

NATURAL RESOURCES ELEMENT

The Natural Resources Element of the Comprehensive Plan provides a general overview of all natural resources common to the County. Specific resources such as forest lands and recreation resources are dealt with in greater detail in their respective element of the Comprehensive Plan. In general, natural resources are considered vital to the County's historical and future development, and are recognized as a primary base for the County's economy. The resources captured within this element can be evaluated under Goals 5 (Natural Resources, Scenic and Historic Areas, and Open Spaces) and 6 (Air, Water, and Land Resources Quality), with some limited applicability of Goal 7 (Areas Subject to Natural Disasters and Hazards) Goal 5 has a specific protection mechanism, discussed later in this element. (MC OR-1-2013)

Land Resources

Morrow County encompasses a total of 1,317,760 acres, which (exclusive of residential areas) is generally divided into 1/2 rangeland, 1/4 cropland and 1/4 forest land. Urban areas occupy only approximately 0.2% of the total County.

Soils

The soils in Morrow County have formed in a variety of parent materials. In the northern part of the County soils have developed from a mixture of aeolian and water deposited sands and gravel over basalt bedrock. The central part of the County has soils developing from loess deposits ranging from a few inches to more than 15 feet in thickness. These deposits are generally deeper and coarser textured in the northern part of the County. In a southerly direction, the deposits become finer textured and thinner. Where a thin deposit of loess occurs, the soils developed from a mixture of loess and basalt. In the southern part of the County, soils have developed from a mixture of fine sediments and recent volcanic ash deposits. There is a general soils map for the entire County. It shows only the general pattern of soils, but does give interpretation for both general and detailed soil mapping units. Detailed soil maps for Morrow County can be seen at the Soil Conservation Service Office in Heppner. The general soils map, showing soil associations, is useful to people who want a general idea of the soils in the County, who want to know the location of large tracts that are suitable for a certain kind of land use.

The general soil map, however, is too broad to be suitable for planning the management of a farm or field, or for designing foundations, roadways, ditches, parks, or septic tank absorption fields. These uses require detailed soil survey maps and information and often, onsite investigations.

Minerals

Mineral resources located in Morrow County include small deposits of gem opal in the southern County area, minor coal deposits on Willow Creek south of Heppner and aggregate resources found throughout the County. Except for aggregate resources, development of these minerals has not been economically feasible (Carty coal power plant presently imports its coal from Wyoming). At present, aggregate resources are the only minerals that economically can be mined in the County. Aggregate resources are crushed or uncrushed gravel, stone or sand used in building as cement, asphaltic concrete and fill. The County's best quarry rock for aggregate is Columbia River Basalt which covers a large part of the County, particularly the north end.

See accompanying map titled Inventory of Natural Resources Aggregate and Mineral Resources. Those shown are currently used by private, local and state agencies. All of these aggregate sites are in Columbia River basalt which affords an easily available and nearly limitless source of good quality road metal, rip rap, rock fill, and common stone.

Vegetation

Natural, drought-tolerant grasslands cover the North and Central portions of the County, a good setting for dry land and irrigation farming. The Southeast quarter of the County generally lies in forestlands of the Ponderosa Pine and Grand Fir variety, providing the economy with timber, grazing, hunting and fishing resources. These vegetation areas closely follow the County's general geographical and climatic formations of plateau in the Northwest and mountain highlands in the Southeast.

Water Resources

Five river systems, the Willow-Rhea Creek, Butter Creek, Rock Creek, (a John Day tributary) and the Columbia, supply the County with water for fish and wildlife, domestic needs, recreational uses, agriculture, industrial transportation and general vegetation growth. Additional groundwater sources add to total supply.

Water is a critical factor to development in Morrow County. Agriculture, industry, fish, wildlife, natural vegetation, municipalities, power generation interests, environment and pollution abatement all depend on an adequate supply. To maintain the water supply and economic health of the County, water management programs must be operative.

Present County water supplies result from precipitation, spring run-off from snowpack, groundwater and riverwater. Water impoundments, both natural and man-made, help to store, control and distribute water supplies throughout the year. Water control projects affecting the County include the John Day Dam on the Columbia River, the West Extension Irrigation District, the proposed Snipe Creek and Stanfield Westland projects and the U.S. Army Corps of Engineers Flood Control dam. Other possible water control projects are listed on the accompanying table "Potential Dam Site." Most of these have been determined not to be economically feasible under current economic conditions. This may change in the future. Age-old groundwater pools supply part of the County with good deep-water wells.

Problems and Potential

Morrow County is susceptible to extremes in water supply. Shortage of water in summer months brings near-drought conditions to many parts of the County while flash floods threaten low-lying areas. Seasonal flash floods cause serious water erosion, sediment deposits and flooding problems. Although water management projects, such as check pond construction and other erosion control measures will do much to control these problems, more work is needed.

The Columbia River has long been recognized as a valuable resource, but it has taken on new significance in view of the recent Water Resource Board's declaration of a critical groundwater area in northern Morrow County. Since the State Engineer has not issued any new permits for groundwater development for irrigation for several years and has issued shutdown orders on some existing wells, irrigators, industrialists and some municipalities are looking to the Columbia as a water source. Consequently, a comprehensive inter-state policy for utilization of the Columbia River is most important to Morrow County and its agricultural and food processing industries.

Recent electrical usage rate increases have altered the future of large scale irrigation pumping and the amount of water needed for agriculture.

There are minimal conflicts between uses for the water resources for streams and rivers. Any flood control project built would not interfere with irrigation rights, except for ground taken out of production, and in fact would enhance most of the downstream irrigation rights. A State of Oregon study has not identified any potential low head hydroelectric sites so this is not viewed as a conflict.

Overall water and stream quality provides another continuing challenge to County residents. Recent studies by the Department of Environmental Quality (August, 1978) indicate that Morrow County water stream quality is relatively high compared with other parts of the state. However, the study identified parts of Willow, Rhea and Butter Creeks as having water withdrawal and moderate elevated water temperature and sedimentation problems. No areas in Morrow County were tagged as major non-point source problems in the report.

As federal and State laws (Water Quality Act) strengthen quality requirements for water supplied to the human population, water treatment becomes more difficult and more expensive. Proper management of those activities that reduce water quality would help to maintain high water quality, thus, reducing costs for improving water treatment facilities. Unfortunately, authority for monitoring and regulating those activities does not lie with local government, but will have to be done at the State and Federal level with recommendations made by local County governments.

Air Resources

The air mass lying over Morrow County represents a positive natural resource. Compared with the rest of the state, the County's air quality is usually high. Windy conditions at field harvest or cultivation do cause dust storms which erode the land and temporarily lower the air quality. But the generally high air quality has attracted many residents, tourists, industries and energy facilities to the County. State and Federal air pollution standards, if properly enforced, should help maintain the air quality. Local activities, such as development of wind and solar energy facilities and transportation planning, would help strengthen these air quality standards. In addition, wind studies made at the Carty Coal Plant site near the Boardman Bombing Range indicate that Morrow County receives a fairly steady supply of west blowing wind that makes development of wind-generated power supplies in the County a very real possibility.

Air, Water, and Land Quality

There is very little specific information available about the quality of these three resources in Morrow County. The information included here is from the Pendleton office of the Department of Environmental Quality.

Air quality is good in the County area. There are no industrial emissions. Strong winds, generally from the west or southwest, may occur at any time of year and cause soil and dust movement.

Water quality is also good. During the summer months of 1977, D.E.Q. sampled 10-15 wells in Irrigon and found none contaminated. Septic tank drainfields have been adequate to date to keep wells free of contaminates.

Solid waste management (land quality) is a problem in Morrow County, outside of city limits. There is one landfill operation south of Lexington and one site north of Heppner for limited use only, and there are no facilities for solid waste disposal in northern Morrow County. At the present time, waste materials in the northern County area are disposed of through a franchise-contract agreement with the City of Hermiston. Since services provided by the cities are somewhat inadequate, several illegal dumps are found throughout the County. There are no County health officials to work at cleaning up and monitoring these dumps. They are recognized as a public health threat by D.E.Q.

Inventory of significant noise discharges:

1. P.G.E. Coal Fired Plant - Was conditioned by the Oregon Department of Environmental Quality and meets all applicable standards.
2. Oregon Potato and Gourmet Brands, Port of Morrow - Have proper muffling devices from steam release.
3. The Boeing Engine Test Site - Inactive.

Other Natural Resources

Fish and Wildlife

Morrow County contains several species of amphibians and reptiles, birds (game birds, waterfowl, shore birds, hawks, and owls), mammals (big game, non-game, furbearing, and fish, migratory fish, resident trout and warm-water game fish). Many of these animals (particularly birds) live within the Umatilla National Wildlife Refuge.

Fisheries

The County's fisheries resource is based upon the Columbia River which is the Northern boundary of the County. Steelhead, Trout, Chinook, and Coho Salmon all migrate up the Columbia River to enter tributaries such as the Umatilla and Walla Walla Rivers to spawn in headwater areas. Other species found in the Columbia include sockeye, chum, shad, smelt, and sturgeon.

Fish habitat is affected by water use and management techniques. Dams constructed on the Columbia and smaller streams for hydroelectric and irrigation purposes have severely restricted fish migration while streamside habitat destruction (on the headwaters of area rivers) has reduced available spawning and rearing grounds. In order to maintain a viable fisheries resource, future management will have to include means to correct past mistakes and compensate for any future adverse development.

TABLE 2
Species, Recreational Days Provided and Economic Value
of the Sport Fishery in Morrow County, 1975

<u>Species</u>	<u>Angler Days Provided</u>	<u>Value/Day (1975 Dollars)</u>	<u>Economic Value</u>
Rainbow Trout	7,410	\$11	\$81,510
Warm-water	935	9	8,415
Sturgeon	270	9	2,430
TOTALS	8,615		\$92,355

TABLE 3
Streambank Ownership in Morrow County, 1975

<u>Ownership</u>	<u>Miles Controlled</u>
Public	
Federal	117.5
State	0
County	0
Private	491.5
	609 Miles*

*Ownership for both sides of stream, except Columbia River

Wildlife

There is great diversity of wildlife and wildlife habitat in Morrow County. Rocky Mountain elk and mule deer are the most common big game animals. Both are found in higher elevation forests during the summer months and on the lower elevation bench lands in central and southern Morrow County, during the winter. Black bear and cougar are also present.

TABLE 4
Big Game Species and Their Estimated Summer Populations in Morrow County, 1977

<u>Species</u>	<u>Estimated Population</u>
Mule Deer	19,000
Elk	2,775
Pronghorn Antelope	200*
Black Bear	30
Cougar	5

*Antelope are confined to Ordinance Army Depot lands and are to be used for stocking other suitable areas in eastern Oregon.

Wildlife in some instances is limited by lack of water or by shortages resulting from water-use practices. The Fish & Wildlife Commission has a strong program of habitat enhancement for wildlife in the area.

The Umatilla Wildlife Refuge is located west of Irrigon and is federally managed.

Problems and Potential

Fish and wildlife populations are sensitive to changes in habitat. Since these resources make an important contribution to the County and its livability, the factors affecting wildlife habitat, food sources and population levels (such as increasing number of fishers, hunters, road construction, logging activity and pollution) must be monitored and balanced with the needs of human populations (as for food, fiber, jobs, recreation and solitude). Potential irrigation projects, logging sales and wilderness area allocations must be evaluated in light of their impact on all Morrow County resources. Present individual, industrial and agency efforts should result in a balanced future for Morrow County lands, people and resources.

Unique Scientific and Cultural Resources

Approximately 70% of Oregon has been surveyed by Historians to identify sites and buildings of importance in Oregon's history. Only about 3% of the state has been surveyed for archeological sites of significance. The results of these surveys indicate a high density of possible archeological sites in northern Morrow County along the Columbia River. According to "Archeological Reconnaissance at the Proposed Water Improvements at Irrigon, Oregon" (Cynthia R. Swanson, Bellingham, Washington, February, 1977), Irrigon is located in an area utilized by the Umatilla Indians.

There are no known archeological sites recorded with the Museum of Natural History for Irrigon, though several are recorded within a mile to the east and west along the Columbia River. A permanent village on both sides of the mouth of the Umatilla (about 7 miles from Irrigon) with a population of 500-600 has been identified. A survey conducted by Gilbert Conner and David Temple in 1941 identified a village on the "Washington side of the Columbia River and along the banks of Blalock Island just west of Irrigon." A subsistence area of the Warm Springs Indians has also been identified west of Irrigon.

Local residents of Irrigon have found artifacts along the Columbia and also within the town indicating there are archeological sites present though none have been recorded.

Historical Resources

Morrow County has several historic sites that are included in the "Oregon Inventory of Historic Sites and Buildings." The Oregon Trail, used primarily from 1843-1857, crosses Morrow County. The Emigrant Graveyard/Stage Station Ruin, located on the Oregon Trail, is known for military and Indian activities. It is located on the southern boundary of the Boardman Bombing Range. The Willow Creek Campground, also on the Oregon Trail is located north of Cecil. Five miles east of Upper Well Spring, the Cayuse War Battlefield of 1848 has been identified. The Abiqua Trail, another trail crossing Morrow County, is recognized for prehistory-anthropology significance.

Morrow County has an outstanding museum located at Heppner. The museum is funded by Morrow County. Exhibits include paleontological finds from the area, (others are on display at the Oregon Museum of Natural History at the University of Oregon), Indian artifacts, early American displays, and displays of early Oregon history. Six of the museum rooms are decorated in period furnishings. A costume collection is also included.

A detailed inventory - description of historical buildings and sites in the County has been completed and is on file in the County Courthouse.

The Goal 5 Process

In response to an application for a Post Adoption Plan Amendment (PAPA) to the Comprehensive Plan, or a periodic review work task regarding the protection of a proposed or existing Goal 5 resource site, Morrow County will meet the requirements of Oregon Administrative Rule (OAR) 660 Division 23. The process will thereby protect the listed natural resources for present and future generations. The following resources may be inventoried and protected under the Goal 5 process:

1. Open space;
2. Mineral and Aggregate Resources

3. Riparian corridors, including water and riparian areas and fish habitat;
4. Wetlands;
5. Wildlife habitat;;
6. Federal Wild and Scenic Rivers;
7. State Scenic Waterways;
8. Groundwater Resources;
9. Approved Oregon Recreation Trails;
10. Natural Areas;
11. Wilderness Areas;
12. Energy sources;
13. Cultural areas;
14. Historic resources;
15. Scenic Views and Sites. (MC OR-1-2013)

The standard Goal 5 process, OAR 660-023-0030 through 660-023-0050(f) consists of procedures and requirements for all Goal 5 resource categories, except when superceded by specific rules applied to a given resource. The specific rule for mineral and aggregate resources is outlined in OAR 660-023-0180, which prescribed the Morrow County guidelines in the Goal 5 Analysis in the Comprehensive Plan. Other natural resources with specific protection guidelines are wetlands, wildlife habitat, groundwater resources, natural areas, historic resources, open space and scenic views and sites. Generally for each resource the County will follow a 4-step process to identify and protect the resource:

1. **Determination of Significance.** Determine whether the resource meets the requirements for protection as a significant resource site based on quality, quantity and location information;
2. **Impact Analysis.** Conduct an analysis of the economic, social, environmental, and energy (ESEE) consequences that could result from a decision to allow, limit, or prohibit a conflicting use. There are basically 3 steps to be followed in an ESEE analysis, except as allowed for under specific resource categories. The basic steps are:
 - Determine the impact area;
 - Identify conflicting uses;
 - Analyze the ESEE consequences.
3. **Resource Protection Program.** Based on the ESEE analysis, the County will describe the degree of protection intended for the resource site. The analysis and implementing ordinances shall clearly identify those conflicting uses that are prohibited, allowed and the specific conditions or limitations that apply to the allowed uses. A program to achieve protection will utilize the Significant Resource Overlay Zone that will prohibit, partially or fully allow conflicting uses and describe the process of allowing for development within the resource zone and the impact area.
4. **Amendments.** The County will amend the Comprehensive Plan Inventory of Significant Resources, the Comprehensive Plan Map of Significant Resources, and the Significant Resource Overlay Zone Map to include the site. The amendment to the Comprehensive Plan will have the following information:
 - A. Description, including a map, of the resource area including the impact area;

- B. Information on quality and quantity of the resource;
- C. The analysis language regarding the resource conflicting uses at the site and impact area, and EESE analysis, if any;
- D. The analysis language regarding the significance of the site. (MC OR-1-2013)

Summary of Goal 5 Resource Designations

In 2013 Morrow County did adopt amendments to the Comprehensive Plan Natural Resources Element, Goal 5 Analysis and Review and Revision Chapters as part of a comprehensive update focused on aggregate and mineral resource protections. As part of that update the previously used Division 16 standards were replaced with Division 23 standards, however the Division 23 process was only applied to aggregate and mineral resources. Application of Division 23 standards will be applied to other resource categories when future updates are undertaken. The following list still retains, for the most part, the historical Division 16 categorization of 1B, 2A and 3C. Additionally the text pages are known to be out of order and will need further refinement. (MC OR-1-2013)

<u>Resource</u>	<u>Text(pp)</u>	<u>Remarks</u>	<u>Designation</u>
Open Space	14	Not site or area specific. General description of land resources p. 69 (only 0.2%of County is urban). Natural Resource Policies A-E (p. 79); F, I, K, M, (p. 80); Land Resources policies B-G, (p.81). Policies sufficient to support 1B designation.	1B
Minerals			
Coal/Methane	14	General area; not site specific. Public and private land. EFU and FU zones. Additional information needed. Natural Resource Policy B; F, I, J Land Resource Policies A, C, E,	
Gemstones	15	General area; not site specific. Plan Policies as above (i.e., Coal/Methane). Additional information needed.	
Plant Fossils	15	Public land. FU zone. Note Ecological and Scientific Areas.	
Pumice/cite	16	General area (Map); not site specific. Public and private land. Applicable plan policies as in Coal/Methane (above). EFU zone. Additional information needed.	
Clay Deposit	ZZ	Public land (Umatilla Nat. Forest). FU zone. Site specific (Map); DOGAMI report	

Aggregate	16	Site specific (Note Map). Public and private land. Applicable policies A, B, F, I, J, M, A, C, D, E, G. EFU, FU, SF-40, MG, PI, SAI, RRI zones.	
Energy Sources			
Coal/Methane	14	Public and private land. Note Coal/Methane under Minerals heading. EFU and FU zones. Additional information needed.	1B
Hydro-Electricity	19	Site specific (Map); Sites presently uneconomical (p. 71, 154). Applicable policies: B (p. 79); G, I, J, M, A (p. 80); 2.C, E, 3A, B (p. 80), D, E (p. 81), Policy 2 (p. 155), 5C (p. 82).	1A
Solar	19	General information (p. 153). Not site specific. Additional information needed. Applicable policies: 1-3 (p. 155); 4, 5, 9, 10, 11 (p. 156); 15 (p. 157).	1B
Wind	19	General information (p. 153). Test area in Boardman Bombing Range (Note archeology map). Additional information needed. Applicable policies 1-3 (p. 155), 10, 11 (p. 156).	1B
Fish and Wildlife			
Big Game	20	General information (pp. 75-76). Public and private land. Area specific. Residential dwellings, the principal conflict, is resolved through density standards under resource zoning (FU, EFU zones) and siting standards under the SR zone. Applicable policies (in addition to general resource policies): A, B, D (p. 82); F, G, H (p. 83).	3A/3C;2A
Upland Game	21	Three specific wildlife management areas and in riparian habitat areas. Applicable policies: 5A, D (p. 82); 5E, G, H (p. 83).	2A/3C
Birds/Waterfowl			
Riparian Habitat	23	Specific streams and water bodies identified. Other wildlife depend on Riparian Habitat.	2A/3C
Non-Game Birds and mammals	25	Located within specific WMA's and throughout the County.	2A;3C
Bald Eagle and Golden Eagle nest sites	26	Bald eagles and golden eagle nest sites located on private land	3C
Long-billed Curlew	26	Only general habitat identified. Some nesting habitat areas located on public lands.	2A; 1B

Three-Mile Island	26	Habitat for a variety of birds. Public ownership (Army Corps of Engineers)	2A
WA Ground Squirrel	26	Specific area. Located on federal land. (Boardman Bombing Range). Designated Research Natural Area by Nature Conservancy.	2A
Furbearers	27	Principal habitat near streams. Conflicting uses; furbearers also within protected wildlife areas (federal/state).	2A/3C
Fish Habitat	28	Sensitive ponds and streams identified. Riparian Habitat.	3C
Ecological/ Scientific Natural Areas	29		
Umatilla Natl. Wildlife Ref.		Owned and managed by federal government.	2A
Coyote Springs WMA		Owned by federal government. Long-term lease to state.	2A
Irrigon WMA		Owned by federal government. Long-term lease to state.	2A
Boardman Bombing Range		Owned and managed by federal government.	2A
Plant fossils		Geologic formation within national forest (public land).	2A
Sand Hollow		Natural Grassland. Identified by The Nature Conservancy. Additional information needed.	1B
Eight-mile Grassland		Natural Grassland. Identified by The Nature Conservancy. Additional information needed.	1B
Three Mile Island		Federal ownership. Sea bird colony.	2A
LaFevre Prairie		Private ownership. Wildflower area. Additional information needed.	1B
Boardman Slough		Federal ownership. Wildlife habitat.	2A
Service Canyon Grassland		Private ownership. Identified by The Nature Conservancy. Additional information needed.	1B

Gene Wood Creek	Private ownership. Natural Grassland. Additional information needed.	1B
Houselog Creek	Private ownership. Natural Grassland. Additional information needed.	ZZ
Rhea Creek	Sensitive stream. Western brook lamprey. Additional information needed.	1B
Scenic Views; 32 sites	Addressed in plan (p. 69) but none identified.	1B
Water Areas, 32 Watershed, Wetlands and Groundwater	Area specific (groundwater). Applicable policies: 3A, B, C (p. 81); E (p. 82). Critical groundwater area identified (Butter Creek area on Water Resource map).	3C/2A
Wilderness Areas	County does not contain wilderness areas.	N/A
Historic Sites, 36 Structures & Objectives		
Archeological	Information available for some sites (Map); other sites exist but not recorded. Applicable policies: 7A, B, C, D (p. 83); 7E F (p. 84).	3A;1B
Historical Oregon Trail	Wells spring segment. Public land. National Register. Bombing Range (Note discussion of Boardman Bombing Range).	2A
Willow Creek Campground	Private property. EFU zone.	2A
Cayuse Battlefield	Fenced monument and plaque. Public land.	2A
Willow Creek Bridge	Co. Rd. 546. Eligible for National Register (5-2-85).	3A
Rhea Creek Bridge	Co. Rd. 705. Eligible for National Register (5-2-85). Applicable Historic Resource policies: 1A, B, E (p. 79); 11 (p. 80); 7A, F (pp. 83-84).	3A
Emigrant Graveyard	Protected within Boardman Bombing Range.	2A
Stage Station Ruin	Range (Public land).	

Cecil General Store	Private property.	3C
Hardman Townsite	Additional information needed.	1B
Cultural Areas	Morrow County does not contain unique cultural area.	N/A
Potential/Approved Recreation Trails	Morrow County does not contain potential or approved recreation trails.	N/A
Potential/Approved Federal Wild and Scenic Waterways; State Scenic Waterways	Morrow County does not contain potential or approved state/federal wild or scenic waterways.	N/A

THE GOAL 5 ANALYSIS

In 2013 the mineral and aggregate Goal 5 analysis and policies were updated. This update included a change from OAR Division 16 to OAR Division 23 protection procedures and thereby eliminated the old Division 16 Goal 5 categories with numbers and letters such as 1B, etc. This change is reflected only in the Mineral and Aggregate references. When the County updates the remaining sections of this part of the Comprehensive Plan, the references to the old Division 16 categories will be gradually eliminated and replaced with Division 23 protections. (MC OR-1-2013)

Open Space: 1B

References: Plan (p. 69, general description of land resources). Applicable policies: 1A-E (p. 79); 1F, I, K, M (p. 80); 2 B-G (p. 81).

Analysis: Morrow County is very rural with only 0.2% of the county in urban development (p. 69); other land uses include rangeland (about 1/2 of the county), cropland (1/4) and forest (1/4). Maintaining open space, even in urbanizable areas, does not pose a problem.

Although the County Plan does not specifically address open space, plan policies insure that it is incorporated in county planning.

Conclusion: The county has not identified a need for open space or specific areas where it would be desirable. Open space has been accorded a category of 1-B.

Mineral and Aggregate Resources

When an application has been received to protect an aggregate or mineral resource, or the County decides to inventory mineral and aggregate resources in its jurisdiction, the County will use the definitions in OAR 660 Division 23. The protection process will meet the requirements as outlined below dependent upon the zoning of the subject property and the size of the mining operation. (MC OR-1-2013)

Option 1. Large sites on land zoned for Farm Use (EFU, RRI and SF40) with more than 500,000 tons of material to be mined:

- I. Significance. Quality, quantity, and location of the resource must meet the following criteria:
 - A. A representative sample of aggregate material on the site must meet ODOT specifications for base rock for air degradation, abrasion, and soundness,
 - B. The estimated amount of material is more than 500,000 tons over the duration of the mining operation;
 - C. Location criteria involves whether or not more than 35 percent of the proposed mining area consists of soil classified as Class II or a combination of Class II and Class I or Unique soil. Generally, Morrow County soils are not of these prohibitive classifications where aggregate sites are concerned. A Soils Map must be included in the analysis, however.
- II. Impact Analysis: The possible conflicts to be analyzed are specifically limited to dwellings, noise, dust and other discharges, transportation issues, safety, conflicts with agricultural practices and other Goal 5 protected resources, Once conflicts have been identified, reasonable and practicable measures that can be taken to reduce the

conflicts are analyzed. If no conflicts exist or if they can be minimized, mining must be allowed. If conflicts do exist and they cannot be minimized, an economic, social, environmental, and energy (ESEE) analysis must be fully done. The analysis may address each of the identified conflicts, or it may address a group of similar conflicts. The County may develop one ESEE analysis for mining sites within similar zoning designations that will contain a matrix of commonly occurring conflicts and apply the matrix to future mining analyses.

- A. Determine an impact area for the purpose of identifying conflicts with the proposed mining and processing activities. The impact area shall be large enough to include existing uses allowed in the Zone, but shall be limited to 1,500 feet from the boundaries of the mining area, except where factual information indicates significant potential conflicts beyond this distance.
- B. Determine existing or approved land uses within the impact area that are conflicting uses and the potential conflicts created by the proposed mining operation. Conflicts shall be limited to those as follows:
- C. Determine reasonable and practicable measures that would minimize the conflicts identified. The measures shall meet the following standards:
 1. They shall not force a significant change in accepted farm or forest practices on surrounding lands devoted to farm or forest use; or
 2. Significantly increase the cost of accepted farm or forest practices on surrounding lands devoted to farm or forest use
- D. Dwellings allowed by a residential zone on existing platted lots and other uses for which conditional or final approvals have been granted;
 1. Conflicts due to noise, dust, or other discharges with regard to those existing and approved uses and associated activities that are sensitive to such discharges;
 2. Potential conflicts to local roads used for access and egress to the mining site within one mile of the entrance to the mining site unless a greater distance is necessary in order to include the intersection with the nearest arterial identified in the Transportation System Plan. Conflicts shall be determined based on clear and objective standards.
 3. Safety conflicts with existing public airports due to bird attractants;
 4. Conflicts with other Goal 5 resource sites within the impact area included in the Comprehensive Plan's Inventory of Significant Resources;
 5. Conflicts with agricultural practices; and
 6. Other conflicts for which consideration is necessary in order to carry out the goals and policies of the Comprehensive Plan and Oregon State regulations.
- E. An analysis of the ESEE consequences is not necessary if reasonable and practicable measures are identified to minimize the identified conflicts and mining shall be allowed at the site.
- F. ESEE Consequences Analysis for conflicts that cannot be minimized: The analysis may address each of the identified conflicting uses, or it may address a group of similar conflicting uses. An ESEE analysis will:
 1. define the impact area;
 2. identify dwellings within the impact area, either existing or for which conditional or final approvals have been granted, that will be adversely affected by the proposed mining operations;

3. identify other conflicts due to noise, dust, other discharges, transportation, safety to public airports, other Goal 5 resources sites within the impact area, conflicts with agricultural practices, and other conflicts for which consideration is necessary in order to carry out the requirements of DOGAMI;
 4. analyze the economic, social, environmental, and energy (ESEE) consequences of the conflicts. This analysis will include information regarding future conflicts to a proposed mining site in order to contribute to the resource's protection plan if the mining would be allowed.
- G. Present the County's decision whether or not to allow mining based on the ESEE analysis by either allowing, limiting, or not allowing mining at the site with consideration to the following:
1. The degree of adverse effect on existing land uses within the impact area;
 2. Reasonable and practicable measures that could be taken to reduce the identified adverse effects; and
 3. The probable duration of the mining operation and the proposed post-mining use of the site.
- III. Resource Protection Program. When mining is allowed at a site, the County must then consider whether to limit new uses that might occur in the impact area in order to protect the significant mining resource. One of the following determinations will be reached with regard to new, conflicting uses in the impact area:
- A. Prohibit the conflicting use. This would be because the mining operation as a resource is more important compared to the conflicting use, and the ESEE consequences of allowing the conflicting use would be detrimental to the resource.
 - B. Allow the conflicting use in a limited way. The County may decide that both the resource site and the conflicting uses are important compared to each other, and, based on the ESEE analysis, the conflicting uses should be allowed in a limited way that protects the resource site to a desired extent.
 - C. Fully allow the conflicting use. The county may decide that the conflicting use should be allowed fully, notwithstanding the possible impacts on the mine. The ESEE analysis must demonstrate that the conflicting use is of sufficient importance relative to the resource site, and must indicate why measures to protect the resource to some extent should not be provided.
- IV. Comprehensive Plan Amendments. Whenever the County Court has deemed a mining operation to be significant by the standards set forth in this Plan, the site will be included in the County's Comprehensive Plan Inventory of Natural Resources - Aggregate and Mineral Resources, the Comprehensive Plan Map of Significant Aggregate and Mineral Resources, and the Significant Resource Overlay Zone Map to include the site, including the impact area. The amendment to the Comprehensive Plan Inventory of Natural Resources will have the following information:
- A. Description, including a map, of the resource area including the impact area;
 - B. Information on quality and quantity of the resource and the significance of the site;
 - C. The analysis language regarding the resource conflicting uses at the site and impact area and ESEE analysis, if any;

- D. The analysis language regarding whether or not mining is allowed, including levels of allowed conflicting uses;
- E. Provisions for post mining use, which shall be determined in coordination with DOGAMI. (MC OR-1-2013)

Option 2. Small sites on land zoned for Farm Use (EFU, RRI and SF40) with 500,000 tons or less of material to be mined:

- I. Significance: The aggregate site must meet the following conditions to be considered significant under this section:
 - A. The quantity of material proposed to be mined from the site is estimated to be 500,000 tons or less over the duration of the mining operation;
 - B. Not more than 35 percent of the proposed mining area consists of Class I, Class II, or a combination or Unique soil.
- II. Approval Criteria. When determined to be significant under this section, an aggregate site on farmland must meet the following criteria:
 - A. The proposed aggregate mine shall satisfy the standards of the Conditional Use Permit approval process outlined in the Zoning Ordinance;
 - B. Post mining use of the site shall be a use allowed under in the Zoning Ordinance and provided for in coordination with DOGAMI regarding the regulation and reclamation of aggregate sites, except where exempt.
 - C. The Conditional Use Permit shall not allow mining of more than 500,000 tons of material.
- III. Comprehensive Plan Amendments. The site will be included in the County's Comprehensive Plan Inventory of Natural Resources - Aggregate and Mineral Resources. (MC OR-1-2013)

Option 3. Mining 500,000 tons or less of aggregate material on land zoned for Farm Use (EFU, RRI and SF40) AND applicant desires long-term protection of the resource via application of an Impact Area:

- I. Significance (based on OAR 660-023-0180(3.)(b) allowing a lower County threshold for significance). Quality, quantity, and location of the resource must meet the following criteria:
 - A. The estimated amount of material to be mined is between 100,000 tons and 500,000 tons over the duration of the mining operation;
 - B. A representative sample of aggregate material on the site must meet ODOT specifications for base rock for air degradation, abrasion, and soundness;
 - C. Soils analysis must show that not more than 35 percent of the proposed mining area consists of soil classified as Class II or a combination of Class II and Class I or Unique soil.
- II. Impact Analysis. The possible conflicts to be analyzed are specifically limited to dwellings, noise, dust and other discharges, transportation issues, safety, conflicts with agricultural practices and other Goal 5 protected resources. Once conflicts have been identified, reasonable and practicable measures that can be taken to reduce the conflicts are analyzed. If no conflicts exist or if they can be minimized, mining must be allowed. If conflicts do exist and they cannot be minimized, an economic, social, environmental, and energy (ESEE) analysis must be fully done. The analysis may

address each of the identified conflicts, or it may address a group of similar conflicts. The County may develop one ESEE analysis for mining sites within similar zoning designations that will contain a matrix of commonly occurring conflicts and apply the matrix to future mining analyses.

- A. Determine an impact area for the purpose of identifying conflicts with the proposed mining and processing activities. The impact area shall be large enough to include existing uses allowed in the Zone, but shall be limited to 1,500 feet from the boundaries of the mining area, except where factual information indicates significant potential conflicts beyond this distance.
- B. Determine existing or approved land uses within the impact area that are conflicting uses and the potential conflicts created by the proposed mining operation. Conflicts shall be limited to those as follows:
- C. Determine reasonable and practicable measures that would minimize the conflicts identified. The measures shall meet the following standards:
 1. They shall not force a significant change in accepted farm or forest practices on surrounding lands devoted to farm or forest use; or
 2. Significantly increase the cost of accepted farm or forest practices on surrounding lands devoted to farm or forest use
- D. Dwellings allowed by a residential zone on existing platted lots and other uses for which conditional or final approvals have been granted;
 1. Conflicts due to noise, dust, or other discharges with regard to those existing and approved uses and associated activities that are sensitive to such discharges;
 2. Potential conflicts to local roads used for access and egress to the mining site within one mile of the entrance to the mining site unless a greater distance is necessary in order to include the intersection with the nearest arterial identified in the Transportation System Plan. Conflicts shall be determined based on clear and objective standards.
 3. Safety conflicts with existing public airports due to bird attractants;
 4. Conflicts with other Goal 5 significant resource sites within the impact area included in the Comprehensive Plan's Inventory of Natural Resources;
 5. Conflicts with agricultural practices; and
 6. Other conflicts for which consideration is necessary in order to carry out the goals and policies of the Comprehensive Plan and Oregon State regulations.
- E. An analysis of the ESEE consequences is not necessary if reasonable and practicable measures are identified to minimize the identified conflicts and mining shall be allowed at the site.
- F. ESEE Consequences Analysis for conflicts that cannot be minimized: The analysis may address each of the identified conflicting uses, or it may address a group of similar conflicting uses. An ESEE analysis will:
 1. define the impact area;
 2. identify dwellings within the impact area, either existing or for which conditional or final approvals have been granted, that will be adversely affected by the proposed mining operations;
 3. identify other conflicts due to noise, dust, other discharges, transportation, safety to public airports, other Goal 5 resources sites within the impact area, conflicts with agricultural practices, and other

- E. Provisions for post mining use, which shall be determined in coordination with DOGAMI. (MC OR-1-2013)

Option 4. Mining in land use zones other than Exclusive Farm Use Zones.

Morrow County has land use zones, such as Port, General and Space Age Industrial and the Forest Use Zone, which have extensive tracts of land, much of it traditionally used for agricultural or forest purposes. This section will provide applicants for mineral and aggregate sites of 100,000 tons or more to be included in Morrow County's Inventory of Natural Resources - Aggregate and Mineral Resources and the Significant Resources Overlay Zone. It should be clear that this process as outlined is voluntary and is not required in any of these zones to allow mining. These provisions would provide additional protections not otherwise available with a Conditional Use Permit.

In response to an application for a Post Acknowledgment Plan Amendment (PAPA) to include a mineral or aggregate site on Morrow County's Inventory of Natural Resources - Aggregate and Mineral Resources, the County may process the application as follows:

- A. Mines producing minerals other than aggregate that will produce more than 5,000 cubic yards of material - follow OAR 660-023-0040 and OAR 660-023-0050 for approval. Amend the Comprehensive Plan Map and Inventory of Natural Resources - Aggregate and Mineral Resources to include the site.
- B. Aggregate sites that will produce more than 100,000 tons of material will follow the procedures in Option 3 the exception being the amount of material mined is over 100,000 tons with no upper limits. (MC OR-1-2013)

Aggregate Mines with Goal 5 Protection. A list of aggregate sites, attached as Appendix, includes both those with protections under Goal 5 and those located on farmland required to be listed in the Comprehensive Plan. Some were declared significant when the Comprehensive Plan was adopted in 1980 and acknowledged in 1986, and others were on Morrow County's inventory of significant aggregate sites as of September 1, 1996, thus meeting the requirements of OAR 660-023-0180(3)(c). The remainder, approved since that date, were protected under the rules prescribed in OAR 660 Division 023, some being protected under Goal 5 with the majority being on farmland and meeting the requirement of listing in the Comprehensive Plan. (MC OR-1-2013)

Coal/Methane

References: Mineral Resource Map; Water Resources Map; Wildlife Resources Map; Plan Text

Location; Quality/Quantity: The location of coal and methane is not site specific but area specific. Geologic reports indicate that the coal is low-grade and at present, uneconomical to extract (Plan, p. 70). Methane, also uneconomical to extract at this time, is associated with the coal deposits. The coal/methane area is located in forest use and exclusive farm use zones. The land is in public (FU) and private (EFU) ownership.

If coal/methane extraction becomes feasible, economic benefits must be weighed against those derived from forest use, and sensitive wildlife habitat. These uses may be mutually exclusive. Hydro-electric sites are not considered to be economically feasible at this time. Economic trade-offs can only be considered when conditions change (i.e., when it becomes economical to

extract coal/methane). Local communities could grow if coal/methane extraction became a reality.

Environmental impacts would be a significant consideration. These would include but not limited to impacts on watershed and fish and wildlife habitat. Much of the coal/methane area is on federal land. Energy gains include the utilization of coal/methane. Expenditures include the building and/or upgrading of roads.

Conclusion: Morrow County considers the extraction of coal/methane a remote possibility. Any development on public land must be preceded by an environmental impact statement as required by federal regulations. Coal/methane is area specific, but its quantity has not been fully determined. The resource's future prospects are insured by the County's natural resource policies and mineral resource policy. At each plan update, the County will consider available mineral resource data.

Gemstones (Opal)

References: Mineral Resources Map; Plan text; Applicable Plan Policies.

Location; Quality/Quantity: Gem opal is area specific; quantity is not known. Mining of this mineral is not considered to be economically feasible at this time.

The gem opal location is within the County's forest use (FU) zone. Mining is a conditional use. At present, mining gem opal in Morrow County is not economically feasible. Large scale mining could have a discernible impact on nearby communities. The extent, however, is yet to be determined. Environmental impacts of mining include the possibility of stream pollution, soil erosion, and disturbance of wildlife habitat. Energy would be expended in the mining process. The cost, however, would be off-set by the value of the mineral. Access roads are nearby.

Goal 5 Designation: The extent of gem opal occurrence is largely unknown. The quality of the mineral, however, does not support mining at this time. Morrow County has designated the gem opal site as a mine extracting less than 500,000 tons of material. (MC OR-1-2013)

Plant Fossils

References: Plan (reference); Mineral Resource map (fossil plants); DOGAMI (reference).

Location; Quality/Quantity: Plant fossils are known to occur in at least three locations (Mineral Resources map) and are associated with coal bearing formations. Their value is of scientific/historical interest rather than economic. The three sites are within the National Forest boundary which is not subject to county regulation.

Goal 5 Designation: None. The three identified sites are point locations of a larger formation. The federal government has jurisdiction over the land use.

Pumice/Pumicite

References: Mineral Resources Map, DOGAMI (Mineral and Water Resources of Oregon, Bul. 64, 1969); Water Resources Map (comparison);

Location; Quality/Quantity: Widely scattered deposits of pumice or pumicite occur in northern half of Morrow County (Mineral Resource map). The resource is area specific, not site specific.

Quantity has not been assessed. There is not an indication, however, that deposits have commercial value. Pumice/pumicite occurs in the county's EFU zone and may be extracted through a conditional use permit. The general area also includes potential hydro-electric sites, wildlife refuges, and critical groundwater situations. Impacts would have to be assessed through a site-specific conditional use permit.

Goal 5 Designation: None. The county's pumice/pumicite deposits do not appear to have economic value at this time. Deposits occur over a wide area, consequently, little is known about quantity.

Energy Resources

Hydro-electric - 1A

References: Plan, p. 71, p. 154 (general discussion); Water Resources map (potential dam sites). Applicable plan policies: 2 A (p. 80), 2 C (p. 81), 3 B (p. 81), 1, 2 (p. 155); 10, 11 (p. 156), 16 (p. 157).

Location; Quality/Quantity: There is not an abundance of water in Morrow County, therefore, hydro-electric dam sites are, at best, minimal (p. 155). The State of Oregon has recently completed a low-head hydro study of Morrow County streams -- indicating that no sites are feasible (p. 154). None of the potential dam sites listed in the plan or depicted on the water resource map have been identified as hydro-electric sites.

Solar - 1B

References: Plan (p. 153); Applicable policies: 1-3 (p. 155); 4, 5, 9, 10, 11 (p. 156), 15 (p. 157); Subdivision Ordinance.

Location; Quality/Quantity: The county plan does not treat solar resources as site specific. National Weather records indicate 107 clear days per year for Pendleton. Non-mountain areas in Morrow County would be similar. Solar easements are addressed in the Morrow County Subdivision Ordinance 5.040(7).

Conflicting Uses: Potential conflicting uses exist (e.g., structures, trees). Conflict, however, can only be addressed generally until specific sites are identified.

Conclusion: Solar energy resources have been accorded a 1B designation.

Wind - 1B

References: Plan, p. 153 (general information). Test area for wind-power generation depicted on archeology map (Boardman Bombing Range). Applicable plan policies: 1-3 (p. 155), 10, 11 (p. 156).

Analysis. Prevailing air flow in eastern Oregon is westerly. Almost any location below 1,400 feet elevation, where most of the population lives, is subject to sustained wind. Mean wind speed for Pendleton is about 9.2 mph; this would be expected for similar Morrow County locations. Some testing was completed at the Boardman Bombing Range but data are not readily available. Average wind speed required for energy production is about 12 miles per hour (p. 155).

Conclusion: Wind-generated power may be feasible. Data may be available for wind consistency and velocity at the Boardman Bombing Range. Other data sources or potential wind generated power sites are not known. Goal 5 Designation: 1B.

Wildlife Habitat

Big Game - 3C

References: Plan (p. 76); Wildlife Resources Map; Fish and Wildlife Protection Plan for Morrow County (January, 1979); Applicable Plan policies: s. B-E (p. 81); 5, F-H (p. 83).

Analysis: Morrow County's big game includes mule deer, elk, pronghorn antelope, black bear, and cougar (Plan, p. 76). Big game sensitive habitat are those areas less than 3,000 feet elevation that provide the necessary food, cover, and water during the winter months. Two areas for elk and deer are depicted on the Sensitive Big Game Habitat map in the Protection Plan (note reference above). One of these areas is under federal jurisdiction and is not shown on the County plan's Wildlife Resources map. Antelope are confined to the Army Ordinance Depot lands and is also under federal jurisdiction (Plan, p. 76).

Quality/Quantity: Big game habitat occurs within the County's Exclusive Farm Use (EFU) and Forest Use (FU) zones. This is a mixture of public and private land ownership. Antelope are confined to Army Ordinance Depot land. This land has consequently been accorded a Goal 5 designation of 2A (no conflicting use).

The quality of these areas is insured through the County's plan policies and zoning classifications. The zones in which big game habitat are located meet either Exclusive Farm Use (ORS 215.213) or stringent Forest Use standards. Minimum parcel size for EFU land is 160 acres; the FU zone minimum is 80 acres. In addition, EFU and FU ordinances specifically address Big Game Range Restrictions. Within the big game winter range, the dwelling density is one unit per 160 acres (Ord. 3.010(5)(E)). Big game ranges within the FU zone require a density of not more than one dwelling per 160 acres.

Conflicting Uses: Conflicting uses are those which, if allowed, could negatively impact big game habitat. Primary conflicting uses include dwellings and any activity that would physically destroy the habitat itself. The EFU and FU zones allow dwellings outright and conditionally. Other land uses may occur in either zone; although usually small in scale, they could be detrimental (e.g., mineral extraction). The intent of the zone itself (e.g., agriculture and forest use) could conflict with wildlife habitat.

Economic, Social, Environmental, and Energy (ESEE) Considerations

Economic impacts of allowing conflicting uses are complex. Diminishing critical wildlife habitat results in the reduction of animals. This in turn impacts hunting--which contributes to area economy. According to ODFW data, the 1977 gross economic impact of big game hunting in Morrow County was \$4,530,545 (Source ODFW Habitat Protection Plan, February 1979, Table 5, p. 14). There are also impacts associated with maintaining critical wildlife habitat areas. Dwelling density is restricted. In addition, large game animals migrate from management areas onto private land and eat hay crops. This constitutes an economic loss to the farmer or rancher. Social impacts do not appear to be significant.

Adverse environmental impacts also arise from allowing conflicting use. The presence of dwellings tends to drive animals away. This is especially serious in designated critical wildlife areas. Impacts associated with energy do not appear to be significant.

Goal 5 Designation: Big game habitat is accorded a 2A designation where it coincides with public land (no conflicting use) and a 3C designation where it coincides with private land (specifically limit conflicting use). Conflicting uses are inherent in EFU and FU zones.

Program to Achieve the Goal: Protection of big game habitat is achieved through plan policies; the County's adoption of ODFW's Fish and Wildlife Habitat Protection Plan for Morrow County, 1979, the 160-acre density standards established under the resource zones (EFU and FU zone) and the siting standards under the SR zone.

Upland Game Birds; Waterfowl - 3C, 2A (Public Land)

References: Plan (ref.); Wildlife map shows three sensitive habitat areas; Fish and Wildlife Protection Plan for Morrow County, ODFW, 1979, pp. 15-19 (upland game birds), pp. 19-21 (waterfowl); Applicable policies: 1. (F) pp. 79-80, I. (I,K), p. 80; 2. (b), p. 81, 5. (A, B, D, E, G, H), pp. 82-83; Riparian setback ordinance 3.010 (6)(D); 3.020 (6)(D).

Location: Upland game bird and waterfowl habitats are both specific (Irrigon WMA, Coyote Springs WMA, Umatilla National Wildlife Refuge) and general (county-wide). The three natural areas are protected by the federal government (2A). ODFW's Habitat Protection Plan also identifies riparian areas as Sensitive Upland Game birds and waterfowl habitat areas (p. 16).

Conflicting Use: Habitat diversity is the key to providing optimum upland game bird populations. Any land use that changes the characteristics of riparian areas, inundates large expanses of sage brush-grassland areas or reduces the diversity in the forest areas will adversely affect the population and production of upland game bird species in Morrow County. Modern farming practices of utilizing the maximum amount of land, such as removing brushy areas, wood lots and riparian vegetation, can only reduce habitat that is needed by upland game birds. Overgrazing or improper logging techniques on large blocks of land in the foothill and forest areas will remove habitat needed for optimum populations of upland game birds in those areas.

Areas that provide resting and feeding areas for wintering waterfowl in Morrow County should be considered important habitat areas. Land use activities that destroy wetlands, marshy areas, riparian areas or disturb resting areas will adversely affect waterfowl habitat.

Zone	Outright and Conditional Uses that Constitute Conflicts in Sensitive Habitat Areas
EFU	Agricultural practices, farm and non-farm dwellings, buildings, aggregate extraction.
SF-40	Agricultural practices, residences, buildings, aggregate extraction.
FU	Timber harvesting, residential development, airports, aggregate extraction, processing plants.

MG Service buildings and establishments, farming, residences, airport, manufacturing facilities.

Economic, Social, Environmental, Energy and (ESEE) Considerations

Economic Impacts: Upland game birds and some waterfowl are managed for hunting activity. Revenues associated with hunting can be considerable. Gross economic impact for Morrow County game bird hunting in 1977 was \$352,000; that for waterfowl was \$105,000.

Social Consequences: Social consequences of permitting conflicts include decreased hunting activity (for lack of birds).

Environmental: Upland game birds and waterfowl are part of the local ecosystem. The impact of reduced numbers of birds, resulting from habitat loss, has not been determined.

Energy: Conflicts between wildlife habitat and energy conservation are vague. Impacts would not be significant.

Program to Achieve the Goal: The Goal is achieved through federal administration of public land, the federal Migratory Bird Act, County resource zoning and riparian setbacks and vegetation standards of the SR zone on private land.

Goal 5 Designation: Upland game bird and waterfowl habitats located on public land are accorded a 2A designation (i.e., no conflicting use). Those riparian habitat areas located on private land are accorded a 3C designation (specifically limit conflicting use) subject to the SR zone. County resource zoning (EFU and FU) provides adequate protection for remaining "county-wide" habitats.

Riparian Habitat - 2A/3C

References: Plan, pp. 74, 75; Fish and Wildlife Protection Plan for Morrow County (ODFW, 1979); Wildlife Habitats in Managed Rangelands -- the Great Basin of Southeast Oregon, Riparian Zones (PNW for. and Range Exp. Stn., USFS, USDA, For. Ser. 1979).

Location: ODFW's Protection Plan for Morrow County recommends protection of riparian vegetation. Riparian vegetation can be identified by the presence of vegetation that requires free or unbound water or conditions that are more moist than normal. For purposes of implementation, riparian habitat in Morrow County are areas identified by ODFW as Sensitive Upland Game Bird Habitat (Fig. 3) along streams and Sensitive Fish Habitat (Fig. 1) (Protection Plan for Morrow County (ODFW, 1979). Ponds, lakes, and wetlands identified as sensitive habitat areas are also considered as having riparian habitat.

Definition of Riparian Habitat Area: Riparian habitats vary depending on the type of water source. But in general, they are identified by the presence of vegetation (generally more productive in terms of biomass-plant and animal - than the remainder of the area) that requires large amounts of free or unbound waters.

Conflicting uses: Any use which disturbs the microclimate, vegetation structure and composition, and water quality and quantity. Most riparian habitat in Morrow County is located on agricultural land and zoned EFU. Specially, the conflicting uses are: road construction; campgrounds, mining and any use which impacts water quality and

quantity (including temperature); results in the loss of vegetation diversity; or impedes the movement of wildlife from one habitat to another. In some cases, improper agricultural practices (i.e., overgrazing) impacts riparian habitat.

ESEE Consequences: Riparian zones are disproportionately important to many uses including uses which may conflict with the resource. The relative gentle topography, particularly in areas otherwise rugged topography, makes riparian zones attractive for road construction. Recreationalists concentrate their use in such areas. Streams, rivers and their banks are also handy sources of rock and gravel for constructions. On the other hand, riparian habitat protection is not only important to wildlife but is necessary to maintain water quality which benefit all users. Water is increasingly becoming more important particularly in dry climates. Riparian management may increase initial cost of certain projects, but water quality and quantity degradation and the loss of dependent wildlife will have short and long range impacts on the entire County. The economic and energy input of addressing this issue first is much less than the economic and energy input required to restore disturbed areas. The social consequences of water degradation is obvious. The consequences of the loss of wildlife dependent on riparian habitat are discussed throughout the text.

Program to Achieve the Goal: The Goal is achieved through federal administration on public land (2A decision), structural setback standards and riparian vegetation standards of the SR zone on private land (3C decision). For the propagation and harvesting of forest products on forest lands zoned for forest uses, the County will rely on the Oregon Forest Practice Act, Rules and supplemental agreements between State Board of Forestry and Oregon Fish and Wildlife Commission.

Washington Ground Squirrel - 2A

References: Wildlife Resources map (Sensitive Non-Game Habitat); Washington Ground Squirrel Study, Lewis and Clark College, 1979; Applicable policy; 5.(0), p. 82.

Location: The Washington Ground Squirrel, once thought to be extinct in Oregon, is still present in limited numbers in Morrow County. Their habitat is within the boundary of the US Navy Bombing Range near Boardman, Oregon.

Quality/Quantity: The Bombing Range is the only habitat known in Oregon. The site has been designated a research natural area and is supervised by The Nature Conservancy. The animal is rare and cannot survive in areas of intensive agriculture (Puget Sound Museum of Natural History, UPS, September 4, 1973. Letter contained in Lewis and Clark study).

Goal 5 Designation: The Boardman Bombing Range is public land administered by the U.S. Navy. The area has been accorded a 2A designation (no conflicting use).

Non-Game Birds and Mammals - 3C/2A

References: Plan, p. 74; Fish and Wildlife Protection Plan for Morrow County (ODFW, 1979); Applicable Plan Policies: (General), 1. (B, C, E-M) pp. 79-80, 5. (D, E, G, H).

Location; Quality/Quantity: Morrow County's non-game species includes a variety of hawks, owls, songbirds, shorebirds, and small mammals. The Washington Ground Squirrel, an endangered species, is treated separately in the County's Goal 5 analysis.

Conflicts: The habitat of non-game species coincides with that of big game, upland game birds, and furbearers (EFU, FU, SF-40, MG zones). Any activity that reduces or places stress on a wildlife habitat represents a conflict. Construction projects, pollution and human habitation are common conflicts.

Economic Impacts of Conflicts: The amount of time the public spends in observing non-game species has economic implications. In addition, non-game species are an important part of local ecosystems. The elimination of some species could have far reaching impacts on the county's economy.

Social Considerations: Observing non-game species is a popular past-time. The response of humans to wildlife management problems is sometimes emotional and well known. Any activity that poses a serious threat to some non-game species will produce a social reaction.

Environmental: Non-game species are an important link in local ecosystems. Any conflict must be assessed in terms of environmental impact.

Energy Considerations: Includes transportation to and from wildlife viewing areas.

Goal 5 Designation: Those riparian habitat areas located on private lands are accorded a 3C designation subject to the SR zone. Non-game species located within designated fish and wildlife management areas (e.g., Umatilla NWR, Coyote Springs WMA, Irrigon WMA) are protected (2A).

Protected Species: Bald Eagle (3C) and Golden Eagle Nest Sites (3C)

References: Wildlife Resource map; Cooperative Agreement document: Oregon State Board of Forestry and the Oregon State Fish and Wildlife Commission, February 1984.

Two bald eagle and five golden eagle nest sites have been identified in Morrow County and are identified on the SR zone map as sensitive bird sites.

Conflicting Uses: The principal conflicting uses would include tree removal, dwellings, mineral and aggregate extraction and roads. The economic impacts of conflicts discussed for non-game birds apply here.

Economic: The economic impacts of conflicts discussed for non-game birds apply here. In addition, these species have special importance because of their endangered status. The economic benefits of having present an endangered species is important to the County.

Social Impacts discussed for non-game birds apply here. In addition, the social benefits of having present an endangered species is important to the County.

Environmental: The eagle fills an important ecological niche. Impacts on the ecosystem, however, have not been determined.

Energy: Other than food chain considerations, there is no apparent relationship with energy or energy resources.

Program for Achieving the Goal: Eagles are protected by the federal Endangered Species Act. In addition, they are protected by state statute.

Goal 5 Designation: Bald eagle and golden eagle nests are accorded a 3C designation (protect the site by limiting conflicting uses). The SR Zone applied to the sensitive bird nest sites provides a 300 foot buffer.

Three-Mile Island - 2A: ODFW has identified Three-Mile Island as sensitive habitat for: Ring-billed gulls; Caspian terns, Black Crowned Nite heron and California gulls. Three-Mile Island is under federal ownership (Army Corps of Engineer) and has been designated 2A.

Osprey Nest Site - 2A (Private): The osprey nest site is located on a snag about 50 yards off shore Lake Penland. There are no conflicts associated with this resource (personal communication, Mark Henjum, ODFW, December 16, 1985).

Goshawk Nest and Prairie Falcon Nest Sites - 2A: Both of these nest sites are located on public lands (U.S. National Forest) and designated 2A.

Long-billed Curlew - 2A; 1B

References: Long-billed Curlew Study: Morrow and Umatilla Counties, 1976-77 (ODFW)

The Oregon Department of Fish and Wildlife (ODFW) has identified the long-billed curlew as a protected bird. The curlew prefers the County's rolling grassland for its nesting sites. Some birds nest in marginal areas defined by ODFW as "biscuit-scabland with small rocks" or "ridge tops that have few or no shrubs and grasses not more than 12 inches tall" (p. 50). These areas coincide with some exclusive farm use zones. Nesting, however, was not observed where farming exists, whether dryland or irrigated. Curlews gravitate to the irrigated areas after nesting and also feed in these areas during nesting (pp. 50-51).

The Department of Fish and Wildlife's '76-77 report identifies several preferred nesting areas. These include:

<u>Area</u>	<u>Ownership Management</u>	<u>Goal 5 Designation</u>
Quensel Park	Army Corps of Engineers	2A
Boeing Co. Lease	Boeing/State of Oregon	1B
Boardman Bombing Range	U.S. Navy	2A
Umatilla Natl. Wildlife	Bureau of Sport Fish & Wildlife	2A
Army Ordinance Depot	U.S. Army	2A

The report also notes the occurrence of curlew nests on private lands beside Boeing but is not site specific (1B).

Goal 5 Designation

Long-billed curlew nesting areas on federal land are accorded as 2A designation (no conflicting use). Nesting areas on private land also coincide with EFU land and are not site specific. They are accorded a 1B designation (i.e., some information is available but it is inadequate to identify the resource site). The 1B designation is supported by the Natural Resource (General) policy P.

Furbearers - 2A; 3C

References: Plan (ref.), Wildlife habitat map (depicting Irrigon WMA, Coyote Springs WMA, and Umatilla NWA). Applicable plan policies: same as those associated with other wildlife resources.

Location; Quality/Quantity: Furbearers are found throughout the County. Aquatic furbearers (e.g., beaver, muskrat, mink and otter) are generally associated with brushy streambanks. Terrestrial forms (e.g., skunk, bobcat, badger, and coyote) are found throughout the county in suitable habitat areas; food, cover, and water requirements are varied and similar to those for big game, upland game birds and waterfowl.

Conflicts: Any land use detrimental to big game, birds or waterfowl will also have an adverse impact on furbearers. They are primarily within the County's FU and EFU zones. Conflicts include houses, and agricultural and forest uses that would remove brush, especially streamside vegetation.

Economic Impacts of Conflicts: During 1984, pelts obtained in trapping in Morrow County amounted to \$5,300 (ODFW). Although not a large figure, the pelts did contribute to the county economy. Reduction of habitat would adversely affect trapping.

Social Consequences: Many local ranchers would favor the elimination of the coyote and perhaps other furbearers considered as pests. In this sense, loss of habitat might be beneficial economically. The social or aesthetic value placed on some of the furbearers, however, might exceed their cost to the ranching community.

Environmental: Furbearers fill an important ecological niche. Their impact on Morrow County's environment is probably substantial but largely unknown.

Energy: There is no clear association with energy expenditure or conservation.

Program to Achieve the Goal: The habitat of furbearers is protected through the County's wildlife policies, resource zoning (e.g., large minimum lot sizes in resource zones), and stream setbacks standards of the SR zone.

Goal 5 Designation: The three wildlife management areas are administered by federal or state government and designated 2A. Riparian habitat areas are designated 3C.

Fish Habitat - 3C

References: Plan (pp. 74-76). Applicable policies: 3. A-C (p. 81); 5. A-C (p. 82); 5. G, p. 83; Fish and Wildlife Habitat Protection Plan for Morrow County (1979); Wildlife Resources Map; Zoning Ordinance requiring 100 feet setback from streams in EFU and FU zones.

Location; Quality/Quantity: Morrow County's sport fishery includes rainbow trout, large mouth bass, white crappie, summer and fall chinook, summer and winter steelhead, small mouth bass, sturgeon, brown bullhead, and brook trout. The Oregon Department of Fish and Wildlife has identified sensitive fish habitats, conflicts with those habitats, and has produced a protection plan in response.

Conflicts: There are a number of conflicts. Some pertain to all fish; other conflicts pertain to specific fish. General management strategies include maintaining adequate stream flow,

stream-side vegetation (see: Riparian Habitat), insuring fish passage and preventing any activity that seriously affects water quality. Any action that interferes with these strategies is a conflict. Conflicts are most likely to occur in EFU and FU zones. These include removal of stream-side vegetation or water pollution associated with farming or forest practices.

Economic Consequences of Conflicts: In 1975, there were 8,615 angler days in Morrow County. The economic value of rainbow trout, water species and sturgeon amounted to \$92,355 (ODFW statistics). Value for all fish is most significant. Conflicts, however, must be considered on a case-by-case basis. In some instances, conflicts may be mitigated and contribute more to the economic welfare of the county than the intrinsic value of the fish.

Special Considerations. Fishing is a favorite American past-time and a deeply ingrained part of the American lifestyle. Any action that would seriously affect this activity would probably be considered as unacceptable. There are also economic factors. Many people depend on sport fishing for their livelihood.

Environmental. Fish are a link in the food chain and an important part of local ecosystems. Care must be taken to avoid harmful and especially irreversible actions.

Energy Consequences of Conflicting Use. Energy considerations cover a wide range of scenarios. There are biological considerations (e.g., food chain) and those associated with man's activities (e.g., construction, transportation). Each conflict must be addressed on a case-by-case basis.

Program for Achieving the Goal: The retention of stream-side vegetation is addressed through the County's riparian vegetation/wetland standards of the SR zone. Water quality programs are administered by the state Department of Environmental Quality. The Department of Water Resources administers water permits.

Goal 5 Designation: Some conflict with fish habitat is probably unavoidable. It would be impractical to prohibit any land or water use that may have a short-term detrimental impact or that can be mitigated. It is prudent, however, to specifically limit conflicting use: 3C.

Ecologically and Scientifically Significant Natural Areas

References: Plan, pp. 76-77; Applicable plan policies (General), pp. 79-80; Land-Use policies pp. 80-81; Fish and Wildlife policies, pp. 82-83; Scientific - Cultural Resource policies, p. 83.

Location; Quality/Quantity: Morrow County contains several unique scientific/natural areas. These areas have been inventoried by the county and The Nature Conservancy. Ownership is either public or private. In some cases, the federal government retains ownership but has entered into a management agreement with another agency (e.g., state; private. Note table below). The Nature Conservancy has listed 13 natural areas in Morrow County and has prepared reports for four of the sites (Boardman Bombing Range, Botanic Site: Umatilla National Wildlife Refuge, Eight-Mile Grassland, and Sand Hollow Grassland).

The federal government owns an additional four natural areas in Morrow County: Umatilla National Wildlife Refuge, Boardman Bombing Range, Coyote Springs Wildlife Management

area and Irrigon Wildlife Management Area. The US Navy administers the Boardman Bombing Range and maintains a management agreement with The Nature Conservancy for portions of the range. Coyote Springs and Irrigon WMA are leased to the State of Oregon. Federal and state-managed land have been accorded a 2A designation (no conflicting use).

GOAL 5 - ANALYSIS (SUMMARY)

Goal 5 Area/Site	Ownership	Designation	Remarks
Boardman Bombing Range	Federal	2A	Management agreement with the Nature Conservancy for portions of the range.
Umatilla National Wildlife	Federal	2A	Contains special botanic area identified by The Nature Conservancy.
Coyote Springs Wildlife Management Area	Federal	2A	Long-term lease to Oregon Department of Fish and Wildlife.
Irrigon Wildlife Management Area	Federal	2A	Long-term lease to Oregon Department of Fish and Wildlife.
Plant fossils	Federal	2A	Extensive geologic formation within national forest.
Sand Hollow Grassland	Private	1B	Identified by The Nature Conservancy. EFU zone. Additional information needed.
Eight Mile Grassland	Private	1B	Identified by The Nature Conservancy. EFU zone. Additional information needed.
Three-Mile Island	Federal	2A	Sea bird colony. Identified by The Nature Conservancy.
La Fevre Prairie	Private	1B	Wildflower area; historic features. Identified by The Nature Conservancy. FU zone. Additional information needed.
Service Canyon	Private	1B	EFU zone. Bluebunch wheatgrass-Sandberg's Grasslands bluegrass. Additional information needed.
Gene Wood Creek	Private	1B	Grassland identified by The Nature Conservancy. EFU and FU zones. Additional information needed.
Houselog Creek Grassland	Private	1B	Grassland identified by The Nature Conservancy. FU zone. Additional information needed.
Rhea Creek	Private	1B	Western brook lamprey identified by The Nature Conservancy. FU and EFU zones. Additional information needed.

Boardman Bombing Range - 2A

References: County resource maps.

Location; Quality/Quantity: The 73 square mile Boardman Bombing Range is unique in several respects: (1) The range contains relict grassland communities (i.e., native grasses undisturbed by agricultural practices); (2) The range contains the only known colony of Washington Ground Squirrels in Oregon; and (3) The range contains a portion of the Oregon Trail and an historic cemetery. The US Navy administers the range; part is used for bombing practice, part leased for grazing and part (3 separated parcels; A, B and C) managed as a Natural Research Area (NRA).

Goal 5 Designation: The Boardman Bombing Range is administered by the federal government. It has been accorded a 2A designation (no conflicting use).

Federal/State Wildlife Areas - 2A

References: Plan, p. 76; Map of Wildlife Resources; Map of Identified Natural Areas (The Nature Conservancy); Morrow County Natural Resources (The Nature Conservancy). Applicable plan policies: (General Policies) pp. 79-80; (Fish and Wildlife) pp. 82-83.

Location; Quality/Quantity: There are three protected wildlife areas in Morrow County: Umatilla National Wildlife Refuge, Coyote Springs WMA and Irrigon WMA. Coyote Springs and Irrigon wildlife management areas are owned by the federal government but leased to the Oregon State Department of Fish and Wildlife. All three areas provide a habitat for waterfowl. In addition, the Umatilla National Wildlife Refuge contains a Great Blue Heron rookery and a variety of raptors, including bald and golden eagles.

Goal 5 Designation: The three wildlife areas are administered by federal or state government. They have been accorded a 2A designation (no conflicting use).

Scenic Views and Sites - 1B: Morrow County contains a variety of landscapes, many of which may be considered to be scenic. The County has not, however, designated any sites or areas as being particularly high in scenic-resource value.

Water Resources (General)

Morrow County's water resources include groundwater (3C), streams (3C), and ponds (2A). These resources are utilized for domestic, industrial, and agricultural purposes. In addition, streams and ponds are fish and wildlife habitats. Water requirements often result in conflicts. Problems which must be addressed by governing bodies include quality and quantity. Efforts to resolve or alleviate the problems are usually approached in the form of a project. Two projects would enhance the county's water resources: Snipe Creek and Stanfield-Westland.

The Snipe Creek and Stanfield-Westland projects are proposals to augment water resources in specific areas of Morrow and Umatilla counties. The Snipe Creek project would transmit water from John Day basin streams to the Butter Creek critical groundwater area. Stanfield-Westland is comprised of several projects designed to replenish water now

committed to agricultural use. All projects are tied to Bureau of Reclamation funding. In short, the projects have been proposed for some time but depend on federal assistance. Forthcoming funds are speculative.

Wetlands - 2A

There are wetlands located on the Umatilla National Wildlife Refuge and Coyote Springs Wildlife Management area and are administered by federal and state government (see Natural Areas). Wetlands are designated 2A (Public Lands).

Groundwater - 3C; 2A

References: Plan (pp. 71-73), Water Resources map; Groundwater Report 30 (1984); applicable plan policies: 1 B (p. 79); G, H, L, M (p. 80); 1 B-E (p. 81); 3 A-C (p. 81); D-E (p. 82).

Location; Quality/Quantity: Groundwater is essential to the development of Morrow County and its occurrence is fairly well understood. Water use is administered by the Oregon Department of Water Resources through a permit system. The Butter Creek critical groundwater area has been analyzed (Groundwater Report 30, 1984) and depicted on the Water Resource Map. Groundwater is used for domestic and agricultural purposes.

Conflicting Use: A conflicting use is one which, if allowed, could negatively impact groundwater resources. The County is concerned with two aspects: quantity and quality. Groundwater underlies the entire County and consequently all of its land use zones. Although conflicts are inevitable, they can be minimized through conservation programs and water pollution standards.

Zone Typical Conflicting Uses (Outright and Conditional)

Zone	Typical Conflicting Uses (Outright and Conditional)	
EFU	Depletion:	Irrigation, domestic, ag processing
	Pollution:	Ag practices; domestic
SF-40	Depletion:	Irrigation, domestic
	Pollution:	Ag practices, domestic
FU	Depletion:	N.A.
	Pollution:	Forest practices (timber harvest; spraying)
MG	Depletion:	Irrigation, industrial use
	Pollution:	Industrial use

Economic, Social, Environmental Energy (ESEE Considerations)

Economic Considerations: The recharge area is broad. Most of it is zoned for resource use (e.g., farm and forest). Low water tables brought about by excessive pumping and/or development result in added cost to water users. Added costs are associated with new well drilling and the extraction of water from deeper levels.

Social Impacts: Low water tables affect residential densities, industrial use, and farm practices. The movement of people to another area is one of the social consequences.

Environmental: Impacts associated with low water tables include the destruction of springs and wet areas.

Energy: Low water tables require additional energy to pump from lower levels and/or the transportation of water from other sources.

Program to Achieve the Goal: Two state agencies are charged with maintaining the state's water resources: Department of Water Resources and the Department of Environmental Quality. Control is accomplished through a permit system. It is important that the County implement a program that will insure water quality and quantity.

As policy, the County will consult with the Department of Water Resources and the Department of Environmental Quality before taking any action that directly affects ground water quantity and quality.

Goal 5 Designation: Groundwater resources constitute a system; they occur on public and private land. Land use activities at higher elevations of the watershed (usually public land) affect groundwater at lower elevations. Conflicts, then, do occur on public land. Although public land is not regulated by local government, a 2A designation (no conflict) is inappropriate. The County's groundwater resources have been accorded a 3C designation--recognizing that conflicting uses are inevitable but controllable.

Water Resources (Streams and Ponds) - 3C

References: Plan (pp. 71-73); Water Resources Map; Wildlife Resources Map (sensitive fish habitat areas); Applicable plan policies: 1 B, G, H, J, L, M (p. 80); 3 A-D (p. 82); Fish and Wildlife Habitat Protection Plan for Morrow County (1979).

Location: Morrow County recognizes the need to protect its water resources (Plan, p. 71) and has adopted conservation policies. In adopting the Fish and Wildlife Habitat Protection Plan, the county has insured the protection of ponds and wetlands:

Pond/Wetland	Zone	Remarks	Goal 5 Designation
Boardman Ponds	EFU	Public Land	2A
Cutsforth Pond	FU	Public Land (County Park)	2A
Pendland Lake	FU	Public Land (County Park)	2A

Morrow County's principal streams include:

Columbia River and tributaries:

Willow Creek	Balm Creek
Sand Hollow Creek	Rock Creek
Butter Creek	Six Mile Creek
Johnson Creek	Eight Mile Creek
Rhea Creek	Matlock Canyon Creek
Hinton Creek	Service Creek
Clarks Canyon Creek	

Tributaries of the John Day River:

Wall Creek
Ditch Creek
Skookum Creek

Potamus Creek
Matlock Creek

Conflicting Uses: Conflicting use constitutes any activity that would diminish water quantity or quality. This includes, but is not limited to residential and industrial development. Improper farm or forest management can also be detrimental.

Economic: Maintaining water quantity and quality is costly. The cost of correcting damage to streams and ponds may be greater. Clean-up and rehabilitation costs are passed on to the consumer/taxpayer.

Social Consequences: The loss of sensitive streams and wetlands is detrimental to the ecosystem and constitutes a social cost as well (e.g., wildlife enjoyment).

Environmental: Environmental costs include the loss of fish and wildlife habitat.

Energy: There are energy costs associated with stream/pond clean-up and/or rehabilitation.

Program to Achieve the Goal: Morrow County insures pond (lake) and stream quality and quantity through plan policies, stream setback ordinance, resource zoning (e.g., EFU and FU), adoption of ODFW Fish and Wildlife Protection Plan, and state statutes governing water quality and quantity.

Goal 5 Designations: Morrow County's principal ponds are within public land. They are consequently accorded a 2A designation (no conflicting use). The principal streams are within EFU and/or FU zones. Most traverse public and private land. Conflicting uses are to be anticipated but also controlled, hence a 3C designation (specifically limit conflicting use).

Potential Dam Sites - 1A

References: Plan (p. 71, 154); Water Resources Map; Applicable plan policies; 1B (p. 79); 1 G, I, J, M, 2 A (p. 80); 2 C, E, 3 A, B (p. 80); D, E, (p. 81); 5C (p. 82). List of 24 sites in Table.

Location; Quantity/Quality: Three federal agencies have identified 24 potential dam sites in Morrow County. Targeted uses include irrigation, recreation, fish/wildlife and flood control (Table). None of the dams are economically feasible at this time (Plan, p. 81).

The potential sites are located in the county's EFU, FU and MG zones. One site is located within the Boardman Bombing Range (Water-Resources-Map).

Goal 5 Designation: Potential dam site locations have been mapped, studied, and rejected as infeasible. The dam sites are accorded a 1A designation.

Historical Areas, Sites, Structures, and Objects

References: Plan, pp. 76-78; Archeology map (on file in county planning department); applicable plan policies: 1. (I), p. 80; 7. (A-F), pp. 83-84, Historic Sites and Buildings of Morrow County, Historic Bridge Study (Oregon Department of Transportation).

Analysis. (1) Archeological Sites - 3A: Many sites are known and others are suspected. The location of sites is confidential to insure their protection. The University of Oregon maintains a file which describes each site. Morrow County also has this information and a location map prepared by the university.

Conflicts: Any activity which alters the site constitutes a conflict--construction activities being the most common. Sites are also damaged or destroyed by some construction activities, timber harvesting, water impoundments, etc. Conflicts include construction of buildings, roads or streets that require excavation, mining activities (e.g., sand and gravel); virtually any activity that requires excavation.

Economic Considerations: It is difficult to place economic value on archeological sites. Construction projects financed wholly or in part by federal funds require an archeological investigation. If the investigation reveals significant finds, the project may be delayed until a proper excavation has been completed.

Social Impacts: The loss of archeological sites through negligence or vandalism is a loss of a national heritage. Those non-renewable resources are protected by state and federal law.

Environmental Impacts: The investigation of archeological sites is standard procedure in the preparation of environmental impact statements.

Energy Considerations: The destruction of archeological sites has no conventional tie with energy conservation or expenditure.

Program to Achieve the Goal: Archeological sites are a natural heritage and are protected by state and federal law. Goal 5 designation: 3A for known sites. Suspected sites: 1B.

(2) Historic Structures: Historic structures outside corporate city limits include:

<u>Structure</u>	<u>Goal 5 Designation</u>	<u>Remarks</u>
Emigrant Graveyard/ Station Ruin	2A	Within boundary of Boardman Bombing Rg
Cecil General Store	3C	Private Property. EFU zone. State Hist. Pres. office list
Rhea Creek (Spring Hollow) Bridge	3A	ODOT Historic Bridge Study. Eligible for National Register.
Willow Creek Bridge	3A	ODOT Historic Bridge Study. Eligible for National Register
Hardman Townsite	1B	Early townsite 1870, ODOT inventory

Rationale for Goal 5 Designations

(1) Emigrant Graveyard/Stage Station Ruin: Is within the boundaries of federal property (i.e., federal jurisdiction). There are no conflicting uses. The sites have been accorded a 2A designation.

(2) Cecil General Store: Is private property and is used for what it was intended. The store is on the State Historic Preservation office list and subject to county historical resource policy and ordinances.

Conflicts: Any action that would alter or destroy the store.

Economic Impact of Conflict: Although the structure is now empty, alterations may be desired at some future date. Economic impacts of allowing the conflict may be positive. Alterations may be essential for reopening the store. Although of local historical interest, the store is not a tourist attraction.

Social Impacts: Any diminution of our national heritage constitutes an adverse impact on the social environment.

Environmental: No significant environmental impacts.

Energy: No significant impacts are associated with energy conservation or expenditure.

Program to achieve the Goal: Historical structures and sites are protected through County Historical Resource policies (pp. 83-84) and the Historic Buildings and Sites Ordinance (Zoning Ordinance Section 3.300).

(3) (4) Rhea Creek Bridge and Willow Creek Bridge Near Cecil: Have been identified by the Oregon Department of Transportation (ODOT) as historic bridges--worthy of preservation. They are included in that agency's study of historic bridges and eligible for the National Register of Historic Places (5-2-85). ODOT's Environmental Section encourages protection of the bridges because of their architecture and historic significance. Preservation of the bridges would not interfere with necessary bridge replacement. ODOT suggests that the bridges be moved just off the present alignment or relocated in a county park.

Conflicts: The historic bridges serve important stream crossings. They are dated (1909) and should be replaced. The most obvious conflict is destruction of the bridges and replacement with new structures. Bridge dismantlement and storage is another option, but less desirable than keeping the bridges in tact. The Environmental Section believes this will ultimately result in bridge loss as parts are displaced, carried away, etc., over a period of time. They may ultimately be considered as just "junk".

Economic Considerations: The bridges are old and should be replaced. Preserving the bridges in tact will require some expenditure. The cost of moving the bridges can probably be financed with FHWA (Federal Highway Administration) dollars. Other financial obligations (e.g., site, maintenance) have not been determined. There is some indication that bridge removal and relocation may be as economically feasible as bridge destruction (ODOT Environmental Section, June 1985).

Social Impacts: There is nationwide interest in historic bridges. The loss of these bridges constitutes a loss in national heritage.

Environmental Impacts: The principal environmental impacts are social. The impact of bridge removal to some other location has not been determined. Bridge replacement is necessary to insure highway safety.

Energy: Dismantling or destroying the bridges requires an expenditure of energy. Bridge relocation also constitutes an energy expenditure. No comparative study has been undertaken but will be required in the preparation of an environmental impact study.

Achieving the Goal: The County insures the protection of the Rhea Creek and Willow Creek bridges through Historical Resource Policy G.

(5) Hardman Townsite - 1B: Located 20 miles southwest of Heppner along Highway 207. Early townsite (1870). This area has potential as an historical district. However, additional information is needed. A "1B" designation is applied to the entire Hardman townsite.

(3) Historical Trails, Campgrounds and Battlefields: Are primarily located in the northern portion of the county. They are:

<u>Historical Site/Area</u>	<u>Goal 5 Designation</u>	<u>Remarks</u>
Oregon Trail: Wells Spring segment	2A	Fenced. Located within the Boardman Bombing Range
Willow Creek Campground	2A	Private Property (Homestead)
Cayuse Battlefield	2A	Fenced. Monument and plaque.

Rationale for Goal 5 Designations

(1) Oregon Trail: Wells Spring Segment: This portion of the Oregon Trail contains visible wagon ruts. It is fenced and within the boundary of the Boardman Bombing Range. Designation: 2A (No conflicts).

(2) Willow Creek Campground (Near Cecil): Was used by travelers along the Oregon Trail. There are no distinguishing features. The campground site is part of a private homestead.

Conflicts: The campground site is within an agricultural section of the county. Homesteads and crop land usually occupy flats along stream courses. Although land use may change, the character of the land will most likely remain the same. The campground site is under private ownership and no conflicts anticipated. Designation 2A (no conflicts).

Energy: There are no significant impacts associated with energy conservation and expenditure.

(4) The Cayuse Battlefield Site: Covers all undetermined area. It is marked by a monument and plaque. No conflicting uses have been identified. The monument is "protected" as "historical".

Findings

1. Land Resources

- A. A 1974 survey by the Columbia-Blue Mountain Resource Conservation and Development Project, State of Oregon, shows the general land use in the County. Exclusive of residential areas, the County is roughly divided into 1/2 range land, 1/4 crop land and 1/4 forest land. As the County develops, competition for land increases, driving up land prices and creating a precarious balance in the ecological use of land. Proper land use planning at this point should alleviate the economic pressures forced on this limited resource.
- B. Solid waste disposal facilities are felt to be inadequate to serve both city and county needs. One County land fill site exists but only on a limited basis. A Hermiston firm provides services to two of the cities. Several illegal dumps are located within the County and are recognized by the D.E.Q. as a public health threat.
- C. Wind and flood erosion have been serious problems in Morrow County in the past.
- D. The presently most valuable mineral resource (other than soil) is construction and road aggregate, both crushed gravel and round rock and soil.

2. Water Resources

- A. Water quality within Morrow County is good and remains within D.E.Q. standards.
- B. Degradation of water quality in Morrow County streams and ground reserves could adversely affect municipalities by reducing acceptable water supplies or by requiring improved or larger water treatment facilities.
- C. Timber harvest activities and road building are the major contributors to water quality degradation on the upper reaches of Morrow County streams, while animal wastes, and industrial discharges may be the major contributors to water quality degradation to the lower reaches. Septic systems are probably the major causes of groundwater quality degradation in and around communities.
- D. Water resources are vital to the County's growth and development.
- E. Stream floods in Morrow County are characterized by "feast or famine" situation. Flood flows can occur in late winter or early spring from rapid snow melt on frozen soil from intense summer convection storms. Many of these streams will have little or no flow by late summer or early fall. These conditions are detrimental to in-stream water quality criteria such as siltation, stream bank erosion, and elevated water temperatures. Other uses which include municipal needs, fisheries and wildlife, recreation, irrigation, and livestock are also adversely affected.

Natural Resource Policies

1. General Policies

- A. All sites designated in the Goal 5 inventory shall be protected and managed so as to preserve their original character and/or public benefit.

- B. Where conflicting uses are identified and cannot be mitigated; economic, energy, environmental and social consequences shall be evaluated in determination of use designation.
- C. Agriculture, forest, open space, and recreational uses shall be considered consistent with natural and scenic values dependent on resource carrying capacities.
- D. Outdoor advertising signs as described in ORS 377.710 (23) shall only be permitted within commercial and industrial zones.
- E. Designated natural, scenic or buffer areas shall serve a valid public purpose and property owners should be duly compensated for the right of public use if deemed justifiable. Compensation can be in various forms including tax differentials, development densities transfer, market value reimbursements, public-private exchanges, etc.
- F. It shall be the policy of the County to conserve open space and protect natural and scenic resources.
- G. It shall be the policy of the County to maintain and improve the quality of the air, water, and land resources of Morrow County.
- H. It shall be the policy of the County to consider the carrying capacities of all affected natural resources in development proposals and to not permit any development which exceeds said capacities.
- I. The County shall continue in its efforts to identify open spaces, scenic and historical areas, and natural resources which should be preserved from urban or other development.
- J. County policy as expressed in other elements of the Comprehensive Plan shall recognize the present importance of resource conservation and potential economic significance to Morrow County of the relatively undegraded environment, as well as the benefits to the health, welfare and productivity of its residents of living and working in clean, orderly developed and naturally attractive surroundings. This will require close coordination with conservation programs of the USDA, County extension agency and private landowners.
- K. The County shall emphasize the preservation of open space and provisions for such open space in private developments shall be set forth as deemed necessary and in the public interest.
- L. To limit all discharges from existing and future developments to meet applicable state or federal environmental quality statutes, rules and standards.
- M. To establish a policy of analysis of requests for zone changes, use permits and the like to determine their affect on air, water, and land quality.

- N. The Fish and Wildlife Habitat Protection Plan for Morrow County (1979) prepared by the Oregon Department of Fish and Wildlife is hereby adopted by reference as part of the Morrow County Comprehensive Plan.
 - O. Morrow County recognizes that the long-billed curlew is a protected bird. Nesting habitat located on public land is protected by state and federal statutes. As policy, the County encourages these governments to properly consider long-billed curlew habitat when preparing land use plans for their respective properties. The County also recognizes that curlew habitat exist on private land; however, there is not enough information to support adoption of site specific protection measures. As policy, the County will examine information as it becomes available and determine whether nesting sites should or shouldn't be protected. The nesting sites of the long-billed curlew will be considered during periodic review along with other Goal 5 resources.
2. Land Resource Policies
- A. The County shall conserve land resources in the manner most supportive of the County's economic base.
 - B. The County shall recognize the predominate need for the maximum preservation of land for agricultural and forestry uses.
 - C. All land use policies and programs shall be designed to minimize land use conflicts and to maximize conservation and utilization.
 - D. Current land use patterns shall be a major factor of consideration in development decisions.
 - E. The County shall encourage and support land resource management and conservation programs.
 - F. The County shall encourage farmers to reduce attrition of topsoil through wind and water erosion control measures such as planting wind break cover crops, practicing new no-till agricultural techniques, and best management practices.
 - G. The County, using the provisions provided in both the Natural Resources Element and the Goal 5 Analysis, shall protect to the best of its ability significant aggregate and mineral mining sites throughout the County. (MC OR-1-2013)
3. Water Resource Policies
- A. County government shall work with appropriate agencies (EPA, SCS, U.S.F., County Extension Agent) to promote maintenance or enhancement of water quality in streams and ground reserves, especially the 208 Water Quality Program. The County should encourage best land management practices which minimize agricultural chemical run-off and soil erosion.
 - B. The County shall encourage and support the construction of multi-purpose impoundment reservoirs in the headwaters of stream systems to store water

during periods of excessive run-off and help reduce the problems caused by high flows and at the same time provide stored water which can be used to supplement flows during low flow periods.

- C. It shall be the policy of the County to encourage and cooperate in programs for the application of stream corridor management systems which include mechanical, vegetative, and management practices such as rock rip rap and jetties. fencing, grass seedings, shrub plantings, and debris removal will help re-establish a suitable riparian zone.
 - D. The County shall emphasize programs for improved irrigation management and efficiencies designed to reduce runoff and possible stream pollution, increase yields, make possible a wider selection of crops, reduce problems with roads, help reduce the increasing vector control problem, and make more water available for additional uses.
 - E. The County shall support all programs directed at attaining additional water sources and allocations for prime users in the County.
 - F. Where information is available, county shall take into consideration the quality and quantity of groundwater resources, prior to approving projects or developments that would impact those resources.
 - G. The County will consult with the Department of Water Resources and the Department of Environmental Quality before taking any action that directly affects groundwater quality or quantity.
4. Air Resource Policies
- A. The County shall consider the impacts of air quality in evaluating the desirability of new industries and economically significant activities, as well as the potential for development of Morrow County's air conditions offer industries and power plants faced elsewhere with problems relating to already over-exploited airsheds.
 - B. No development shall be permitted which will not meet applicable air quality standards.
5. Fish & Wildlife Policies
- A. The County shall seek to protect its fish and game resources.
 - B. The County shall cooperate with private landowners and with responsible state and federal agencies to preserve the quality of fish and wildlife habitat in the County, and should encourage the development of planned recreational sites such as Penland Lake and the Irrigon Marina in order to increase the local circulation of recreational dollars and create employment opportunities in service industries.
 - C. The County shall ensure that any future impoundments provide for the maintenance of the fisheries resource.

- D. All crucial wildlife areas shall be classified as exclusive agriculture, grazing, forest or open space, and protected whenever feasible by maintaining low densities at least 1:160 on both public and private lands.
 - E. To preserve valuable upland game bird habitat, urban sprawl and scattered residential use on agricultural lands shall be prohibited.
 - F. Road construction shall not occur except as deemed necessary in crucial deer, elk and antelope wintering areas. Off-road travels should be limited within crucial areas during winter periods.
 - G. Intensive recreational developments shall not locate within sensitive crucial habitat areas.
 - H. It shall be the policy of the County to encourage needed predator control programs.
6. Scientific - Cultural Resource Policies
- A. Where no conflicting uses have been identified, such resources shall be managed so as to preserve their original character.
 - B. Where conflicting uses have been identified, economic, energy, environmental and social consequences shall determine designation.
7. Historical Resource Policies
- A. Historical resources are non-renewable and shall be identified and preserved for future generations.
 - B. There shall be formulated and adopted a definitive set of standards pertaining to the preservation of historical resources, and such standards shall be utilized as guidelines in the review and approval of development proposals involving the alteration of historical resources.
 - C. The detailed historical inventory shall be retained on file in the appropriate location, however, such information shall not be disseminated to the public at large, but primarily retained for availability to local decision makers and historical researchers.
 - D. When no conflicting uses are identified, historic resources shall be managed in such a manner as to maximize the preservation of their original character.
 - E. Where conflicting uses are identified, the economic, social, environmental and energy consequences of the alternatives shall be evaluated in determining actual use decisions.
 - F. Property owners of designated historical resources shall be informed personally in order to preserve the individual's privacy from public trespass. Public fee acquisition, easement, preferential assessment, development rights acquisition or transfer, public-private exchange and other techniques should be investigated and utilized in maximizing preservation of endangered historical resources.

- G. The County will maintain its historic bridges as a resource. The bridges may be relocated or dismantled and stored until a suitable site is found for their permanent location.
8. Mineral Resource Policies
- A. At each plan update, the County will consider the status of mineral resource inventories. When data are sufficient, the County will complete the Goal 5 process as specified in OAR 660 Division 23. (MC OR-1-2013)
 - B. Aggregate mining operations are recognized as a valuable County resource and should be protected, as appropriate, in order to preserve the resource. (MC OR-1-2013)