APPENDIX - COASTAL COMMUNITIES

The Oregon coast's nearshore marine ecosystems provide social, economic and cultural value to people. Human communities are an influential part of these coastal ecosystems, which are increasingly recognized as social-ecological systems. The coastal environment, including natural resources and physical geography, influences where people live, work and recreate, which, in turn, affects local and regional economies as well as cultures. Management decisions about consumptive (e.g., fishing, mining) and non-consumptive (e.g., tourism, shipping) uses of the environment impact ecological structure and function as well as the human communities who depend on them. Ecological understanding, public awareness, and engagement of diverse constituencies can drive policy and other efforts to improve stewardship of these dynamic marine ecosystems. Select demographic and economic information about the Oregon coast presented here highlights changing relationships between nearshore natural resources and coastal communities. This information can help inform managers and others developing and implementing nearshore management policies and actions.

COASTAL OREGON HISTORY

Underwater shell middens dated to 8,500 years before present provide evidence of human inhabitation of what is now, with higher sea levels, Oregon's nearshore marine habitat. Indigenous people living in this region developed fisheries and other resource management strategies that enabled the persistence of abundant salmon, shellfish and other food and fiber sources for millennia. Prior to European contact, Native Americans fished, hunted, tended perennial plants, gathered, and traded for sustenance. They relied on sand spits, saltwater bays, forests, tidal and intertidal estuaries, lake shorelines, river mouths and their ocean confluences for their ways of life. In addition to shell middens, archeological evidence of subsistence activities along the Oregon coastline includes fishing weirs, food processing sites, villages, and seasonal occupation camps. The diets of the Indigenous people primarily consisted of salmon and a variety of other fish species, shellfish, plants, and mammals. Pacific Northwest Native cultures were renowned for their maritime lifestyles, elaborate technologies, high population densities, sophisticated art and architectural traditions, and sociopolitical complexity.

People native to Oregon's coast first interacted with European explorers who sailed to the Pacific Northwest. Native Americans traded with the Europeans, which helped establish the fur trade. Sea otter pelts became primarily trade items rather than a source of clothing for Indigenous people. The fur trade that extirpated sea otters from the Oregon coast more than a hundred years ago was international. This trade linked the west coast of North America to China where the furs were traded for tea, porcelain, spices and other items imported to America and Europe. International trade also drove commercial whaling, which resulted in dramatic declines of North Pacific Gray whales from the mid-1800s to 1967. North Pacific gray whales, which have recovered to their historic abundance, feed in kelp beds along the Oregon Coast, attracting tourists and providing nutrients in their excretions.

Coastal Oregon is geographically separated from the rest of the state by a low-lying mountain range that parallels the coastline. This geography shaped Indigenous and early European settlement patterns. Coastal permanent Indigenous villages were largely isolated from each other with trails and canoe travel enabling trade networks. Beginning in the mid-1800s, white settlers homesteaded along the rivers and bottomlands where subsistence agriculture was possible. These European settlers tended gardens and livestock while also relying on many of the same resources as the Native Americans: wild berries, deer, elk, and estuarine animals such as clams, crab, and fish. Building shelter, often in the form of log cabins, was the settlers' priority on new land claims. As these early families became more settled, larger houses and outbuildings were constructed. While local towns played important roles in trade and commerce, most early residents continued to live in rural areas. Many early towns along the Oregon Coast had brief periods of prosperity, largely based on unsustainable logging and canneries, before disappearing.

In the modern era, marine resource harvest has increased as human demand for food and recreation has grown, with harvest efforts expanding from estuary and shorelines to include nearshore and more distant waters. Wild salmon populations and some shellfish production have been supplemented with hatcheries and aquaculture operations.

GENERAL COASTAL OREGON POPULATION DATA

Most coastal residents still live near the coastline or in narrow coastal river valleys. A large proportion of the land in coastal Oregon is owned by the Federal government, the state, forest products companies, and other tribal or government entities (Figure 1). Based on the total amount of land in the region, the Oregon coast is sparsely inhabited. The eastern boundaries of five counties (Clatsop, Tillamook, Lincoln, Coos and Curry) approximate the range crest, while Lane and Douglas counties extend farther east to interior valleys. In 2024, the aggregate density of the five coastal counties (excluding coastal Lane and coastal Douglas counties) was 33.8 people per square mile as compared to the state-wide population density of 44.1.

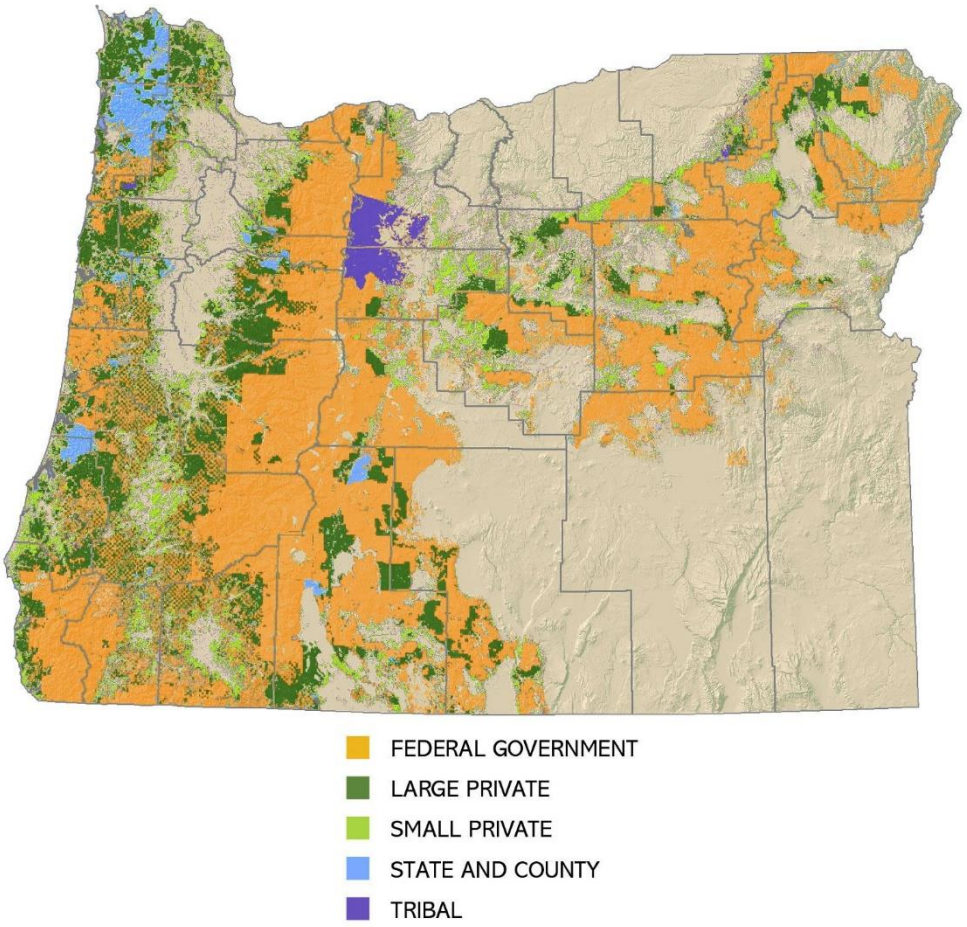

Figure 1. Land ownership in Oregon (Source: Oregon Forests Resource Institute, 2023).

While the coastal population density is low, the density within available private land suitable for residential development is higher than these figures suggest. Timberlands are 94% of the land base. This situation has important implications which will be subsequently discussed. State population density has approximately doubled since 1960. Overall, the coastal population has slowly and steadily increased since the 1950s (Figure 2).

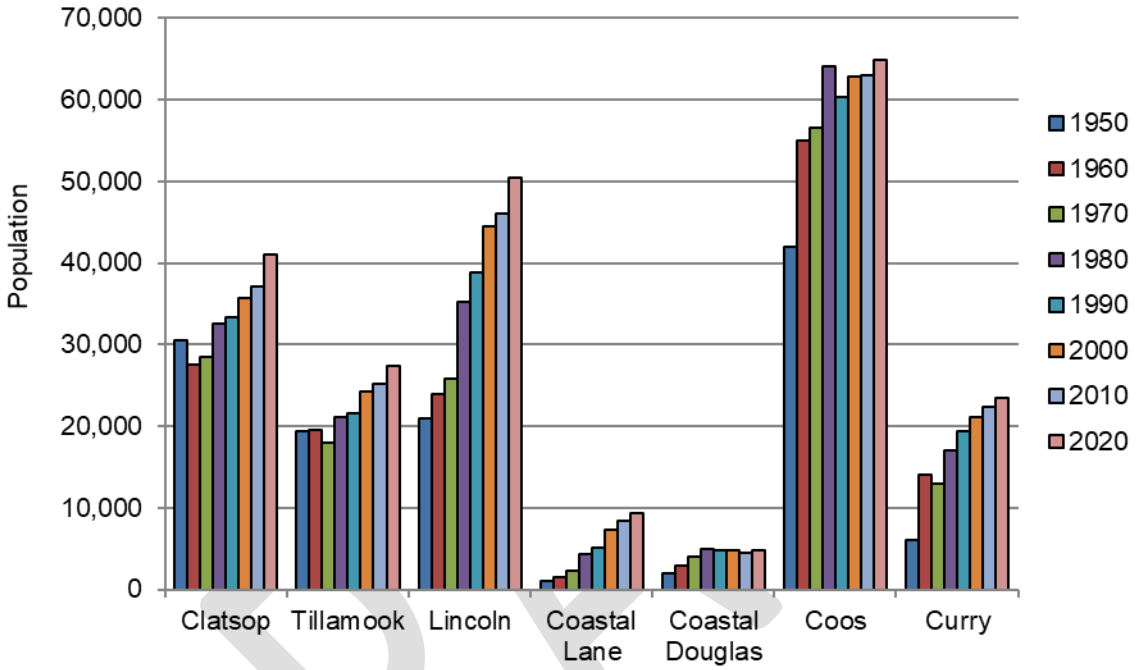

Figure 2. Populations of Coastal Counties from 1950 to 2020. Note that coastal Lane and coastal Douglas counties are approximated by the cities of Florence and Reedsport/Winchester Bay, respectively (Source: 2020 U.S. Census).

The population of coastal Oregon has grown (Figure 2, but more slowly than the state of Oregon as a whole. In 2000, the population of the five coastal counties was 185,460 people—about 5.4% of Oregon's total population. In 2010, the population was 193,730 in the five coastal counties, which was 5.1% of Oregon's total population. In 2024, the five coastal counties comprised 4.9% (206,848) of the state's total population (4,233,358).

A large and growing proportion of coastal residents are retirement aged, >65 years old (

Figure 3). The proportion of retirement-aged coastal residents has been increasing relative to the rest of the state. The proportion of retirement aged people residing at the Oregon coast increased to 30.7% in 2020 as compared to 22.0% in 2010, while the proportion of retirement aged people statewide increased from 13.0% in 2010 to 25% in 2020. The growth rate for the Oregon coast, albeit slower than the rest of Oregon, has mostly occurred due to in-migration of both working age adults and retirees, though the retiree

population has grown more than other age groups. Lincoln, Curry and coastal Lane counties have experienced a higher influx of retirees than the other coastal counties. Relative to the state as a whole, the coast's population has disproportionately more people older than 50, and disproportionately fewer younger individuals. Census data shows that young adults are moving out of coastal counties, likely for education and employment opportunities. Population growth due to births within the coastal region has declined. The slower rate of growth, age structure and in-migration pattern influences the workforce and the coast's economy.

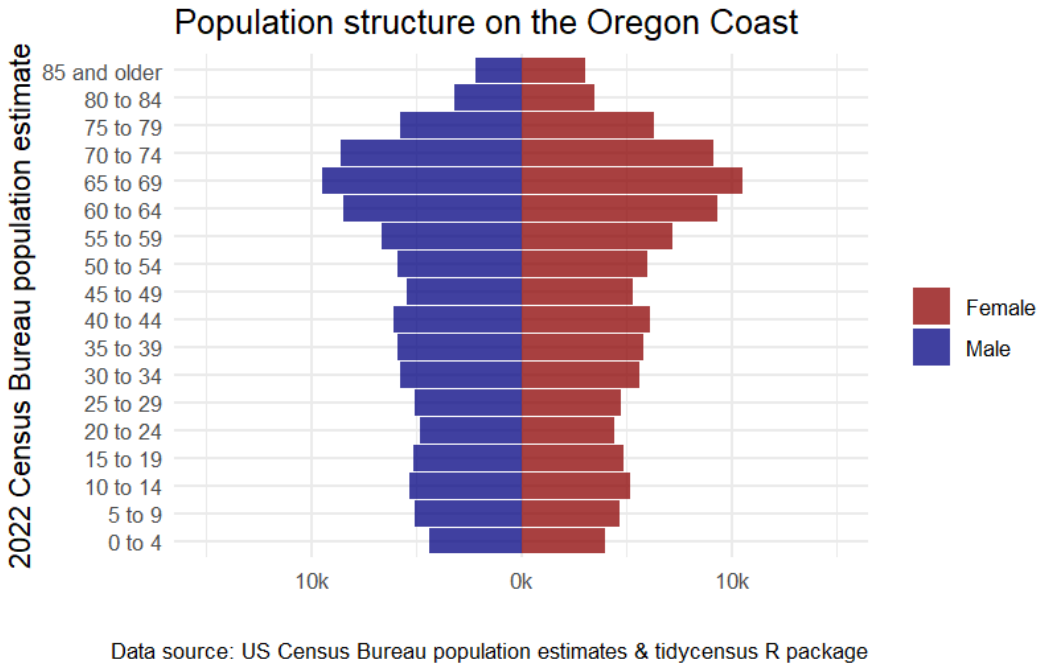

Figure 3. Population structure on the Oregon Coast in 2022 (Source: 2022 American Community Survey).

COASTAL OREGON ECONOMIC CHARACTERISTICS

After European colonization, Oregon's coastal economies were primarily based on fishing, farming and logging. Since the 1990s, opportunities in natural resource industries have largely been declining while tourism and retirement-related remittances have increased. Sources of income vary widely among coastal counties. For example, Tillamook County has a large economic base from agriculture production, Lincoln County relies on commercial fishing and tourism, while timber production is still a major economic contributor to Coos County (Figure 4). The following discussion highlights the most important sectors of the regional economy.

Agriculture

Agriculture in Oregon's coastal areas is part of a lifestyle that contributes diversity to local economies. It also helps provide a buffer to the variable nature of the forestry, fishing and recreation industries. The agriculture industry has remained consistently strong in Tillamook and Coos counties.

Forestry

Timber harvest increased into the 1980s and has since decreased. Tillamook and Coos Counties have experienced cyclical patterns in timber harvest, depending upon national demand for fiber and local availability of timber. However, harvest volumes and timber industry employment in these areas have generally been in decline. Coastal counties' timberlands are 94% of the land base. There is a mosaic of federal, state, and private timberland ownership in coastal counties (Figure 1).

Commercial Fisheries

Commercial fishing ports contribute to Oregon's statewide and coastal economy (Figure 5). The Oregon commercial fishing onshore landings in 2023 were worth $177.0 million in harvest value. The Dungeness crab fishery alone contributed $85 million in 2023. For detailed information about Oregon's nearshore fisheries up to 2023, please see **Oregon Commercial and Marine Recreational Fishing Industry Economic Activity for Years 2020 and 2021, Addendum 2023**.

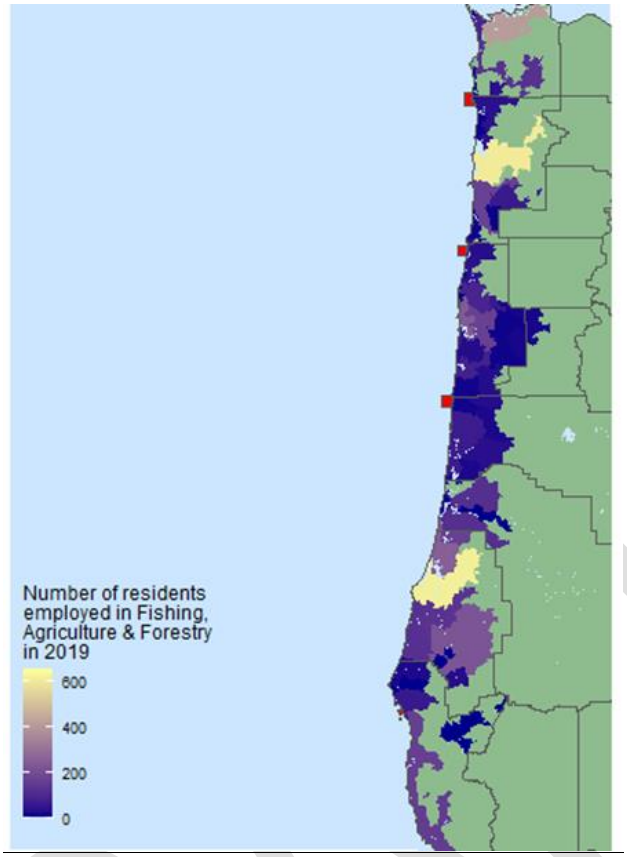

Figure 4. Number of residents employed in fishing, agriculture and Forestry in 2019 based on zip code tabulation areas within 30 miles of coast (Source: 2019 American Community Surveys).

Many fish and shellfish move in and out of Oregon's three mile nearshore boundary throughout their lifecycles. Regardless of where they are harvested, the nearshore habitat and waters are an important component of many of Oregon's commercial fisheries including the Dungeness crab fishery, the commercial salmon fishery, coastal pelagic species fisheries (e.g., Pacific sardine, northern anchovy, and market squid etc.), the urchin fishery, clam fisheries and a variety of groundfish fisheries. Groundfish fisheries which target a variety of flatfish, roundfish, rockfish, sharks, skates and other species occur across the continental shelf with several gear types (trawl net, long line, trap, hook and line). Since the early 1990s, Oregon has managed a commercial fishery composed of small vessels (averaging 25 feet) which target several rockfish species (predominantly black and blue rockfish), cabezon, and greenling in nearshore waters primarily with hook and line or longline gear. Referred to as Oregon's "commercial nearshore fishery", a state limited entry permit framework was implemented in 2004.

Oregon's commercial fisheries are an important contributor to local economies. Seafood buyers, processors and distributors provide a significant number of jobs in coastal ports and inland. While the majority of commercial fishery landings occur in three ports in Oregon (Astoria, Newport and Coos Bay), smaller ports on the southern coast (Bandon, Port Orford, Gold Beach and Brookings) have found a particular niche in supplying the demand for high-value live fish from nearshore waters (Figure 5).

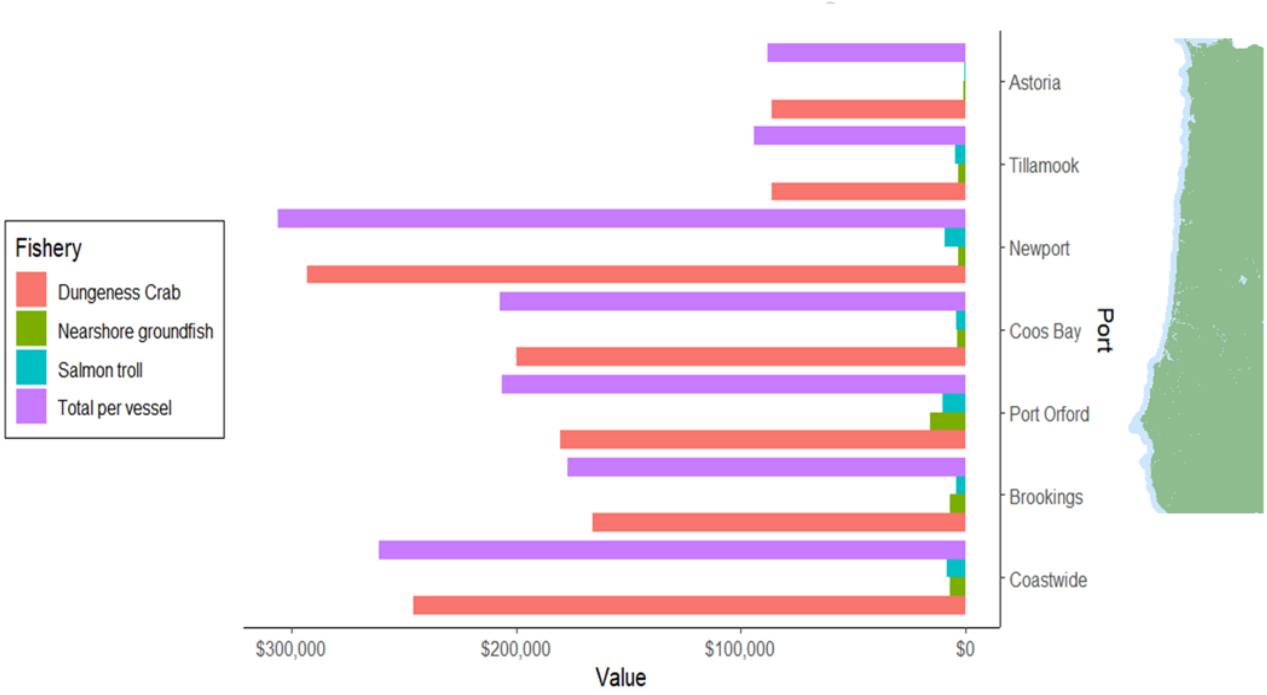

Figure 5. Nearshore fisheries ex-vessel per average revenue in 2021 (Source: PacFIN).

Diverse and healthy ports are critical to the economic survival of fishing vessel owners and operators. Their businesses are dependent on fishing-related service businesses such as vessel dry dock facilities, mechanics, welders, refrigeration specialists, machine shops, marine electronics sales and service firms, professional services (attorneys and accountants) and marine suppliers. Particularly in Astoria and Newport, many vessel repair and provisioning businesses service and support distant water fishing activities. In 2021, an estimated $108M of revenue was generated from Oregon's distant water fleets in Alaska, which is a nearly 38% decline in revenue compared to 2011. This income is brought back to the state by skippers, crewmen and processor workers, and vessel/permit owners with residency in Oregon. Collectively, Oregon's ports support maritime infrastructure while supplying sustainably managed seafood to both domestic and international markets.

Sport Fisheries

Many ports also support sport fishing. In 2021, an estimated 968,000 recreational fishing trips generated roughly $93 million in income coastwide. Most sport charter boat fishing operations are based in Newport, Depoe Bay, Charleston and Garibaldi.

Sport fishing trips target a range of species in both nearshore waters and in offshore waters, which occur outside of the Territorial Sea (beyond 3 nautical miles from shore). Bottomfish fisheries occur primarily in nearshore waters, while tuna fishing almost always occurs far offshore. Halibut, salmon, and other target species are pursued in both areas. In 2021, trips for bottomfish accounted for nearly 20% of all recreational fishing trips along the Oregon coast and 9.4% of total revenue for recreational fishing. The sport bottomfish fishery is an important component of many coastal economies, as it provides stable and consistent income for these communities during times when other seasonal fisheries (e.g., salmon and tuna) are not available.

Sport crabbing and clamming in Oregon bays and nearshore waters is also popular. The bay crab fisheries tend to comprise the majority of this type of harvest with the remainder caught in the ocean. The largest clam fisheries are for razor clams found on Oregon's ocean beaches and a group of clams collectively known as bay clams. Bay clams as the name suggests, are found in the state's many bays and estuaries. They include cockles, butter clams, gaper clams, and native littleneck clams. Clams are targeted for both sport and commercial harvest in Oregon.

Recreational fishing is a significant part of coastal economies. There is a direct link between recreational fishing, coastal tourism, and the service industry. Visiting fishermen and their families contribute substantially to local economies by purchasing licenses, fishing gear and boating accessories, as well as food, lodging and other services.

For more information about the economic contributions of commercial and recreational fisheries on the Oregon Coast between 2020-2023, please see Oregon Commercial and Marine Recreational Fishing Industry Economic Activity published by Shannon Davis.

Coastal Tourism and Recreation

Tourism is a key component of the state's economy, and the Oregon coast is a major destination for visitors. Most coastal counties are experiencing steady growth in tourism. Visitation is increasing at state parks and employment at motels/hotels and food service industries continues to increase. The growth of tourism has diversified coastal counties' economic bases and tourism is a source of employment for many coastal residents (Figure 6).

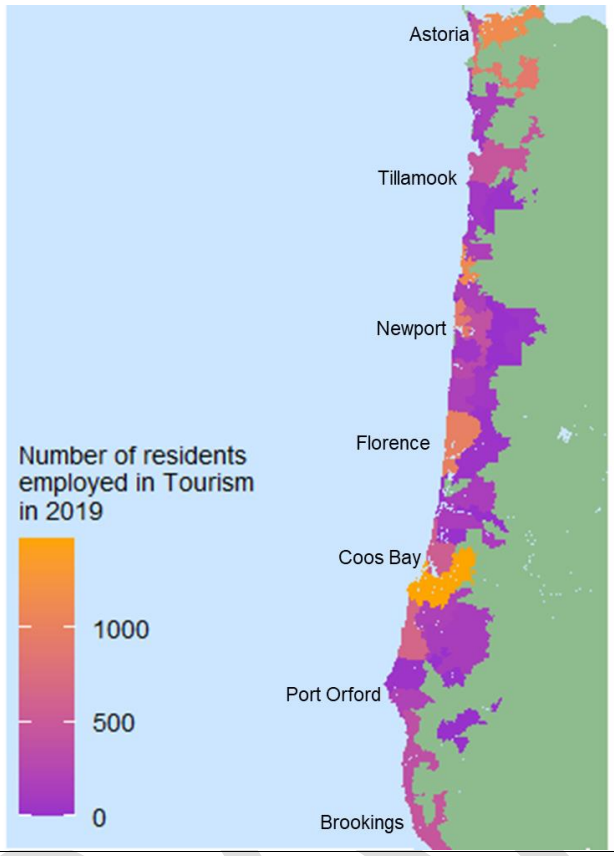

Figure 6. Number of residents employed in tourism industries in 2019 based on zip code tabulation areas within 30 miles of coast (Source: 2019 American Community Surveys).

The Oregon coast marine environment attracts tourism for many experiences other than fishing (

Table 1). Because a trip purpose can be for more than one reason, it is difficult to measure economic contributions directly related to specific nearshore marine resources. At a more general level, the 2013-2017 Oregon Statewide Comprehensive Outdoor Recreation Plan identified ocean and beach recreational activities as the Oregon population's fourth highest outdoor recreation activities. Half of Oregon's households visited the Oregon coast in 2010. Data collected in 2022 shows that the most common recreational activities on the Oregon Coast are hiking, as well as visiting national forests and state parks (

221 Table 1).

222 **Table 1**. Participation in recreational activities on the Oregon Coast from 2021-2022 (Source: Oregon Coast Visitors Association).

	Total	Portland Region	Oregon Coast	Willamette Valley	Central Oregon	Southern Oregon	Mt. Hood/ Columbia River Gorge	Eastern Oregon
Hiking	19.0%	15.5%	29.6%	23.1%	32.5%	27.5%	27.3%	27.2%
Visited national forest, refuge, scenic areas, monuments, and/or Bureau of Land Management areas	14.6%	12.0%	23.4%	17.1%	25.0%	22.8%	22.3%	22.8%
Visited state parks	13.7%	11.5%	24.9%	17.1%	22.4%	19.8%	21.1%	21.1%
Nature observation (wildlife/apiary/wildflower/bird watching/fall foliage)	13.2%	10.2%	21.8%	15.3%	20.2%	19.8%	19.2%	22.3%
Beach-going	11.6%	9.9%	28.4%	14.0%	15.1%	14.6%	17.0%	15.1%
Bicycling	4.8%	3.9%	6.2%	5.2%	11.2%	7.3%	6.9%	8.2%
Swimming	4.0%	3.4%	5.4%	4.3%	8.4%	7.6%	5.8%	8.7%
Fishing	3.5%	2.7%	5.2%	3.8%	6.9%	7.0%	4.7%	7.6%
Visited Crater Lake National Park	3.2%	2.4%	4.5%	3.5%	7.4%	10.2%	5.4%	6.8%
Rockhounding/collecting rock	3.1%	2.3%	5.9%	3.6%	4.9%	5.5%	3.9%	6.4%
Dark sky/star viewing (at an observatory or individually)	2.9%	2.1%	4.4%	3.5%	5.7%	5.2%	4.7%	7.2%
Golf	2.8%	2.2%	3.7%	3.0%	6.3%	4.0%	3.8%	5.0%
Running	2.3%	2.2%	2.9%	2.4%	5.1%	3.9%	4.1%	4.9%
Kayaking	2.2%	1.6%	3.3%	2.7%	4.9%	3.9%	3.2%	4.9%
Visited a hot spring	1.9%	2.0%	2.3%	2.4%	4.4%	3.9%	4.1%	7.3%
Foraging (collecting plants, mushrooms, berries)	1.3%	1.4%	2.2%	1.9%	2.6%	2.6%	3.0%	3.2%
Oyster harvesting/crabbing/clamming	1.2%	1.1%	2.6%	1.2%	1.9%	2.1%	2.3%	2.5%
Sailing/boating	1.2%	0.9%	1.7%	0.9%	1.9%	2.4%	1.7%	2.9%
Whitewater rafting	1.1%	0.9%	1.4%	1.2%	2.3%	3.0%	1.6%	3.3%
Stand-up paddle boarding	1.1%	0.9%	1.4%	1.0%	3.0%	1.9%	1.7%	2.2%
Horseback riding	1.1%	1.0%	1.6%	1.1%	2.1%	2.2%	1.8%	2.8%
Snow activities (snowmobiling, cross-country skiing, snowshoeing, downhill skiing, snowboarding)	1.0%	0.7%	0.7%	0.9%	3.0%	1.6%	1.5%	2.1%
Rock climbing/mountaineering	1.0%	1.0%	1.0%	1.1%	1.8%	2.2%	1.6%	2.9%
Sand dune boarding/buggy	0.8%	0.8%	1.5%	0.9%	1.7%	1.9%	1.5%	2.2%
Hunting	0.8%	0.6%	0.6%	0.6%	1.4%	2.0%	1.0%	3.1%
Surfing, windsurfing and/or kiteboarding	0.7%	0.8%	1.1%	0.6%	1.5%	1.6%	1.4%	2.9%
Scuba diving	0.5%	0.5%	0.4%	0.4%	0.7%	1.1%	0.5%	1.6%
Base	16571	8686	6301	4381	3480	2392	3752	2029

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Wildlife viewing generates more regional economic contributions than recreational hunting and fishing activities combined in Oregon. At almost $1.7 billion, Oregon ranked in the top ten states in the nation for economic output related to wildlife viewing in 2011, with an estimated 1.44 million wildlife watchers. Statewide wildlife watching per trip expenditures have been estimated at $66 per day. An estimated 375,000 tourists went whale watching on the Oregon coast in 2008, resulting in nearly $1.6 million in direct expenditures and an additional $28.2 million in indirect expenditures. This was more than a two-fold increase in direct expenditures over 10 years. Non-consumptive use of the nearshore marine ecosystem is a significant tourism driver. These recreational users of the nearshore ecosystem have been described as a renewable resource for Oregon's coastal communities because of their important economic and cultural contributions.

Restoration and Protection Projects

Conservation protection and restoration projects have economic benefits. Some of the benefits are identifiable and can easily be measured. For example, agency and contractor labor and materials/services payments for management and construction projects will be re-spent in communities generating economic activity that will include the "multiplier" effect. Knowledge about the payments and their source, coupled with economic input-output modeling procedures, provide the measurements. Other benefits are more tenuous to trace, and economic effects are more difficult to estimate because they will not have such direct connections to markets. Economic benefit analysis requires extensive on-site knowledge of biological, ecological, and physical process interrelationships as well as clever ways to assess human appreciation of the setting and interrelations to formulate economic benefit estimates. A growing body of ecosystem service literature describes these tenuous economic benefits. The natural environment provides benefits to people (ecosystem services) that increases individual welfare, but quantifying a measure of change is difficult. Economic benefit studies of conservation and restoration projects generally provide economic impacts of a defined activity but only acknowledge the broader social values.

Several studies have quantified the economic benefits of conservation activities for Oregon coastal communities. The research, planning, and management activities required to establish and maintain Redfish Rocks marine reserve contributed about one-third more than the existing commercial and recreational fishing to the area's local economy. The magnitude of this economic contribution linked to the marine reserve was a surprise to local officials. Another study reviewed the economic benefits of a salmon habitat restoration project on the lower Coquille River. It was a more typical analysis of a restoration project whereby short-term restoration project supervision and construction as well as long-term recreation and commercial fishing economic impacts were included.

Protected and restored environments can promote economic development and reduce the need for state and federal intervention in land uses to protect environments. People are attracted by the use benefits (e.g. fishing, hunting, surfing, wildlife viewing) and the sense

of increased individual welfare. Environmental stressors often accompany economic development. The stresses span coastal ecosystem elements and have cumulative impacts. The challenge is to understand how to best manage and mitigate these impacts. Emerging conservation practices such as ecosystem-based management that accounts for ecosystem service valuation hold substantial promise for protecting coastal marine systems. Carrying out the practices will require a combination of public and private initiatives for success. Ecological understanding, public awareness, and policy initiatives can improve stewardship of the marine ecosystems. This knowledge can facilitate effective management of Oregon's nearshore resources to help ensure sustainable use.

Other Regional Export Income

In some coastal areas, many small manufacturing and service companies export their products outside the region, which also contributes to local economic growth. Industries such as boat building and water-transportation occur in the region. Lincoln County has a growing marine technology economic sector. High amenity areas such as the Oregon coast also tend to attract "footloose" entrepreneurial businesses, economic activities which are not dependent on the specific location's resources for viability. As such, writers, artists, computer hardware and software developers, and other small coastal entrepreneurs sell products outside the coastal area and bring income into regional economies. The cumulative economic contribution of these smaller industry sectors is important along the coast.

Real Estate Investment and Development

Real estate development often occurs in tandem with tourism development in high amenity locations. In 2023 across the state of Oregon, 2.9% of homes are vacant second homes. In contrast, close to half of all homes are vacant second homes in Cannon Beach; close to 1/3 of homes in Tillamook County are vacant second homes, as are close to ¼ of all homes in Lincoln County. This rate of investment in second homes throughout the coast has significant impacts on both housing affordability and availability. Should a substantial portion of these investors retire to these second homes during the next decade, the cultural, social and political dynamics of many coastal communities will be affected.

Coastal Oregon Employment and Retirement Characteristics

Coastal Oregon is far more dependent on employment income from tourism and natural resources than the rest of the state. Coastal Oregon counties have fewer people employed in higher paying management, business and science occupations than the state average and more people involved in service and natural resource occupations than the state average.

Coastal Oregon is also more dependent on retirement income than the rest of the state. The coast has proportionally fewer people under age 65 than both the United State and the

state of Oregon, and a substantially higher proportion of retirement age people (Figure 3). Retirement income is derived from investments and transfer payments (social security). Transfer payments of social security benefits include SSI (disability) income. Many people residing in coastal Oregon receive retirement income (Figure 7).

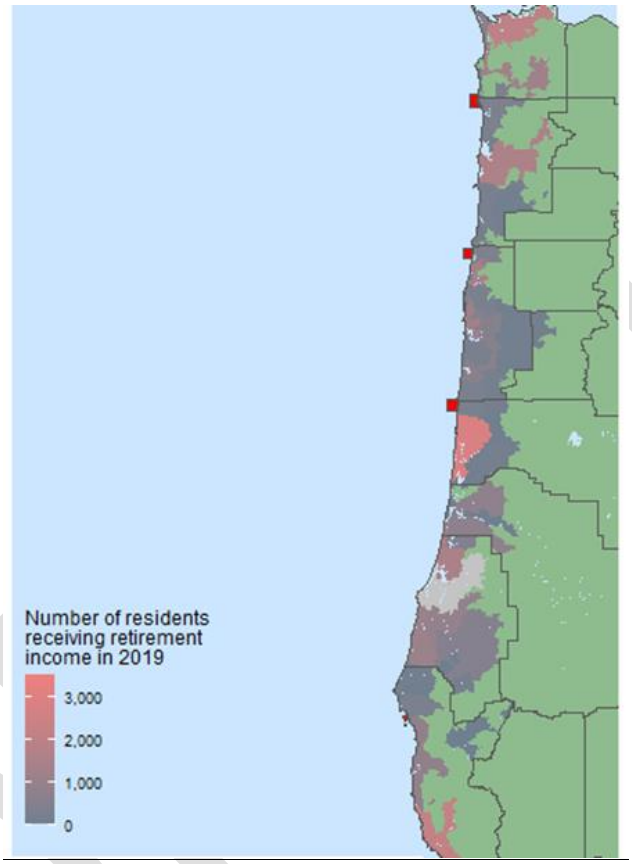

Figure 7. Number of residents receiving retirement income (e.g. social security, pension and retirement collectively known as transfer benefits) in 2019 based on zip code tabulation areas within 30 miles of coast (Source: 2019 American Community Surveys).

Over half of personal income on the coast is derived from investments and transfer payments (Figure 8). This is close to 1/3 higher than the state average, and 46% higher than the proportion of personal income derived from investments and transfer payments at the national level. This dependence on retirement income increased across all coastal counties between 2003 and 2021 (Figure 8). Much of the improvement in average coastal income during this time frame reflects retirement migration patterns, and thus household

income from sources other than earned income among working families. A large proportion of the baby boom generation is retiring, so these trends are likely to continue for the next decade.

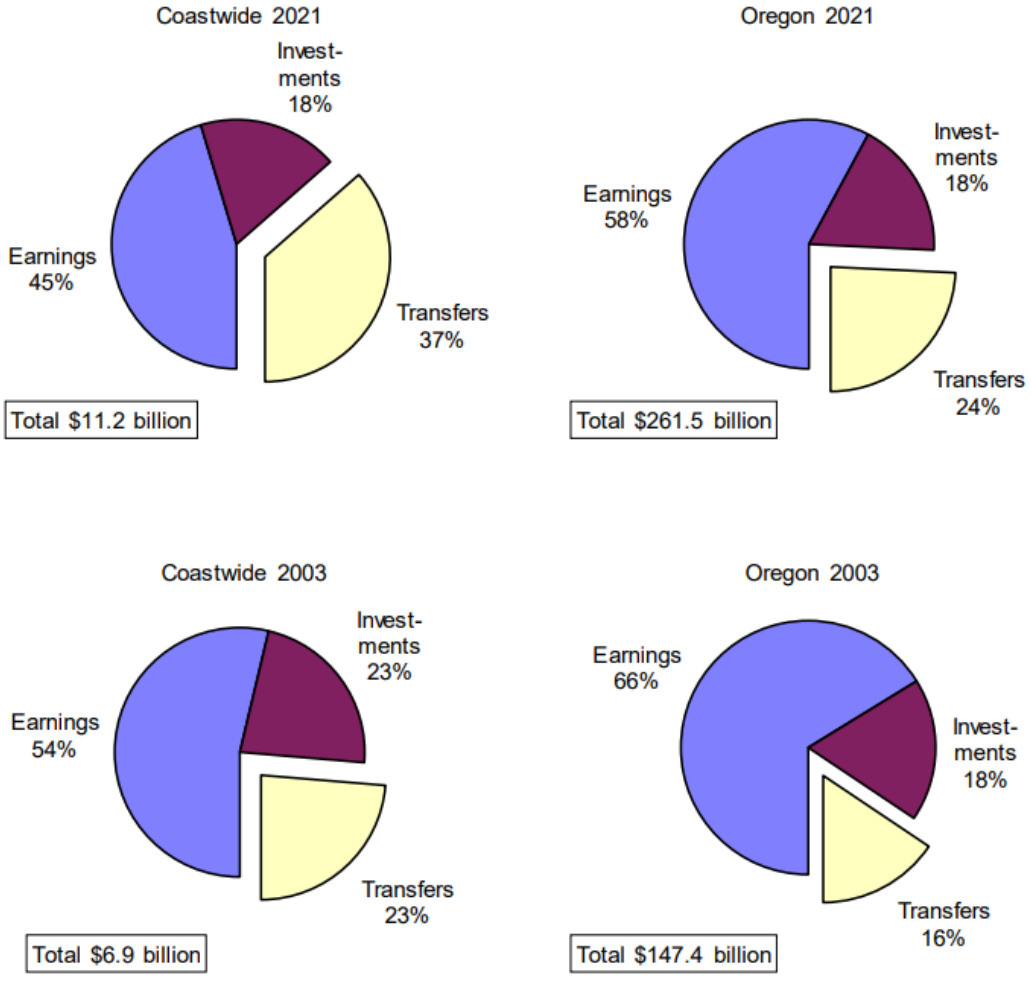

Figure 8. Share of sources of personal income to coastal counties, Oregon, and U.S. in 2003 and 2021 (Source: Oregon Coast Visitors Association, 2021). Note: Personal income in billions adjusted to 2021 dollars.