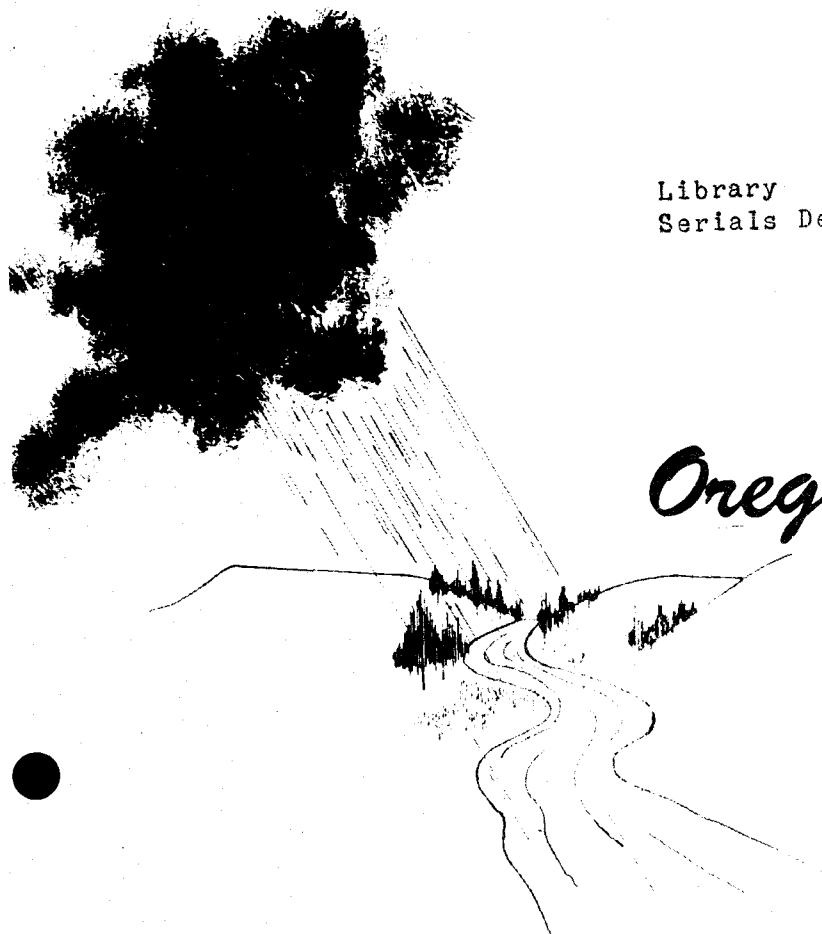


FD172  
37  
0.35

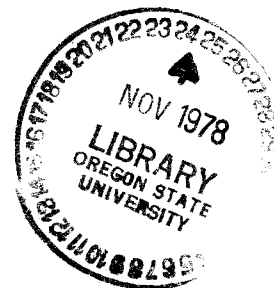
# PRONG BINDER

Oregon State University  
WATER RESOURCES RESEARCH INSTITUTE  
Covell Hall 115  
Corvallis, Oregon 97331

Non-Profit Org.  
U.S. Postage  
**PAID**  
Permit No. 200  
Corvallis, OR 97331



Library  
Serials Dept.



## Oregon's Environment

November 1978  
Number 35

### COLUMBIA RIVER MORATORIUM

In case you missed it during the hectic rush by Congress to adjourn, the waters of the Columbia River have been put "off limits" to all who would seek to divert the flow elsewhere. A new 10-year moratorium on diversion of the Columbia was passed and President Carter is expected to sign the bill. Actually, it was tacked on as an amendment to dam safety legislation. Senators for the Southwest objected, but Senator Henry M. Jackson of Washington prevailed.

The amendment will keep other regions from having even the authority to study possible diversion plans.

Malcolm Karr, director of planning for the Pacific Northwest River Basins Commission, said the moratorium "just eliminates our need to devote a large proportion of our energy on defensive measures. We can use our efforts to find the best use of the resources in the region." He added: "All the information we are developing shows that diversion is probably unwise."

Cont. →

Significantly, the Colorado River Board of California went on record earlier this year as unanimously opposing any federal studies on importing water from Columbia River Basin into Colorado River Basin. Action in mid-January came little more than one month after the Los Angeles County Board of Supervisors passed a resolution urging the federal government to develop a program to export Columbia River water into the Southwest. Colorado River Board's action included passage of a resolution which listed five reasons why Columbia exports are not feasible:

\* "Officials of Northwest states have declared that there is no surplus water in Columbia River Basin over needs of their states (for water supplies, hydroelectric power generation, navigation and fisheries).

\* "Costs of various proposals would be extremely high, with capital costs of several billions of dollars, and high annual costs.

\* "Energy demands would be high, costly and most likely could not be met.

\* "Environmental problems could be severe.

\* "Federal policy is evolving towards having beneficiaries pay most or all of water project costs. Agriculture, principal water user within Colorado River Basin, could not repay even small portion of the costs."

Wesley E. Steiner, executive director of Arizona Water Commission, agreed with resolution passed by CRB and added that anyone who talks about importing Columbia River water "at this time in history is kidding himself. Even if it were politically feasible, it wouldn't be economically." He said Arizona only has two ways to solve its water problems once its Colorado River entitlement is in use--by further augmenting water supply or by changing its water use habits. "I think I've made it pretty

clear that for the foreseeable future augmentation via the Columbia River... is not a very good prospect," Steiner said. "From now until the turn of the century, we have to learn to live with what we have."

\*\*\*\*\*

#### WATERSHED PLANNING

A study has been completed which develops a blueprint for a watershed management system, conceived for the South River Watershed in Virginia, that could be used in making decisions about the future development of any similar large (950 km<sup>2</sup> or 350 mi<sup>2</sup>) urbanizing watershed. The investigation first analyzes the complex problem of land-use planning and management, particularly the need for a comprehensive system providing long-term rational management and allowing achievement of complex human goals and objectives. Twenty-two tenets of land-use management are cited as fundamental to the design and implementation of such a system, and major phenomena that have obscured or halted comprehensive management efforts in the past are analyzed.

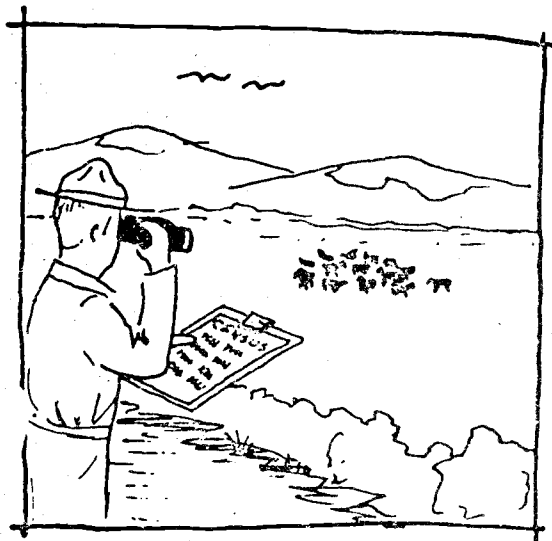
One part of this report discusses the "taking issue" and how it relates to the proposed system. Existing institutions, particularly the law, that influence land use are also analyzed. One new institution, a "watershed guidance center", is proposed. The study then describes an objective function that can be used as the basis for decisionmaking concerning a watershed. This complex expression is based on over 300 citizen-weighted objectives, each having a production function. Each production is expressed in net energy, for the total management system is energy-based and is related to probable change in physical and ecological systems.

(From "A Watershed Planning and Management System: Design and Synthesis", Bulletin 102, September 1977, Virginia Water Resources Center, Virginia Polytechnic Institute and State University, Blacksburg, VA 24060)

## OREGON RANGELAND COMMITTEE

The Oregon Rangeland Committee is composed of representatives from four federal, nine State and thirteen private organizations or interest groups. The goal of the Committee is to encourage and promote rangeland development, management, education, and research that will contribute to a healthy economy and a quality environment in Oregon. Over 60 percent of Oregon's land area is rangeland, pasture land and forested range, a high proportion of which is publicly owned and managed. The Oregon Rangeland Committee concerns itself with all ownerships of rangeland and fully recognizes that different policies and regulations govern management of public lands as contrasted with private ownership. Positions regarding rangeland uses and issues must be taken from time to time. Position statements were adopted by the Committee this year and are designed to serve as general guidance when issues arise. Management of water is one topic which concerns the Committee.

Water produced on range watersheds is an important contribution to food production and enhancement of resource value. Sound, modern grazing management



cannot occur unless water is supplied, naturally or artificially, in all grazing units. Development of water supplies on rangelands should be encouraged to obtain the widest range of beneficial uses without degrading the environment. Much water for Oregon agriculture and energy production originates on rangeland. Further development of the resource for this purpose is encouraged when economically, ecologically, and legally feasible.

The Committee recognizes the need for clean water and supports implementation of sound rangeland management practices which provide water quality necessary to protect and maintain the identified beneficial uses of water.

Rivers, streams, and associated riparian habitat are necessary to the production of anadromous and resident fish of high economic and recreational value to the State. The riparian area also provides a disproportionate share of valuable habitat for other types of wildlife. Management programs should recognize the need to maintain and improve these values.

\*\*\*\*\*

### OMNIBUS WATER RESOURCES BILL

Both the House and Senate has passed versions of an omnibus authorization bill containing numerous environmentally unsound water projects. Last-minute efforts to enact this legislation failed for lack of a quorum in the House of Representatives, immediately prior to the adjournment of the Congress.

## COLUMBIA RIVER WATER MANAGEMENT

The water resources of the Pacific Northwest are the Columbia River, its tributaries and the Coastal streams of Washington and Oregon. The Columbia River dominates the area from its ultimate source, Columbia Lake in Canada's Selkirk Mountain Range, at an elevation of 2,650 feet above sea level, throughout its course of 1,214 miles to the Pacific Ocean. Ranking 32nd among rivers of the world, and fourth in North America after the Mississippi, Mackenzie and St. Lawrence, it drains 259 thousand square miles ranging from semi-arid country with less than eight inches of rainfall a year to the coastal mountains where more than 100 inches fall annually.

The Columbia River Basin has many outstanding features and includes a wide variety of landscapes, climate, natural resources and scenic and recreational attractions. Abundant forests, agriculture and range lands, minerals and water stimulate the economy of the region. A great variety of fish and wildlife abound in the region. Wildlife species range from small fur bearers to moose, elk, deer and bear. Birds include quail, partridge, pheasant and a wide variety of water fowl, song and shore birds. Salmon and trout, the most popular sport fish, inhabit many of the region's waters.

Before man's development of the Columbia River, the water resources mainly provided habitat for fish and wildlife, with man living along the shoreline to utilize the available food sources and transportation routes. However, with the growth of settlement and industrialization, development of dams and storage reservoirs has taken place to meet the needs of a region in which the population has grown from approximately 2.8 million in 1933 to more than 7 million today. Projects on the Columbia and Lower Snake Rivers contain more than 43 million acre-feet of storage space, authorized primarily for hydroelectric power production and irrigation, navigation and flood control.

Special hydrologic and geographical features of the Columbia River Basin include extremely high annual runoff, silt-free water, and steep drops within a relatively short distance. These characteristics make the Columbia River especially well suited for many beneficial purposes, including hydroelectric power, irrigation, navigation, flood control, recreation and low flow augmentation for fish and wildlife and other uses. The resources of the Columbia are very valuable to the people of the region and the nation.

Reservoirs are normally filled during the peak flood season of April-August. Once conserved in the storage reservoirs, the water is then released during the period of September-March, with the greatest release occurring during the period of maximum power demands. Columbia River developments now supply an energy equivalent of 195 million barrels of oil annually.

Spring floods in the lower reaches of the river, once a menace to life and property are now virtually a thing of the past. Operation of dams in the Columbia prevent millions of dollars in flood damage.

Waters from the Columbia River system are used to irrigate nearly 8 million acres of highly productive farm land in the Columbia River Basin. This acreage represents about 4 percent of the total land area and 18 percent of the total

irrigable acreage. Small grains, potatoes, fruits, beet sugar, vegetables, grass seed, and hops are exported from the area in large quantities. Forage crops, hay, and pasture also support a large beef and dairy industry. The sale value of crops, livestock, and livestock products from the irrigated lands is estimated to exceed \$1 billion annually.

Navigation is an important function of the Columbia. It provides access for ocean-going commerce from its mouth to Vancouver, Washington, and Portland, Oregon. Commercial inland navigation on the Columbia extends to the Kennewick-Pasco-Richland area of eastern Washington and to Lewiston, Idaho on the Snake River.

In normal to high runoff years criteria are well established for operation of the reservoir system for flood control, and the water supply is adequate or more than adequate for irrigation, hydropower, and other uses. In 1977 the problem was "not enough" rather than "too much". In drought years the water is needed for everything except flood control, the water supply is inadequate for many of the needs, so operation for any one of the many uses will quite often conflict with other requirements.

Federal, State, and Local Government Agencies met frequently in 1977 to work out regulation of the water supply to meet the needs of all water users insofar as possible within legal limits and established rules. Conflicting interests were resolved by arbitration to benefit the people of the Northwest.

Some water which could have been stored in the reservoirs was released to aid juvenile salmon in their journey to the sea. Without this special release a large percentage of these downstream migrants would have perished in the slack water pools. Arrangements for the "Fish Flow 77" operation were developed by State and Federal agencies and approved by the Governors of the Northwest States.

All possible steps were taken to minimize the effects of lost hydropower resulting from "Fish Flow 77". Voluntary curtailment in the use of electrical energy by people of the Northwest helped to prevent a serious shortage. 1977 will be recorded as the year of the drought, but it should also be remembered as the year of cooperation and compromise.

Drought is a great reminder of our weakness in the face of the extremes of nature. Fortunately, these extremes also trigger the marvelous social capacity of our society for speedy and innovative actions -- actions to help reduce the impact.

(From "*Columbia River Water Management Report for Water Year 1977*", by Columbia River Water Management Group, January 1978)

\*\*\*\*\*

Traditionally, rain water has been collected in order to get pure soft water for hair washing, or for cooking and drinking. However, in urban areas the collection of rain water for human consumption may create special health problems. The levels of pollution may be so high in some areas that the lead content might reach dangerous proportions.

## LINCOLN COUNTY WATER SURVEY

Annual water use in the Lincoln County coastal area totals about 6.7 billion gallons (26 hm<sup>3</sup>), less than 0.5 percent of annual runoff. Of that use, 4.7 billion gallons (17 hm<sup>3</sup>) is diverted from the Siletz River and Olalla Creek for industrial use by the Georgia-Pacific Corp. mill at Toledo, and 0.33 billion gallons (1.2 hm<sup>3</sup>) is withdrawn from streams for irrigation of pasture and hay lands. Because of a trend away from farming in the area, irrigation use is declining and now may be less than the use reported in a 1964 report of the U.S. Department of Agriculture. Water for public supply, which totals about 1.7 billion gallons (6.4 hm<sup>3</sup>), is obtained principally from surface-water sources. In addition, small volumes of ground water are pumped from wells and used for mobile-home courts, parks, and private residences and farms.

Because of rapid development of the coastal area, additional water will be needed in the future. This water can be supplied (1) by reservoirs on major streams; (2) by expansion, in some locations, of present surface-water facilities on small streams; and (3) locally, by an additional small volume of supplemental water from ground-water sources.

### Surface Water

Lincoln County receives some of the highest amounts of precipitation in the State (60 to more than 200 in, or 1,500 to 5,100 mm). Most stream runoff occurs from November through April, and mean annual flows from Lincoln County streams emptying into the Pacific Ocean total 5,000,000 acre-ft (6,000 hm<sup>3</sup>). Intense storms are frequent and flooding occurs almost annually. The tight soil and rock formations and steep, rugged topography in some of the county cause rapid storm runoff. Because most of the water courses are relatively short, peak flows are produced within hours of the passage of a storm front. Most land development, other than reforestation or reservoir construction, will only cause more rapid runoff and greater flooding from streams. The very tight soil and rock formations in the area form poor aquifers; as a result, all large streams and most small streams in the county have very low summer flows, with dependable low flows ranging from 0.05 (ft<sup>3</sup>/s)/mi<sup>2</sup> [0.0005 (m<sup>3</sup>/s)/km<sup>2</sup>] from the Tye Formation at the Yaquina River station near Chitwood to 1.54 (ft<sup>3</sup>/s)/mi<sup>2</sup> [0.017 (m<sup>3</sup>/s)/km<sup>2</sup>] from Quaternary marine terrace deposits at Fox Creek near Waldport. About 1 percent of the annual runoff of most of these streams occurs during August and September.

Population growth will increase the need to use and impound more water from streams along the Lincoln County coast. The small streams adjacent to the coast can supply only limited water for increased domestic demands. Ultimately, large streams (such as the Siletz and Alsea Rivers) may have to be impounded, probably at their higher altitudes. With their summer flows augmented, the river water could then be pumped and treated at convenient locations.

Suspended sediment is probably one of the more objectionable constituents in the surface water of the coast. Mean annual loads of all streams studied in the project area ranged from 125 to 1,380 tons/mi<sup>2</sup> (70 to 780 tonnes/km<sup>2</sup>). It is estimated that for most coastal streams a suspended-sediment concentration of 10 mg/L is exceeded approximately 20 percent of the time. Sediment transport is highly variable, depending primarily on source material, water discharge, and land use.

## Supplemental Ground Water

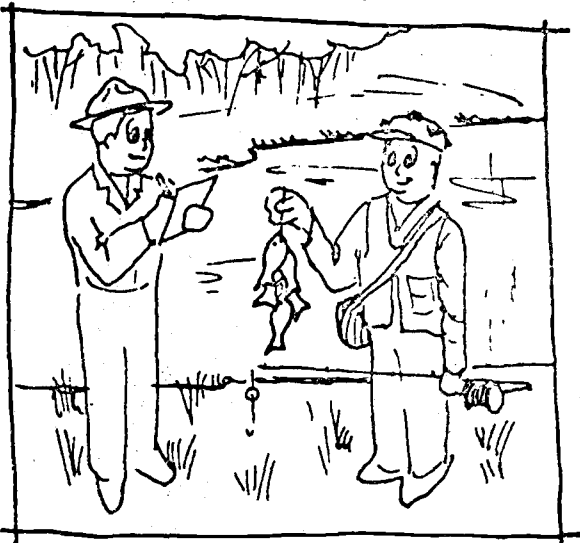
Because most of Lincoln County is underlain by sandstone and siltstone units of rather low permeability, large supplies of good-quality water adequate for municipal and industrial use are not generally available. However, ground-water supplies for supplemental use can be obtained in parts of the area underlain by volcanic rocks and marine terrace deposits.

(From "Water Resources of Lincoln County Coastal Area, Oregon", U.S. Geological Survey, 1977)

\*\*\*\*\*

### SALT MARSH STUDY

The Army Corps of Engineers has a contract with Oregon State University for research on the productivity of west coast salt marshes. The first phase in the project is a study of the fish and invertebrates in two Oregon marshes. The study is to be coordinated with the Corvallis Environmental Research Laboratory of EPA study of the productivity of the major marsh plants in Netarts Bay and Siletz Bay on the northern Oregon coast. These studies will provide information to aid in evaluating west coast marshes and comparing their productivity with east coast marsh productivity.



## A NEW BOOK

"LOW HEAD HYDRO" . . . Taps the expertise of a wide-ranging group of engineers, economists and government officials to examine all aspects of low-head hydroelectric production. Among the topics covered are:

- (1) The economics of specific low-head installations now on line.
- (2) The methodology used to determine the power potential of irrigation systems.
- (3) The complex government procedures concerning low-head.
- (4) Environmental and aesthetic considerations.
- (5) Marketing low-head power.
- (6) Economic analysis techniques for low-head projects.
- (7) Legal and institutional considerations.
- (8) The technology of tube, bulb, cross-flow and straflo turbines.
- (9) Potential sites.
- (10) The changing role of private utilities.
- (11) Federal low-head programs.
- (12) The legislation outlook.

And much more. (Compiled by John S. Gladwell and Calvin S. Warnick, Idaho Water Resources Research Institute, University of Idaho, Moscow, Idaho, USA, 83843. 1978. 206 pages, illus. \$10.00, postpaid.) Oregon WRRRI staff members contributed to the contents and compiling of the book.

## GROUND WATER PROBLEMS

The Oregon Water Resources Department recently designated portions of Umatilla and Morrow Counties as a critical ground water area. Approximately 274 square miles in the Butter Creek drainage near Hermiston are affected by the Administrative Order.

The action represents the culmination of years of investigation and studies of declining ground water levels in the area. Measured annual declines in the water levels have been as much as 10 to 20 feet in recent years. The Department began withholding approval for permits for new well development in the Butter Creek area in 1971. According to James E. Sexson, Director, the Order is necessary to stabilize the decline in water levels and to protect the limited resource and the prior rights of farmers who pioneered water development in the area.

Under the Order, the annual withdrawal of water will be limited to 27,000 acre feet per year beginning November 1, 1978. Restrictions on ground water use will be made on the basis of the dates of priority of the affected water rights. The curtailment could affect as much as 10,000 acres of irrigated land.

The Order also directs immediate installation of water meters and water level measuring equipment on all irrigation and municipal wells used in the critical ground water area. According to Sexson, it is possible that the ordered limitation will not be sufficient to stabilize the decline in water well levels and additional restrictions may be necessary in the future. He stressed that full cooperation by all users in the Department's measuring program will be required to properly evaluate the results of the continuing study and the need for future actions.

Copies of the Order have been mailed to all parties involved in the proceedings. The Order may also be examined in the office of the County Clerks in Umatilla and Morrow Counties or the office of the Watermaster in Pendleton.

There are four other critical ground water areas in the state. They are located in the Cooper Mountain-Bull Mountain area of Washington County, the Ordnance area of Morrow and Umatilla Counties, Cow Valley in Malheur County and in an area near The Dalles in Wasco County.

\*\*\*\*\*

## EXCESS LANDS

Regulations to enforce, for the first time in 76 years, the acreage limitation and residency requirements of the 1902 Reclamation Act were issued in draft form by the Interior Department in August 1977. The regulations were mandated by a U.S. District Court in response to a suit brought against the Interior Department by National Land for People, Inc. If enforced, farms receiving federal project water and holding lands in excess of the 1902 Act's limits would, among other things, have to sell the excess lands or forfeit their right to project water. Executive action has been postponed for approximately a year while the Department of Interior prepares an Environmental Impact Statement on the regulations.