration project-related activity on WDFW lands in Okanogan County is estimated to be $3,167,226 (2013 dollars). This economic activity supported an estimated 51.4 jobs with labor earnings of $1,409,140.

**Table 39. Economic Impact of Restoration Projects on WDFW Lands in Okanogan County**

| Impact Type | Direct Effect | Indirect Effect | Induced Effect | Total Effect |
|---|---|---|---|---|
| Output | $ 2,154,410 | $ 386,852 | $ 625,964 | $ 3,167,226 |
| Employment | 42.0 | 4.0 | 5.4 | 51.4 |
| Income | $ 1,139,230 | $ 105,159 | $ 164,751 | $ 1,409,140 |
| Value Added | $ 1,355,032 | $ 203,941 | $ 382,499 | $ 1,941,473 |

*Source: Resource Dimensions, 2014*

### 6.2.4 Recreation

Facilitating recreation on WDFW lands is a major component of the Department's mission. For example, RCW 77.04.012 directs the Fish and Wildlife Commission to "*attempt to maximize the public recreational game fishing and hunting opportunities of all citizens."*[76] Further, RCW 77.12.880 governs wildlife viewing on WDFW lands: "*The department shall manage wildlife programs in a manner that provides for public opportunities to view wildlife and supports nature-based and wildlife viewing tourism without impairing the state's wildlife resources."*[77] Also, crop lease and grazing permit terms include the proviso that public recreation is to be allowed on the leased land.

There are many types of recreation on the four Wildlife Areas in Okanogan County. Table 40 reflects those found within the four WDFW Wildlife Areas.

**Table 40. Recreation uses on four WDFW Wildlife Areas in Okanogan County**

| Wildlife Area / Recreational Uses | Bird watching | Boating | Camping | Dog Training/Trials | Fishing/Angling | Group events & tours | Hiking | Horseback riding | Hunting | Mountain biking | Nordic skiing & snowshoeing | Dog walking | Shooting sports / Archery range | Trapping | Wildlife viewing |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Methow | ● | | ● | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Scotch Creek | ● | | ● | | ● | | ● | ● | ● | ● | | ● | | | ● |
| Sinlahekin | ● | ● | ● | ● | ● | ● | ● | ● | ● | | ● | | ● | ● | ● |
| Wells | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |

*Source: Resource Dimensions, 2014*

Given the variation in data available for each of the Wildlife Areas, this analysis considers the economic impact of recreation use of the Scotch Creek Wildlife Area (SCWA) as representative, given that the available data were most complete and readily verified through other resources.

#### Data collection

To best capture local spending attributable to recreation, a site-specific study is conducted, in the form of a visitor intercept survey or other survey method wherein site-specific use data and spending data is collected. This analysis is limited due to the impracticalities of conducting such a survey within the constraints of this study.

[76] *RCW 77.04.12.*
[77] *RCW 77.12.880. Wildlife program management.*

Thus, we analyzed a case study of three types of recreation of the SCWA. The SCWA Wildlife Area manager was surveyed regarding employment attributable to recreation, and user-days by recreation type on SCWA. WDFW employment attributable to recreation totals 0.33 FTE jobs annually of the SCWA. No contractors are employed for recreation use of the SCWA. The annual average user-days by recreation type on all seven units of the SCWA totaled 1,000 hunter-days, 300 angler-days, and 100 wildlife viewer-days.[78, 79]

Recreation use of public lands spurs local spending. USFWS conducts a national survey every five years of fishing, hunting and wildlife-associated recreation. The most recent edition, revised in January 2014, uses survey data from 2011 regarding average trip expenditures per user-day for angling, hunting and wildlife viewing.[80] Average trip expenditures per user-day for recreation in Washington, using values derived for activities in Washington by residents *and* non-residents, were used to inform economic impact modeling.[81]

### Estimated expenditures

The average annual days of participation in Washington, by residents and non-residents is 14 user-days per angler, 12 user- days per hunter, and 11 user-days (away from home) of wildlife viewing.[82]

USFWS survey data provides total annual estimated trip expenditures, by user, for the three types of recreation. Categories of expenditures include food, lodging, transportation, equipment, and other expenses as appropriate (e.g. fees, bait, heating, cooking fuel, etc.). Total annual estimated trip expenditures were divided by the average annual days of participation to derive per trip estimates for each category of expenditure.

Per trip estimates were multiplied by the total user-days per type of recreation to calculate total estimated trip expenditures attributable to recreation on the SCWA. The total expenditures, by type, for angling, hunting and wildlife viewing on the SCWA is estimated to be $113,556 (Table 41).

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[78] *Olson, J., SCWA Wildlife Area Manager, electronic communication, January 13, 2014.*
[79] *Ibid. Electronic communication, March 27, 2014. The total acreage of SCWA at the time of this data collection was 24,947 acres.*
[80] *Wildlife viewing includes observing, photographing, and feeding fish or wildlife.*
[81] *USFWS, 2011 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation, Washington. FHW/11-WA (RV). Revised January 2014. http://www.census.gov/prod/2013pubs/fhw11-wa.pdf*
[82] *Ibid.*

**Table 41. Total Expenditures for Recreation on the SCWA**

| Expenditure Type | Hunting (total) | Angling (total) | Wildlife Viewing (total) | Total by Expenditure Type |
|---|---|---|---|---|
| Food | $ 23,170 | $ 2,979 | $ 2,327 | $ 28,476 |
| Lodging | $ 5,500 | $ 705 | $ 836 | $ 7,041 |
| Transportation | $ 28,830 | $ 3,771 | $ 1,209 | $ 33,810 |
| Other | $ 4,250 | $ 4,758 | $ 400 | $ 9,408 |
| Equipment | $ 29,000 | $ 4,821 | $ 1,000 | $ 34,821 |
| **Total** | $ 90,750 | $ 17,034 | $ 5,772 | $ 113,556 |

*Source: Resource Dimensions, 2014*

## Analysis

The economic impact analysis for recreation on the SCWA consisted of inputting the employment and spending data into the Okanogan County model, using standard IMPLAN values for the government employment, retail stores, and lodging sectors in Okanogan County.

Model results indicate that recreation on the SCWA generated $58,696 in direct output in Okanogan County (Table 42). Considering indirect and induced effects, the total economic impact of recreation on the SCWA in 2012 is estimated to be $84,192 (2013 dollars). This economic activity supported about 1.2 jobs with labor earnings of $38,637.

**Table 42. Economic Impact of Recreation Use of the Scotch Creek Wildlife Area**

| Impact Type | Direct Effect | Indirect Effect | Induced Effect | Total Effect |
|---|---|---|---|---|
| Output | $ 58,696 | $ 8,461 | $ 17,035 | $ 84,192 |
| Employment | 1.0 | 0.1 | 0.1 | 1.2 |
| Income | $ 32,088 | $ 2,066 | $ 4,483 | $ 38,637 |
| Value Added | $ 43,888 | $ 4,818 | $ 10,409 | $ 59,115 |

*Source: Resource Dimensions, 2014*

# SECTION 7: ECONOMIC CONTRIBUTIONS OF CONSERVED LANDS

## 7.1 INTRODUCTION

Conservation of land and its appurtenant resources provides economic benefits to Okanogan County through a multitude of ecosystem services – the products and services produced by the environment. Ecosystem services provided by natural processes, aesthetic values and non-consumptive resource use can impact the fiscal health of a community through reducing costs (Caudill and Henderson 2004; Newcome, et al 2005). This section provides an abridged look at the value of ecological services and resulting economic benefits produced by conserved lands under the ownership of WDFW within Okanogan County, on the study area parcels. Given the limitations of this study, our focus is on a finite subset of services **on the study area parcels only**.

The 1997 book, *Nature's Services*, describes the myriad of ways that natural systems and functions, collectively referred to as ecosystem services, produce benefits to society (Daily 1997, Brown, 2001). Ecosystem services represent the conditions or processes that sustain and fulfill human life.

The stream of economic benefits that flow to and through Okanogan County and its communities near WDFW lands include use benefits derived from goods and services delivered by recreational trails, greenways, and protected areas. Use benefits or values are both direct and indirect. Direct use benefits include things like lodging, fees paid to outfitters, food, clothing, equipment purchases and rentals, fuel, local arts, gifts, etc.

Indirect use benefits, however, while more passive, are functional in nature. Examples include goods and services such as water supply, fish and wildlife habitat, flood control, water filtration, nutrient cycling, erosion control, air purification, the provision of wildlife viewing, photography and recreational opportunities, cultural resources, viewsheds, and amenity values.

These conditions or processes produce benefits that have economic utility or satisfy an economic want. At times, the conversion of benefits into goods is clear and the linkages are accounted for by society through market trading. Frequently, however, the connections are not explicit given the way we presently measure costs and benefits. This examination seeks to shed light on these connections by accounting for several services or goods not traded directly in markets, like those associated with wetland functions, on the study area parcels.

A benefit function transfer approach, explained in Section 7.4, is used to estimate certain economic values associated with WDFW conservation efforts in Okanogan County by adapting estimates available from studies that have been completed in a similar context.

## 7.2 OBJECTIVES

Increasingly, governments are aware that decisions about economic sustainability and resource management that overlook the vast values produced by ecosystems, an indispensable complement to the human-created economy, may leave us worse, not better, off. When ecological services are lost through inadequate planning, taxpayers and governments incur significant costs to replace these services. Some services can be only partially replaced, and some can never be replaced by any dollar investment.

Interference with or degradation of ecosystem services can result in a decline in water quality, air quality, soil stability, and biodiversity that leads to a decrease in the quality of life for our communities. With our improved grasp on humanity's profound dependence on ecological services, economists have worked to develop and improve ways to measure the complex of ecosystem service values. The objective of ecosystem economics is to quantify and value the ecological and economic benefits of services protected or restored, and to use this information to improve land use and resource management decision-making. The overall objective is to raise awareness of the economic value of ecosystem services provided by WDFW lands to Okanogan County, and more broadly to Washington State.

## 7.3 ECOSYSTEM SERVICE VALUATION

Studies conducted to date on the value of ecological services produced by nature, for example the state's fish and wildlife habitat, indicate that such habitat is producing services worth many billions of dollars annually. Yet, as with this study, these analyses tend to examine a finite services set, limited to those services upon which a comprehensive valuation has been performed. While the estimated $65.23 million in annual economic value (Table 44) generated by the study area may seem massive, given the limitations of the study and the fact that many values produced by ecological services are difficult to express in dollar figures, the true value of services is almost certainly underestimated here. Further, services not yet identified and their value to future generations is not included in our analysis.

When thoughtfully managed, natural systems produce substantial economic value that will provide in perpetuity to future generations. When natural systems are destroyed the services they performed are lost and communities pay (City of Portland: Lents Case Study 2004).

With the loss of natural storm protection, salmon productivity or water quality and supply services, residents are taxed to pay for levees, storm water systems, hatcheries and filtration plants that must be built. Communities incur real costs to replace services that were previously provided free and, unfortunately, on top of being costly, often replacement services are less capable than the ecosystem services they are replacing.

To understand the real economic costs of damaged natural systems in policy and decision-making, governments are increasingly considering ecosystems as economic assets. Given the values we can

name are greater than those for which we can establish prices or costs, ecosystem service values serve as markers for the minimum value of the true social value of the services provided – thus enabling us to replace the default value of $0.00 historically used in policy and decision-making frameworks (e.g., cost-benefit analysis, programmatic master planning).

### 7.3.1 On valuing ecosystem services

An ecosystem service is a "service flux," that is, its efficiency is measured as output per unit of time. Intact, healthy ecosystems are self-organizing; they provide valuable services in perpetuity at no cost to humans. The delivery of ecosystem services depends on maintaining a particular structure or arrangement of ecosystem constituents. Yields of ecological service fluxes as pollination and water filtration are distinct from "resource flows," like timber extraction. For example, while a single-species timber plantation might yield resource-flows (wood) for extraction, the timber plantation would not provide the same service-fluxes as an intact natural forest ecosystem. Specifically, service fluxes such as mitigation of floods, decomposition of wastes, renewal of soil, pollination, pest control, translocation of nutrients, and provision of habitat are not yielded by a timber plantation to the same degree as by a natural forest ecosystem. When it comes to generation of ecological services, the elements of the ecosystem, and their relationship to each other, matter.

To describe ongoing fluxes of ecosystem services, scientists and economists often describe the service-flux in terms of the dollar value it generates per unit of area over a given time period. It is also important to note that value is not fixed in time. The values of many ecological services are increasing as they become increasingly scarce (Boumans et al. 2002).

## 7.4 METHOD

To assess the economic contributions generated by ecosystem services provided by WDFW lands, given constraints on the study, benefit transfer methods were used where feasible. Similarly, only a limited set of ecosystem services could be feasibly valued within this project. The ecosystem services for which values are estimated:

- terrestrial habitat (total economic value is recreational use and passive use value);
- wetlands (habitat, flood control, nature-based recreation: angling, hunting, bird watching, aesthetic enjoyment/amenity, erosion control ,water supply, and the regulation of water quality); and
- aquatic habitat (nonuse values only).

These values are presented in Section 7.6. The benefit transfer approach used is outlined below following a brief introduction to non-market valuation approaches.

### 7.4.1 Valuation approaches

Over the past four decades, several economic methods have been developed to estimate the value of environmental goods and services that are not traded directly in markets (Borrisova-Kidder 2006).

These approaches to non-market valuation have developed principally within two branches of traditional economics – environmental, and natural resource economics. Generally, the methods can be broken into three primary categories – direct market valuation approaches (e.g., market price, avoided and replacement cost, production function), the use of individuals' actual behavior related to environmental services (revealed preference) and information collected in consumer surveys on hypothetical behavior related to environmental services (stated preference). Revealed preference methods include those as travel cost and hedonic pricing. Popular stated preference approaches include contingent valuation, choice modeling or choice experiments, and group valuation. Today, these valuation methods have been used to estimate values for virtually all ecosystem services for most forms of terrestrial, wetland, and aquatic habitats. Several thousands of value estimates for ecosystem services have been published in economic studies, reports and peer reviewed journals. However, conducting primary valuation research is time intensive and expensive, as it generally involves collecting primary data as well as fielding surveys. For this reason, methods referred to generally as "value transfer" have been developed to enable the transfer of estimated values from existing valuation studies to inform other policy contexts.

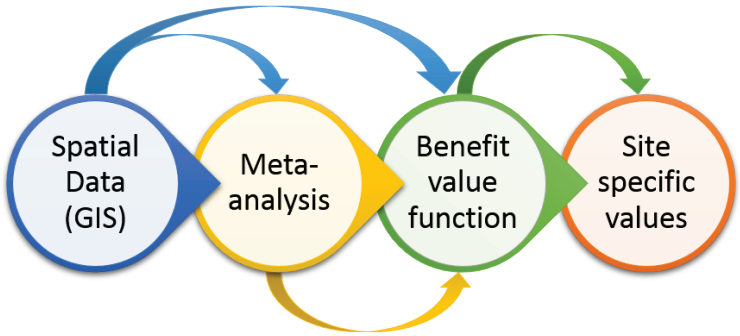
### 7.4.2 Value transfer approaches

Value transfer methods can be divided into three broad categories: unit value transfer (values are transferred with or without adjustments; usually for income differences); value function transfer (values are transferred using a value function from an individual primary study); and meta-analyses function transfer (values are transferred using a value function derived from the results of many primary studies).

Meta-analyses function transfer provides a relatively accurate approach to estimating benefit transfer by enabling controls for important differences in context and site variables. This method produces lower transfer errors than unit value and value function transfer. Also, this approach is well-suited to valuing diverse policy sites because the value function can be applied to a database containing site-specific information on habitat and relevant socioeconomic characteristics.

Primary elements of a meta-analysis benefit function transfer are shown in Figure 8. As is described in Section 7.4.8 and 7.4.9, the meta-analysis itself consists of a review of the available literature on the value of the ecosystem service of interest. Meta-analysis data is then used to estimate a value function that relates the service value to the characteristics of the ecosystem service. Characteristics might include the type and size of the resource lands, proximity to similar ecosystems, and the number of people that benefit (population). In this study, we use GIS to obtain information on some of these characteristics. Lastly, the characteristics of the policy site are plugged into the value function to estimate the value of the ecosystem services for the resource site.

**Figure 8. Components of meta-analyses benefit function transfer**




*Resource Dimensions, 2014.*

This study uses a number of meta-analysis value functions for different habitats and ecosystem services. These are introduced at the point that they are used in Section 7.5, below.

To evaluate the reliability of our value estimates, 95% prediction intervals are calculated for each value. The prediction interval provides an estimated range of values likely to include the unknown true ecosystem service value. The range is calculated from the meta-analysis sample data and the variation in predicted values. Thus, if we were to repeat the procedure continually, 95 times out of 100 the prediction interval would contain the unknown true service value. The prediction interval spectrum therefore gives an indication of how certain we are about the predicted value. A wide interval indicates high uncertainty.

For the purposes of this study, all ecosystem service values presented are obtained using the above benefit transfer protocol.

All values are reported in 2013 U.S. Dollar price levels. Values that were initially estimated for other price level years are converted to 2013 price levels using GDP deflators.

### 7.4.3 Benefits Transfer

Benefit transfer involves applying a monetary benefit value per unit estimate (e.g., per visitor day, per household, per acre) from an existing study site to an unstudied area for which a per unit benefit value is needed. Economists define benefits for economic efficiency or benefit-cost analyses as the user's willingness to pay (WTP) in excess of current costs (e.g., net WTP) or consumer surplus. This is the benefit measure used by federal agencies for benefit-cost analysis and natural resource damage assessment (U.S. Department of Interior, 1994; U.S. EPA, 2000; U.S. Office of Management and Budget, 2000).

### 7.4.4 Economic Benefits

Generally, economic benefits are defined as what a user (e.g., visitor, recreationist, household) would pay to ensure continued access to a particular resource (good/service), or for an enhancement

in the resource (e.g., increased catch of a chosen species). This benefit measure is suitable for assessing society's net gain from an investment to acquire or improve habitat. It is essential to know the additional benefits a user receives to compare costs of the habitat improvement (restoration). Since actual visitor expenditures have already been paid for gas, supplies, accommodation, bait, etc., these dollars cannot be used as a measure of benefit, to do so would result in an inaccurate double counting method.

What is germane to determining whether the benefits of the conservation effort or habitat improvement exceed the costs is, if the effort produces sufficient additional economic benefits that the user would be able and willing to pay for it. For example, if a conservation easement has an annual cost of $1,500, we want to know if the 100 anglers and hunters who use the land would pay an average of $15 each year to fish and hunt there. If yes, the benefits and costs are equivalent and the decision is economically justifiable. It is not possible to use the $25 each might spend on travel to the area as a measure of benefits, since it has been spent on gasoline and other recreation-related travel inputs it is not available to pay for the conservation easement. Only the "consumer surplus", or benefits in excess of the $25 travel costs, is available to pay for the easement.

### 7.4.5 Units of Analysis for Benefit Transfer

To use benefit transfer, a per unit benefit value must be selected from a list of current studies or a table of average values, which is then applied to the proposed policy site or activity for which values are needed. For this study we have elected to use a per acre standard measure. The per unit measure is multiplied by the change in human use (e.g., number of visitors or households) or number of acres associated with management action. In an Environmental Impact Statement (EIS), the per unit benefit value may be multiplied by the human use without the management action and with the management action so that the economic value of each alternative can be compared in monetary terms.

### 7.4.6 Total Economic Value: Passive and Recreation Use Values

Some benefit transfer studies provide estimates of solely on-site recreation use values such as hunting or viewing. Such direct use values often reflect the majority of social benefits for abundant game species, such as deer. Yet, for some rarer species and habitats (e.g., old growth forests, wetlands, free flowing rivers), people who do not hunt, visit these sites, or view these species or visit their habitat may still receive benefits from their protection and conservation. Economists refer to such "off-site" benefits by several names, including passive use values, existence value and non-use value.

To avoid double counting the same benefits using different benefit transfer methods, it was important to carefully consider if the WDFW land acquisitions under study affect only user values (e.g., hunters, viewers, birdwatchers, anglers, etc.), or if there are also significant passive use values to the general population (Hoehn 2006). Similarly, it is important to circumvent piling on passive use value benefits to recreation use values to make benefit estimates larger. The decision to err toward the conservative is documented in our rationale throughout the study.

### 7.4.7 Limitations

Within the limits of the available data and related literature, we provide benefit transfer values and estimate meta-analysis calculations for benefit function transfer. Tabular values for Okanogan County were developed for wildlife recreation use values that include hunting (migratory, small and big game), freshwater angling and viewing. Benefit function transfer meta-analyses calculate total economic values of habitats (e.g., aquatic, wetlands, and terrestrial resources) and species (e.g., threatened and endangered (T&E) species, salmon). We also estimate wildlife recreation use using estimation models applicable to WDFW Wildlife Areas.

### 7.4.8 Benefit Function Transfer

Two types of benefit function transfer exist, benefit/demand function transfer and meta-analysis function transfer. In this study, we use meta-analysis function transfer as this approach includes the use of information from all the available empirical studies, and thus is more complete and broadly relevant for benefit transfer. Realistically a single meta-analysis function can be applied to many more activities and species than is typically possible with a single demand function from related studies. Thus, with the broad applicability of meta-analysis benefit functions this method is most appropriate for assessing values for the array of resources relevant to this study, including recreation; terrestrial; T&E species and habitats; wetlands and aquatic resources. Importantly, economists and agencies have increasingly provided support to meta-analyses as a qualified methodology for benefit transfer (Boyle et al., 1999; U.S. EPA, 2000; Brander and Florax, 2007; Johnston et al., 2005).

### 7.4.9 Data: Literature Reviews and Meta-Analyses

To update tabular values for wetlands, terrestrial and aquatic resources, T&E species, fishing, hunting and miscellaneous passive uses (generally referred to as viewing), we began with Resource Dimensions 2012 database. The Resource Dimensions database was checked for regional appropriateness and completeness by comparing it to the Loomis (2005) U.S. Forest Service database, as it is believed to have the most complete coverage of angling valuation studies, based on Boyle, et al. (1998). To assure values from all recent relevant studies were included, we obtained and crosschecked against the 2011 database containing over 2,700 studies for an Environmental Protection Agency (EPA) project on benefit transfer developed by Dr. Randall Rosenberger at Oregon State University (Rosenberger 2011). The database was reconciled and any new studies acquired were coded and added to the database to assure the most current values for the region.

For the purposes of this study, we limited study values to those in the U.S. or Canada, and most regionally appropriate. If a recently done meta-analysis was available, it was used, as these studies involved primary raw data and typically included rigorous effort. This was the case for recreational angling, wetlands, terrestrial wildlife habitat and aquatic habitat. Meta-analysis regressions are programmed into the models (Appendix A). Variables are set to the means of the raw data that went into the meta-analysis, per guidance from personal communications with several study authors.

## 7. 5 LAND CLASSIFICATION BREAKDOWN FOR STUDY AREA PARCELS

Total acreage of the study area parcels are provided in the data table accompanying the land use layer downloaded from the Okanogan County GIS Division.[83] To estimate the study area parcel acreage categorized as wetland, terrestrial and aquatic resources, parcels and pertinent layers were mapped using GIS layers provided by the Okanogan County GIS Division.

The wetland buffer layer utilized in the build-out scenario from the USFWS NWI was used to estimate the acreage of study area parcels covered by wetland resources. The hydrography layer provided by the Okanogan County GIS Division (i.e. rivers, lakes, streams, etc.) was used to estimate the proportional acreage of study area parcels covered by aquatic resources. The balance of the study area parcel acreage is generally treated as terrestrial.

The two layers were mapped using the GIS interface of the CommunityViz® module to estimate the acreage of wetland resources and aquatic resources on the study area parcels. The total acreage of the study area parcels is 8,504.83 acres. Total acreage of aquatic resources is 66.52 acres; thus 0.78% of the study area parcels are covered by aquatic resources. This does not include study area parcel acreage that is adjacent to, but not covered by aquatic resources (though the parcels could be used to access such aquatic resources). Total acreage of wetland resources is 1,307.4 acres; thus 15.37% of the study area parcels are covered by wetland resources.

Generally, the categories of ecosystem services valued in this study include provisioning, regulating and societal/cultural services. Table 43 identifies the primary services within these categories likely to be provided by wetland, aquatic and terrestrial habitats on the study area parcels. The ecosystem services for each habitat class valued in this assessment are shown.

**Table 43. Services Valued in this Study by Habitat Type**

| | | Provisioning | | Regulating | | | | Societal / Cultural | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Habitats** | **Acres** | Water Supply | Timber | Flood Control | Erosion Control | $CO_2$ Sequestration | Water Quality | Recreation | Aesthetic / Amenity | Tourism | Biodiversity (non-use) |
| Terrestrial | 7,130.91 | ● | | ● | ● | | ● | ● | ● | ● | |
| Wetlands | 1,307.40 | ● | | ● | ● | | ● | ● | ● | ● | |
| Aquatic | 66.52 | ● | | | | | | | ● | | ● |
| **Total Area (Ac)** | 8,504.83 | | | | | | | | | | |

*Source: Resource Dimensions, 2014*

[83] *Okanogan County GIS, Available Digital Data, 'Parcel Coverage'. December 9, 2013 file. http://www.okanogancounty.org/planning/data.htm*

The only provisioning service measured in this study is the supply of fresh water by terrestrial, wetland, and aquatic resources. Three regulating services are assessed, flood control, erosion control and water quality, for terrestrial cover and wetlands. Three societal services are assessed, including recreation, aesthetic amenity value and nature-based tourism.

Table 43 also provides an indication of what is not valued. Due to various constraints and data limitations, regarding biophysical and value data, most ecosystem services cannot be assessed for all study area habitats. In particular, the non-use value of biodiversity (the value people place on the existence and preservation of biodiversity, unrelated to any actual use) is not measured. Thus, as previously acknowledged, the value information presented herein represents only a sub-set of the total economic value of ecosystem services from terrestrial, wetland and aquatic resource lands owned by WDFW.[84] The reader should keep in mind the limited scope of valued ecosystem services when considering the cumulative values presented in the following section.

### Recreation

As mentioned in Section 6, recreation is a major component of the Department's mission. Aligned with this, is the fact that outdoor recreation is a priority for millions—and they have proved it with their wallets. In Washington state alone, recent estimates indicate that outdoor recreationists (anglers, birders, hikers, hunters, wildlife viewers, etc.) contribute somewhere between $4.5 billion to more than $6.7 billion a year (2006 $U.S.) to our state's economy (USFWS 2006). This spending supports about 60,000 related industry jobs (direct and indirect), including many small businesses and rural communities, outfitters, restaurants, gas stations, and sporting goods stores (WDFW 2013).[85]

As is well documented within various Okanogan County documents and plans, the importance of visitors seeking outdoor recreation experiences cannot be underestimated. For example, it is estimated that visitors participating in trail-related recreation contribute $9 million in revenues annually to the Methow Valley economy (Okanogan County Outdoor Recreation Plan, 2012). The 2005 study conducted for the Methow Valley Sport Trails Association (MVSTA) similarly found a total of $8.6 million dollars of direct and indirect expenditures within the Valley's economy annually attributable to the MVSTA trails network and related natural resource-based recreation unique to the Methow Valley. The survey conducted in conjunction with the 2005 study found that 71.6% of resident and 74% of trail user respondents said the trails system was the most important factor to their average visit (Resource Dimensions, 2005). People come to the region specifically to experience recreation opportunities, several of which are due to the unique natural attributes of the county.

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[84] *Similar contributions were not assessed on lands where WDFW holds conservation easements.*
[85] *"WDFW funding supports a strong and diverse outdoor economy" November 06, 2013. http://wdfw.wa.gov/publications/01560/wdfw01560.pdf*

The purpose of the recreation valuation estimates within this section is to address those aspects of recreation-related impacts not addressed within the finite discussion in Section 6, within the parameters of the study. The economic value of outdoor recreation potentially associated with the study area parcels is estimated using a value function following the method previously described in Section 7.4. Generally, recreation estimates included within the value function are hiking, wildlife viewing, fishing, bird watching, and small game, big game and waterfowl hunting. It is acknowledged that this presents a likely underrepresentation of all recreation activities. Yet, use of the more narrowly defined list safeguards against potential double counting, and enables a more accurate value estimate for recreation visits by habitat type.

### Aesthetic / Amenity

The aesthetic or amenity value is related to the passive use benefit (visual enjoyment) that people receive when experiencing nature and the sense of wellbeing that they derive. It is associated with people's appreciation of the natural attributes of an area that contribute to its beauty, aesthetic lucidity, cultural importance, etc.

### Flood Control

Natural ecosystems can play an important role in flood control. Wetlands, for example, in the upper reach of a river basin can act much like a sponge, absorbing rainfall and thereby reducing the speed and volume of runoff entering streams and rivers. Thus, downstream water levels rise more slowly, reducing the potential for destructive flooding. We have conservatively assessed the value of flood control provided by wetlands and terrestrial resources on the study area parcels. Two separate value functions are used for each general habitat type, to estimate a flood control value per acre for each.

In terms of flood control per unit of area, wetlands are generally assessed to provide a more valuable service than other land classifications. Thus, to eliminate potential double counting for this service, it is appropriate to apply the transfer function for the wetland acres.

### Water Supply

The regulation of water for drinking and irrigation is directly or indirectly moderated by the diverse roles played by different ecosystems. The valuation of the role of ecosystems, found on study area parcels, in the supply of water is determined using the same value functions used in the assessment of flood control.

### Water Quality

Healthy, well-functioning ecosystems can play a vital role in purifying water through pollutant capture provided by vegetation, soils and sediments. High levels of nutrients like phosphorus, associated with agricultural runoff and sewage effluent, for example, can be considerably reduced by wetlands. The direct economic contribution to the County is in the reduction of costs associated with processing the water when it enters the municipal water supply.

The valuation of the water quality service uses the same transfer functions used in the assessment of flood control and water supply provided by ecosystems. The value functions determined by the model are used to estimate water quality values per acre for wetlands and terrestrial resources that are multiplied by the area of each habitat.

### Habitat

Lands owned by WDFW or otherwise protected through conservation easements in the Okanogan-Similkameen and Methow landscape conservation focus areas are vital for conserving regional biodiversity and support many species. Maintaining habitat corridors in the region is important to recovery efforts for T&E species. Habitats identified for priority conservation are found within several planning documents, such as the Okanogan Ecoregional Assessment (2006), Okanogan-Similkameen Corridor Conservation Project (2007), and the Okanogan Subbasin Plan (2004)[86]. Study area parcels protect just over 8,500 acres of wildlife habitat. Department acquisitions have focused on property on or near rivers that are part of a much larger corridor of ecologically viable fish and wildlife movement between the shrub-steppe region of the Columbia Basin and like habitats in British Columbia.

The County's wildlife population includes several species designated by the Department as priority species—those that *"require protective measures for their survival due to their population status, sensitivity to habitat alteration, and/or recreational, commercial, or tribal importance. Priority species include State Endangered, Threatened, Sensitive, and Candidate species; animal aggregations considered vulnerable; and species of recreational, commercial, or tribal importance that are vulnerable."* [87]

## 7.6 SUMMARY OF FINDINGS

To provide an overview of the total and relative values of the ecosystem services that are assessed in this study, Table 44 presents a summary of the values estimated. The total annual value of the *assessed* ecosystem services for the limited subset of study area parcels is about $65.23 million.

In considering the location and access to the study area parcels included in this analysis and how these attributes would impact the various aspects of potential use, we adjusted specific modifiers within the models to remove potential double counting errors and most closely approximate uses by

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[86] *Okanogan Ecoregional Assessment, 2006. Nature Conservancy of Canada, The Nature Conservancy of Washington and the Washington Department of Fish and Wildlife. http://www.natureconservancy.ca/en/what-we-do/resource-centre/conservation-blueprints/#okanagan; Okanogan-Similkameen Corridor Conservation Project, 2007. http://www.wildliferecreation.org/our-campaigns/wwrp-projects/projects/Okanogan_Similkameen_Corridor Okanogan Subbasin Management Plan, Northwest Power and Conservation Council, November 2004. http://www.nwcouncil.org/fw/subbasinplanning/okanogan/plan*

[87] *WDFW, Priority Habitats and Species (PHS), Priority Habitats and Species List. http://wdfw.wa.gov/conservation/phs/list/*

outdoor recreationists. Table 44 reflects the estimated total economic value of the contributions provided to Okanogan County, and beyond, by the 8,504 acres (3,441.8 ha) of study area parcels that comprise a component of the Department's conservation land holdings within the county. Each of the subsequent subsections presents greater insight into the parameters assessed at the macro level for each habitat type.

**Table 44. Summary of Economic Contributions provided by Study Area Parcels (2013 $U.S. Dollars)**

| Resource Type | Acres | Total/Unit $ Contribution | Unit of Measure | Annual Economic Contribution |
|---|---|---|---|---|
| Wetlands | 1,307.40 | $ 2,802 | per acre | $ 3,663,700 |
| Terrestrial Lands | 7,130.91 | $ 8,593 | per acre | $ 61,275,910 |
| Acquatic (lakes, rivers, streams)* | 66.52 | $ 98 | per household | $ 290,157 |
| Total | 8,504.83 | | | $ 65,229,767 |

*Source: Resource Dimensions, 2014*

### 7.6.1 Wetlands

The annual values for the role of wetlands in providing the identified ecosystem services are presented in Table 45. The outputs reflected provide a comprehensive estimate of the total conservation value for study area parcels. Combined, the opportunities provided by protected WDFW lands for various outdoor/nature-based recreation activities have the highest total per acre value ($815/acre), followed by flood control ($660/acre), water quality ($437/acre), habitat ($377/acre) and erosion control ($330/acre). Values for aesthetic enjoyment of the landscape and water supply are relatively low but not economically insignificant. The total annual value of the associated services is estimated to be about $3.66 million.

**Table 45. Total Economic Value of Wetland Ecosystem Services for Study Area Parcels (2013 $U.S. Dollars)**

| Ecosystem Services | Value / Acre |
|---|---|
| Flood Control | $660 |
| Water Quality | $437 |
| Water Supply | $179 |
| Recreation | $815 |
| Amenity | $5 |
| Habitat | $377 |
| Erosion Control (Storm) | $330 |
| **Total $/acre all ES services** | **$2,802** |
| **Average $/acre value for ES services** | **$400** |
| **Estimated wetland acres** | **1307.40** |
| **Total annual economic contribution provided by WDFW study area wetlands** | **$3,663,700** |

*Source: Resource Dimensions, 2014*

### 7.6.2 Terrestrial Resources

The resources that serve the estimated 7,131 terrestrial acres of study area parcels provide wildlife viewing, open space, habitat and regulating ecosystem services. The annual values for the role of these lands in providing the identified ecosystem services are presented in Table 46. The total annual value of the associated services is estimated to be about $61.3 million.

Together, the opportunities provided by protected WDFW lands for various outdoor/nature-based recreation activities have the highest total per acre value ($2,546/acre). As with wetland services, flood control is second highest per acre value ($2,036/acre), followed by water quality ($1,339/acre), habitat ($962/acre) and erosion control ($943).

**Table 46. Total Economic Value of Terrestrial Habitat for Study Area Parcels (2013 $U.S. Dollars)**

| Ecosystem Services | Value / Acre |
|---|---|
| Flood Control | $2,036 |
| Water Quality | $1,339 |
| Water Supply | $595 |
| Recreation | $2,546 |
| Amenity | $172 |
| Habitat | $962 |
| Erosion Control (Storm) | $943 |
| **Total $/acre all ES services** | **$8,593** |
| **Average $/acre value all ES services** | **$1,228** |
| **Estimated terrestrial acres** | **7130.91** |
| **Total annual $ value of terrestrial habitat for WDFW study area** | **$61,275,910** |

*Source: Resource Dimensions, 2014*

### 7.6.3 Aquatic Resources

As with the terrestrial and wetland value models, the aquatic model estimates the value of the ecosystem services supplied by these lands. Similarly, these services represent free inputs into the county's production as there are no associated input costs. Worth noting here, the aquatic model is based solely on the results of contingent valuation studies, while the other valuation models are based on a broader spectrum of approaches used in other studies. This is purely a function of applicable primary studies and does not affect the viability of the estimates, though does limit a more precise breakdown by ecosystem service type. For the purposes of this study, the aggregate, shown in Table 47, is sufficient to provide an understanding of the net benefits generated by the aquatic resources on the study area parcels. Additionally, it should be noted that the aquatic model is based upon passive use and therefore does not include values for things like recreational angling, which are captured within the prior estimates.

**Table 47. Total Economic Value of Passive Use Aquatic Resources, for Study Area Parcels (2013 $U.S. Dollars)**

| Ecosystem Services | Value / Acre |
|---|---|
| Estimated aquatic area | 66.52 |
| Annual $ value/HH of aquatic nonuse values | $97.93 |
| Number of households (study area estimate) | 2963 |
| Total annual nonuse $ value provided by waters within WDFW study area | $290,157 |

*Source: Resource Dimensions, 2014*

## 7.7 CONCLUSIONS

The annual values of seven important ecosystem services have been assessed for the study area parcels using available data and value transfer methods. The models Together and conservatively, the average annual value of these services represent is just over $65 million.

While these values highlight the economic importance of ecosystem services, they are not in themselves readily useful for evaluating alternative policies related to management of the natural environment. This is not to say that it could not be done. However, this requires a marginal analysis, which is outside the scope of this study. To accomplish this, we would need to know how the current provision and value of ecosystem services would change under alternative policy scenarios.

We reiterate here that this assessment includes values for only a subset of ecosystem services produced by natural capital on the study area parcels. Table 43 provides a synopsis of where the gaps lie. Future work should target filling those gaps of greatest importance. For example, the non-use value of biodiversity—the value that people place on the existence and conservation of biodiversity, is unrelated to any actual use. It is associated with people's preference or desire to maintain biodiversity for its own sake and as a bequest to the future. Previous studies that have estimated the non-use values for biodiversity reveal that it is a large component of total economic value.

# SECTION 8: ASSESSING FUTURE ACQUISITIONS

## 8.1 INTRODUCTION

This section describes the *Parcel Acquisition Assessment System*, developed for use by WDFW in assessing the level of fiscal and economic impact to Okanogan County of future land acquisitions. This tool is designed to assess one parcel at a time. Thus, assuring that consideration of the fiscal and economic impacts occur during the evaluation of an individual parcel.

The *Parcel Acquisition Assessment System,* comprising three spreadsheet layers together with working tables for use in estimating ecosystem service values, is contained within one Excel® spreadsheet. The first layer contains the 'Instructions', which provides the user with guidance for scoring the favorability, to the County, of fiscal and economic impacts of parcel acquisition. Eight categories of fiscal and economic impacts are considered. Each category contains one or more attributes. Attributes of each category may be 'favorably' or 'unfavorably' affected as a result of parcel acquisition by WDFW. Each attribute within the category must be considered prior to assigning the category a score.

In the second spreadsheet layer entitled 'Parcel Acquisition Categories', categories are assigned a score of 1 to 5 based on how favorable or unfavorable the outcome is to the County. A score of 5 represents a more favorable outcome to the County. A score of 4 represents a somewhat more favorable outcome to the County. A score of 3 represents a neutral to moderately favorable, effect to the County. A score of 2 represents a somewhat less favorable effect to the County. A score of 1 represents a less favorable effect to the County.

Scores for each category are linked to a cell on the 'Total Score' spreadsheet layer, where the scores for the eight categories are tallied. The total score can then be compared to the key provided within the spreadsheet. This key presents score ranges that can be used to gauge how acquisition of the parcel by WDFW may affect the County fiscally and economically.

## 8.2 PARCEL ACQUISITION ASSESSMENT SYSTEM CATEGORIES

### 8.2.1 Potential New Dwelling Units

In the case that the parcel is not acquired by WDFW, but instead was developed for residential homes, the tax base of the County will be affected. To understand what those impacts may be, the potential for residential development on the parcel should be explored using the methodology of Section 3. Steps within the 'Parcel Acquisition Categories' worksheet assist the evaluator(s) in this process.

A customized build-out scenario can be constructed for the parcel being considered for acquisition, and a numeric build-out analysis and a spatial build-out analysis can be used to calculate the number of dwelling units that may potentially be placed on the parcel.

### 8.2.2 PILT versus Hypothetical Tax Assessed

One method of assessing potential return from the parcel is to investigate the ratio of PILT assessed on the parcel versus the hypothetical tax that can be assessed on potential residential development on the parcel. The steps within the category assist the evaluator(s) in progressing through the methodology explained in Section 2 to calculate PILT and the methodology explained in Section 4, to calculate the hypothetical tax that could be assessed. Hypothetical tax assessed is rooted in the results of Category I. *Potential New Dwelling Units*.

### 8.2.3 Cost per Household to Provide Services

The steps of this category are also rooted in the results of Category I. *Potential New Dwelling Units*. Adding residential households to the County tax base fiscally affects the County. This category assists the evaluator(s) in progressing through the method explained in Section 4. The evaluator(s) will calculate how total cost to provide services changes as a result of adding new residential homes to the taxing districts of the TCA where the parcel resides, and how CPH to provides these services changes.

### 8.2.4 Ecosystem Service Values

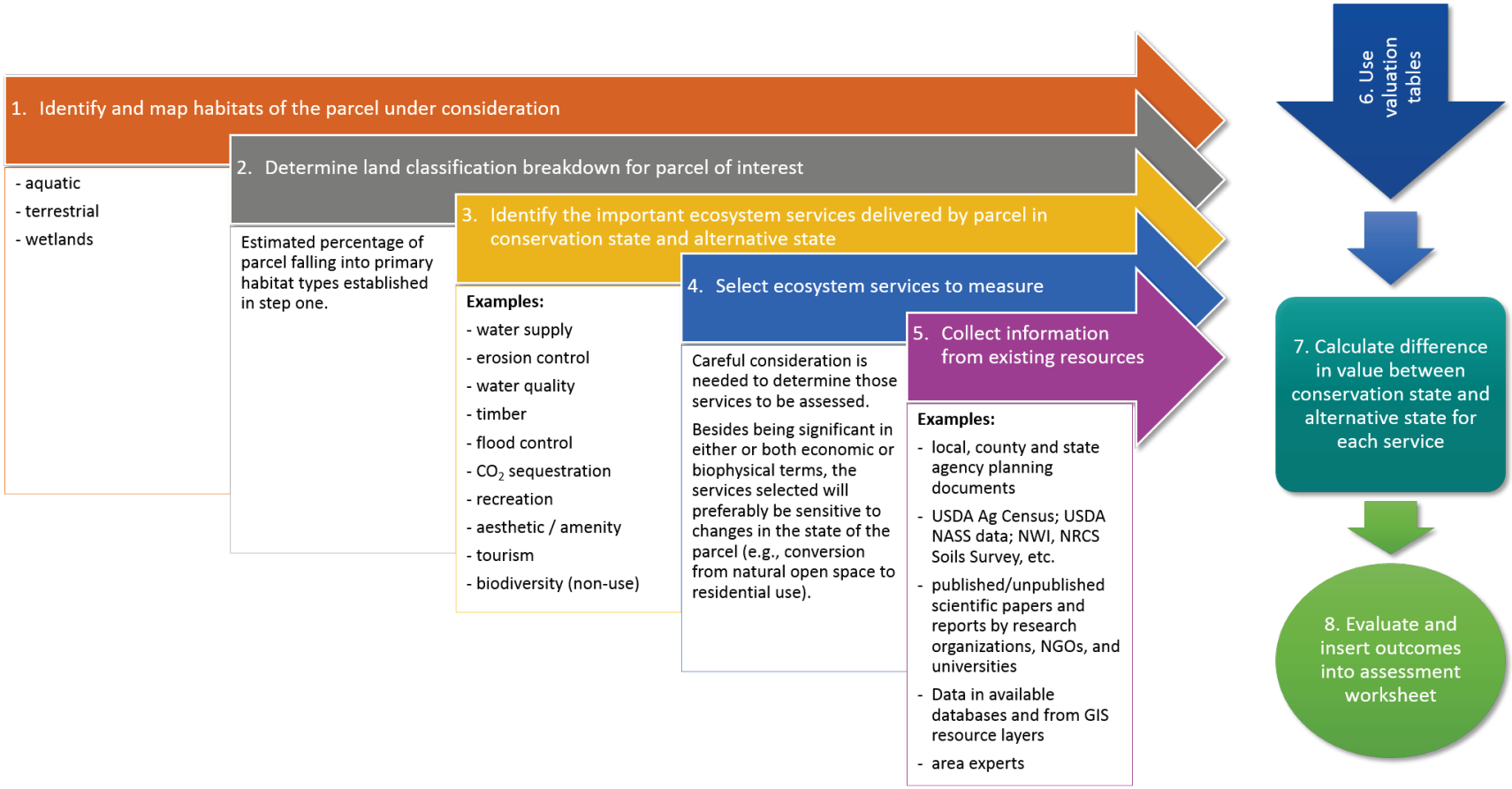
Within the parcel acquisition evaluation process, it is important to know the difference between the amount of the ecosystem service(s) provided by a site in its current state compared to a plausible alternative state, where the habitat is converted (e.g. to housing, commercial development, etc.) or in which natural resources are unsustainably exploited. Decisions pertaining to parcel acquisition by WDFW must appropriately consider whether the conservation of a particular parcel delivers greater benefits than its potential conversion to other land uses. Information on ecosystem services will provide decision-makers important supporting information relevant to acquisition.

The ecosystem services valuation component of the *Parcel Acquisition Assessment System* provides a protocol that leads the user through a series of step-wise information collection, assessment and valuation that connect to other categories of the system while providing new information about selected ecosystem services. Values are determined for the conserved state and the likely alternative state; they may be biophysical and/or economic. Values are then set into a comparative frame to assess who would gain and who would lose if a parcel were acquired for conservation purposes.

Until recently, inclusion of ecosystem goods and service values has been little used in decision-support processes because they are technically difficult and expensive to measure. This assessment process offers practical guidance on how to measure key ecosystem services at the parcel scale.

Steps in evaluation of the ecosystem services valuation simulate those conducted in this study (see Section 7) as shown in Figure 9.

**Figure 9. Steps in ecosystem service values assessment**




*Source: Resource Dimensions, 2014*

### 8.2.5 Current Use of Parcel

The parcel under consideration for acquisition may have a current land use tied to a specific industry, such as farming, ranching, timber production or mining. If the parcel is acquired by WDFW the land use on the parcel may change. Such a change may be beneficial, detrimental, or have no effect on the specific industry within the County that the land use activity corresponds with.

This category asks the evaluator to consider potential changes to specific County industries resulting from a possible change in land use activity. Publicly available data can be used to understand the size of the industry within the County, such as that available through the USDA Census of Agriculture, the U.S. Department of Labor, etc.

### 8.2.6 Land Use Planning

Within the land use planning module the evaluator examines the parcel under consideration in the context of current land use patterns, regulations and comprehensive plans. As in other categories, the parcel is assessed in its current state and plausible alternative state. Evaluation criteria include:

- current zoning
- land quality
- parcel size and primary conservation purpose
- availability of public services
- proximity to other conservation lands
- water resource availability (e.g., water rights, existing well, other)
- intensity of surrounding land uses; history of land development nearby
- relationship or proximity to growth areas
- likelihood of conversion to plausible alternative state

Using these criteria as the lens, the evaluator(s) draws upon existing publically available data to assess parcel location, access, quality, and resource attributes in the context of existing and potential drivers of change to the parcel today and for the next 10 years.

### 8.2.7 Water Rights

The steps within this category assist the evaluator(s) in progressing through the method explained in Section 5. The process begins with identifying if the parcel has a water rights record. If the parcel does have water rights, the evaluator(s) will assess if the water right may be used for residential development or agricultural production.

### 8.2.8 Economic Contribution of Parcel if WDFW Acquired

Economic contributions to the County can result from continued uses of the parcel under consideration for agriculture (i.e. crop leases and grazing permits), restoration projects conducted on the parcel, and public recreation. Applying the method used in Section 6, the evaluator(s) will roughly estimate the economic impact due to activities conducted on the parcel under WDFW

ownership. For example, some estimates can be gleaned by extrapolating from the units of Wildlife Area where the parcel resides.

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# APPENDICES

## APPENDIX A MODEL VARIABLES DEFINITIONS AND STATISTICS

## A1. Wetland Model Variable Definitions

| Variable | Definition |
|---|---|
| $ / acre | Annual $ value of an acre of wetlands, converted to 2013 base year. |
| Acres | Size of the wetland in acres (this is log of this variable and is programmed into model). |
| Amenity | Amenity values provided by proximity to or resulting from the overall environment. |
| Birdwatching | Recreational observation of wildlife resulting from a habitat for bird species. |
| CS | Consumer Surplus |
| CVM | Contingent Valuation Method |
| Data0 | Dummy variable set at 1 if the data used in the study was determined to be highly questionable. |
| Erosion Control | Erosion reduction resulting from stabilization of sediment. |
| FloodControl | Reduced damage due to flooding & severe storms resulting from flood control and buffering. |
| GameBirdHunt | Recreational hunting resulting from a habitat for bird species. Also, production of food and fiber for harvest resulting from biomass production and export. |
| Habitat | Nonuse appreciation of species resulting from provision of habitat for all species. |
| HPM | Hedonic pricing method. |
| Intercept | Constant |
| Metric | Dummy variable set at 1 if the econometrics used in the study deemed highly questionable. |
| NFI | Net factor income method. |
| PS | Whether the value was an estimate of producer's surplus. |
| Publish | If/whether results had been published. |
| Quality (Water) | Reduced costs of water purification resulting from water quality control and/or retention, transformation or removal of nutrients. |
| RCM | Replacement cost method. |
| RecFish | Recreational fishery improvements (on or offsite) resulting from habitat for aquatic species. |
| Supply (Water) | Increased water quantity resulting from recharge of ground water. |
| TCM | Travel cost method. |
| Theory0 | Dummy variable set at 1 if the theory used in the study was deemed highly questionable. |
| Total Revenue | Valuation using Total Revenue (Price times Quantity) |
| Year | Date of the study (1960=0). |

## A2. Terrestrial Habitat Model Variable Definitions

| Variable | Definition |
|---|---|
| $ / Acre | Annual $ value of an acre of terrestrial habitat, converted to 2013 base year. For a description of value, see Definition of Benefits tab. |
| Acre | Habitat acres (note: this is log of this variable and is programmed into model). |
| CVM | Coded as 1 if study used Contingent Valuation Method, 0 if not. |
| OS | Open space, coded as 1 if open provided by the site, 0 if not. |
| OSHABMulti | Open space + habitat for multiple species, coded as 1 if both services provided by the policy site, 0 if not. |
| Publish | 1 if study is a journal article, 0 if not. |
| WildView | 1 if wildlife viewing is allowed/provided by the policy site, 0 if not. |
| Year | Date study was conducted (1982=1) |

## A3. Aquatic Model Variable Definitions

| Variable | Definition |
|---|---|
| #_riv_pond | # of rivers or salt ponds affected by policy/project: multiple_river or salt_pond = 1. Specified as the sum of the multiplicative interactions between multiple_river and # of water bodies and that of salt_pond and the # of water bodies. |
| $ value per household | Annual nonuse value per household; converted to 2013 base year. |
| 1_lake | Binary variable; resource change explicitly takes place over a single lake. |
| 1_river | Binary variable; resource change explicitly takes place over a single river (default is a change in an estuary). |
| baseline | Baseline water quality, per RFF water quality ladder. 0 = no uses. 2.5 = boatable; 5 = fishable & boatable; 7 = swimmable, fishable and boatable. |
| bid_outlier | Binary variable; indicates that outlier bids were excluded when estimating WTP. |
| DC | Binary variable indicates that WTP was estimated using a discrete choice survey. |
| fish+ | Binary variable identifying studies in which a fish population or harvest change of 50% or greater is reported in the survey. |
| hi_response | Binary variable indicates survey response rate exceeds 74% (I.e., 75% or above). |
| income | Mean income of respondents, either as reported by the original survey or calculated using U.S. Census averages for the original surveyed region. |
| interview | Binary variable indicates survey was conducted through in-person interviews. |
| lump_sum | Binary variable indicates that payments were to occur on something other than a long-term annual basis (e.g., a single lump sum payment). |
| mail | Binary variable; survey was conducted through the mail. |
| median_WTP | Binary variable; indicates study reported median, not mean, WTP. |
| mult_reg | Binary variable; survey included respondents from more than one of the regions. |
| multiple_river | Binary variable; resource change explicitly takes place over multiple rivers. |
| nonfish_uses | Binary variable identifies studies where changes in uses other than fishing are specifically noted in the survey. |
| nonparam | Binary variable; WTP was estimated using nonparametric methods. |
| nonusers | Binary variable; survey is implemented over a population of nonusers (default category is a survey of any population that includes users). |
| pacif_mount | Binary variable; survey was conducted in the USDA Pacific/Mountain region (AK, AZ, CA, CO, HI, ID, MT, NM, NV, OR, UT, WA) |
| protest_bids | Binary variable; protest bids were excluded when estimating WTP. |
| regional_fresh | Binary variable; resource change explicitly takes place in a fresh waterbody. |

| Variable | Definition |
|---|---|
| voluntary | Binary variable; indicates that WTP was estimated using a payment vehicle described as voluntary. |
| wq_change | Change in mean water quality, per RFF water quality ladder. Defined as the difference between baseline and post-improvement quality. Variable only included in model as part of an interaction. |
| WQ_fish | Interaction variable: wq_change X by a binary variable identifying studies where water quality improvements are stated to benefit only fin fish. (default=0, water quality did not affect fish). |
| wq_ladder | Binary variable indicates original survey reported resource changes using standard RFF water quality ladder. |
| WQ_many | Interaction variable: wq_change X by a binary variable identifying studies where water quality improvements are stated to benefit multiple species types. (default =0, water quality did not affect multiple species). |
| WQ_non | Interaction variable: wq_change X by a binary variable identifying studies where species benefiting from water quality improvements remain unspecified. (default=0, water quality did not affect unspecified species). |
| WQ_shell | Interaction variable: wq_change X by a binary variable identifying studies where water quality improvements are stated to benefit only shellfish. (default=0, water quality did not affect shellfish). |
| year_indx | Year study was conducted; converted to an index by subtracting 1970. |

## A4. Wetland Model Statistics

| Variable | Mean | Coefficient | Std. Error | Product of Mean & Coefficient |
|---|---|---|---|---|
| Amenity | 0.15 | -4.30 | 0.95 | -0.663 |
| Birdwatch | 0.28 | 1.80 | 0.59 | 0.500 |
| Coastal | 0.43 | -0.12 | 0.68 | -0.050 |
| ComFish | 0.27 | 1.36 | 1.01 | 0.363 |
| Data0 | 0.25 | 0.00 | 0.60 | 0.000 |
| Erosion Control | 0.03 | 0.17 | 1.66 | 0.005 |
| FloodControl | 0.14 | 0.68 | 0.77 | 0.092 |
| GameBirdHunt | 0.40 | -1.06 | 0.52 | -0.422 |
| Habitat | 0.31 | 0.43 | 0.59 | 0.132 |
| HP | 0.03 | 5.04 | 1.12 | 0.156 |
| Intercept | 1.00 | 7.87 | 1.74 | 7.872 |
| Ln Acres | 9.28 | -0.29 | 0.11 | -2.654 |
| Metric0 | 0.12 | -3.19 | 1.22 | -0.392 |
| NFI | 0.25 | 0.27 | 0.90 | 0.067 |
| PS | 0.28 | -3.14 | 0.86 | -0.870 |
| Publish | 0.79 | -0.15 | 0.71 | -0.121 |
| Quality | 0.20 | 0.74 | 0.75 | 0.147 |
| RCM | 0.28 | 2.23 | 0.58 | 0.618 |
| RecFish | 0.36 | 0.58 | 0.56 | 0.209 |
| Supply | 0.06 | -0.33 | 1.54 | -0.021 |
| TCM | 0.11 | -0.34 | 1.05 | -0.037 |
| Theory0 | 0.22 | -1.05 | 0.84 | -0.225 |
| Year | 17.90 | 0.02 | 0.04 | 0.286 |
| | | | **Total** | 4.994 |
| $/acre (2013 base year) | | | | $262.86 |

## A5. Terrestrial Model Statistics

| Variable | Mean | Coefficient | Std. Error | Product of Mean & Coefficient |
|---|---|---|---|---|
| Constant | 1.00 | -10.37 | 6.24 | -10.37 |
| Year | 9.89 | 0.47 | 0.19 | 4.60 |
| LnAcre | 0.00 | 0.34 | 0.37 | 0.00 |
| CVM | 0.91 | 1.51 | 2.21 | 1.38 |
| Public | 0.87 | -0.27 | 2.09 | -0.24 |
| WildView | 0.61 | 6.15 | 1.05 | 3.75 |
| OS | 0.26 | 5.33 | 2.07 | 1.39 |
| OSHABMulti | 0.39 | 2.01 | 1.56 | 0.79 |
| **Ln $/acre** | | | **Total** | 1.296 |
| **$/acre (2013 adjusted base year)** | | | | $4.63 |

## A6. Aquatic Habitat Model Statistics

| Variable | Mean | Coefficient | Std. Error | Product of Mean & Coefficient |
|---|---|---|---|---|
| baseline | 4.60 | -0.12 | 0.04 | -0.57 |
| DC | 0.35 | 0.37 | 0.33 | 0.13 |
| fish+ | 0.12 | 0.80 | 0.17 | 0.10 |
| hi_response | 0.31 | -0.80 | 0.12 | -0.25 |
| income | 43644.10 | 0.00 | 0.00 | 0.02 |
| intercept | 1.00 | 6.00 | 0.61 | 6.00 |
| interview | 0.19 | 1.30 | 0.17 | 0.25 |
| lump_sum | 0.00 | 0.62 | 0.17 | 0.00 |
| mail | 0.56 | 0.56 | 0.18 | 0.32 |
| median_WTP | 0.06 | 0.22 | 0.16 | 0.01 |
| mult_reg | 0.04 | 0.61 | 0.25 | 0.02 |
| multi_river | 0.09 | -1.62 | 0.30 | -0.15 |
| nonfishuse | 0.73 | -0.15 | 0.12 | -0.11 |
| nonparam | 0.46 | -0.47 | 0.18 | -0.21 |
| nonusers | 0.19 | -0.50 | 0.12 | -0.10 |
| #_riv_pond | 1.40 | 0.08 | 0.01 | 0.11 |
| bid_outlier | 0.22 | -0.88 | 0.11 | -0.19 |
| pacif_mount | 0.18 | -0.31 | 0.13 | -0.06 |
| protest_bids | 0.46 | 0.94 | 0.13 | 0.43 |
| regional_fresh | 0.16 | -0.01 | 0.16 | 0.00 |
| salt_pond | 0.05 | 0.76 | 0.34 | 0.04 |
| 1_lake | 0.12 | 0.30 | 0.26 | 0.04 |
| 1_river | 0.24 | -0.32 | 0.18 | -0.08 |
| voluntary | 0.07 | -1.64 | 0.23 | -0.11 |
| wq_change | 2.42 | 0.00 | | 0.00 |
| WQ_fish | 1.15 | 0.21 | 0.08 | 0.24 |
| wq_ladder | 0.32 | -0.36 | 0.18 | -0.12 |
| WQ_many | 0.63 | 0.24 | 0.10 | 0.15 |
| WQ_non | 0.52 | 0.48 | 0.19 | 0.25 |
| WQ_shell | 0.12 | 0.26 | 0.09 | 0.03 |
| year_indx | 18.79 | -0.11 | 0.02 | -1.99 |
| **Ln $/nonuse value per household** | | | | 4.203 |
| **$/ nonuse value per household (2013 base year)** | | | | $86.67 |