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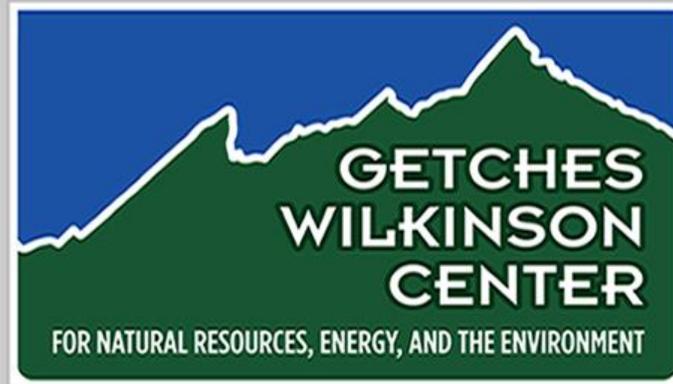
Ullman, Carl, "Klamath Basin: Balancing Instream Flows with Irrigation and Power" (1997). *Dams: Water and Power in the New West (Summer Conference, June 2-4)*.

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Carl Ullman, *Klamath Basin: Balancing Instream Flows with Irrigation and Power*, in DAMS: WATER AND POWER IN THE NEW WEST (Natural Res. Law Ctr., Univ. of Colo. Sch. of Law, 1997).

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**KLAMATH BASIN:
BALANCING INSTREAM FLOWS
WITH IRRIGATION AND POWER**

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DAMS: WATER AND POWER IN THE NEW WEST

June 2-4, 1997

**Natural Resources Law Center
University of Colorado
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Boulder, Colorado**

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Klamath Basin: Balancing Instream Flows with Irrigation and Power

by Carl Ullman

I. Summary

There are, roughly speaking, five water related interests making demands on the Klamath Basin water supply — fisheries and other natural resources, irrigated agriculture, wildlife refuges, hydropower generation, and recreation. These interests have historically operated more or less independently of one another, and Basin water management reflects that disparity.

Several factors have now combined to bring Basin water management issues to a head, and to require more integrated management. These include the drought of the early and mid-1990's, endangered species listings of three fish species as well as population declines in many waterfowl populations, continuing growth of the Basin's human population and irrigated agriculture, and a General Stream Adjudication being conducted by the Oregon Water Resources Department.

Six dams on the Klamath River mainstem and at least one other on a tributary stream have, for the first time, come under scrutiny regarding their effects on other Basin resources, particularly fisheries and agriculture. FERC relicensing proceedings, to be completed by 2006, will offer a forum to continue and to focus this process.

Water supply in the Basin is currently inadequate to meet water demand. The General Stream Adjudication is an inadequate tool to address this problem because it is a win-lose proceeding that can only effect a division of the existing supply among existing uses; it cannot consider supply augmentation, demand reduction, water quality problems, or habitat restoration measures. Various Basin interests have begun the search for a more promising, win-win, process that can address a wider range of Klamath Basin water

issues.

II. Competing water interests in the Klamath River Basin

- A. Both freshwater and anadromous fisheries thrived in the Klamath Basin historically. Commitments for fishery protection were made to Indian tribes as part of the process of securing land title from the tribes (e.g., Treaty with the Klamath, Moadoc, and Yahooskin Band of Snake Indians, 16 Stat. 707). During the period of agricultural and hydropower development, developmental uses were emphasized with very little attention paid to fisheries.
1. Freshwater fisheries include two species of fish in Upper Klamath Lake, known to the Indians as "c'wam" and "quapdo" and to the non-Indians as "suckers," that are now on the Endangered Species list. The fish are of enormous importance to the spiritual and physical well-being of the Klamath people and are treaty protected. The Lake also holds a trophy trout fishery. The Upper Basin also has bull trout, another species that may soon be listed as threatened or endangered.
 2. Anadromous fisheries include salmon and steelhead. They formerly ran throughout the Basin but are now restricted to the River below Iron Gate Dam. The coho run was listed as threatened on April 25 of this year. Anadromous fish are protected to at least three Basin tribes by treaty and executive order.
- B. Irrigated agriculture began in the Basin in the late 19th Century.
1. The Bureau of Reclamation's Klamath Project was authorized in 1905. It is the second oldest Project of its kind. It is located below Upper Klamath Lake and includes about 18 organized irrigation districts and 200,000 acres of irrigated land. It asserts that it requires 400,000 - 500,000 acre feet of water each year for maximum production. It adapts and manipulates Upper Klamath Lake, which is still in roughly its historic size and shape, to serve as the primary storage reservoir. For nearly 80 years the Project controlled the Basin water supply for the nearly exclusive

benefit of agriculture. Now the restrictions of treaty rights and endangered species concerns are beginning to be felt.

2. An important characteristic of the Project and the Basin as a whole is its limited storage capacity. Much less than one year's supply of water can be stored in Basin reservoirs.
3. Over 100,000 acre feet of water is exported from the Klamath Basin each year.
 - a. Up to 60,000 acre feet of water is exported from the Klamath Basin to the Rogue Basin each year for irrigated agriculture. Diversions at the crest of the Cascade Mountains take water from tributaries of Upper Klamath Lake and the Klamath River, transferring it to tributaries of the Rogue River.
 - b. The Lost River system is in the Great Basin immediately east of the Klamath River. The lower half of the Lost River Basin is dewatered by upstream diversions for agriculture. It is rewatered with out-of-basin diversions from the Klamath Basin.
4. Above Upper Klamath Lake water use is almost entirely by individual ranchers on a farm-by-farm basis. These diversions dewatered Klamath Forest National Wildlife refuge, giving rise to the leading water rights case in the Basin (United States v. Adair, 723 F.2d 1394 (9th Cir. 1983)).

C. There are five National Wildlife Refuges in the Basin; Klamath Forest NWR, Upper Klamath NWR, Tulelake NWR, Clear Lake NWR, and Lower Klamath NWR.

1. These areas are among the most important stopovers on the Pacific Flyway. As the Klamath Project began to dewater the area for homesteading, concern for the wildlife values rose, resulting in designation of specified NWR's and Kuchel Act requirements allowing only those agricultural activities on the NWR's that are "consistent with the major purpose of waterfowl management" (16 U.S.C. § 695(l)).
2. The NWR's water rights seniority is poor. They have subsisted for most

of their existence on agricultural return flows. In many years birds die of botulism exacerbated by lack of adequate water supplies.

- D. Six dams (five generating hydropower) use the Klamath River. They generate a total of 160 megawatts.
1. The dam lowest on the River, Iron Gate Dam, is currently the upstream barrier to anadromous fish passage. Salmon runs to the Upper Basin were first barred by the Copco I dam in 1920. Both Indians and non-Indians protested. Fish passage devices were promised but not built. A hatchery was said to be sufficient mitigation.
 2. All six dams are part of the same FERC license. The license comes up for review in 2006 (FERC license 2082). Activities related to license review have already begun.
 - a. The license holder is beginning endangered species mitigation measures, particularly wetland restoration.
 - b. Study of the flow requirements for anadromous fish are beginning.
 3. A FERC proceeding under the existing license has begun as a result of irrigation interests threatening the power company with suit if the company releases water for salmon in amounts determined necessary by Reclamation.
 4. The existing FERC license requires the release of specified amounts of water below Iron Gate Dam. There is great debate over whether these flows are an expression of the biological needs of downstream fisheries and, if so, whether they accurately describe those needs.
- E. Recreation is potentially a major revenue producer in the Klamath Basin.
1. Upper Klamath Lake's huge surface area (approximately 70,000 acres) and constant winds make it a premier lightning-class sailboat lake until July or August when water withdrawals render it too shallow.
 2. The mainstem Klamath River includes a designated Wild & Scenic stretch and all classes of rafting.
 3. Historically abundant fish and wildlife brought sportspersons from all

over the continent. Remnants of these features are still found. A trophy trout fishery persists in a corner of Upper Klamath Lake where tributaries of adequate water quality remain, and trout fisheries in the rivers are popular. A salmon sports fishery takes place most years at the mouth of the River. Waterfowl still bring hunters to the Basin.

III. A synopsis of the history of Klamath Basin water management

- 1860-80 Tribal treaty commitments: In the late 19th century the United States negotiated treaties with the Oregon tribes and made similar agreements with California tribes. The treaties and Executive Orders secured to the tribes continued rights their fisheries and water to support those fisheries (see, e.g., United States v. Adair, 723 F.2d 1394 (9th Cir. 1983); Parravano v. Babbitt, 861 F.Supp. 914 (N.D. Cal. 1994), aff'd 70 F.3d 539 (9th Cir.1995), cert. denied 116 S.Ct. 2546 (1996).
- 1905-20 Reclamation Project and hydropower initial development: The first attempts at farm-scale irrigation in the Basin proved too expensive for individual farmers and ranchers. Federal support was sought. Congress authorized the Klamath Project in 1905. Federal resources, too, proved inadequate and Link River Dam was ultimately built by the power company.
- 1908 First Klamath Basin wildlife refuge established: President Roosevelt created the Nation's first waterfowl refuge in 1908. (Executive Order 924 (President Theodore Roosevelt) August 8, 1908.)
- 1915-18 First Lost River Adjudication: Competing water demands among irrigation interests were already making themselves felt. Oregon saw a need to formally adjudicate the Lost River Basin water rights.
- 1925-40 Wildlife Refuges created and expanded: The value of Basin wetlands to the Pacific Flyway was recognized early in the century. In the next decades the refuges multiplied and were expanded, particularly to protect migratory birds (Executive Order 4975 (President Calvin Coolidge),

- October 4, 1928 (Tule Lake Bird Refuge); Executive Order 4851 (President Calvin Coolidge), 1928 (Upper Klamath NWR); Executive Order 1332 (President William Taft), 1911 (Clear Lake NWR).
- 1940-70 Irrigation and hydropower expansion: The Klamath Project grew to include 220,000 acres. More dams were added to the River bringing total generating capacity to 160 megawatts. Releases for downstream flows are specified, but their adequacy for fisheries is undocumented.
- 1950-57 Klamath River Basin Compact: Oregon and California irrigation interested recognized that water supplies were limited and could lead to disputes among the states and their irrigators. An interstate Compact was negotiated and approved by Congress. It allocates irrigation acreage between the states (200,000 acres maximum in Oregon and 100,000 in California) and establishes priorities for types of water use in both states, giving emphasis to irrigation over wildlife and hydropower. Indian water rights are protected by the "no impact intended" clause in Article X. The Compact creates a Commission as a forum for the resolution of water conflicts (Or. Rev. Stat. 542.610; Cal. Statutes Cpt. 113; P.L. 222, 85th Cong. 2nd Sess., Signed by President August 30, 1957).
- 1977-84 Federal/state water rights litigation and jurisdictional struggles begin: By the mid 1970's not enough water was reaching Klamath Forest NWR. The United States filed suit in federal court seeking to restrict withdrawals upstream of the NWR. Oregon began the Klamath Basin Adjudication in part to try to remove the case from the federal courts to the state water agency. The Klamath Tribes intervened to assert a right to sufficient water to protect their treaty fishing, hunting, and gathering rights. Ultimately the courts decreed the existence of the federal and tribal rights, but left quantification of those rights for later proceedings (United States v. Adair, 723 F.2d 1394 (9th Cir. 1983)).
- 1982-89 Supplemental Lost River Adjudication: Increasing water demands required another, supplemental, adjudication of the Lost River water rights

- first adjudicated in 1918.
- 1988 First Endangered Species Act fish listing: Precipitous declines in the c'wam and quapdo populations led the Klamath Tribes to close their fisheries in the mid-1980's. Oregon listed the fish and closed the fishery in 1987. The fish were listed as endangered in 1988. Hybridization caused by dams, migration restriction by dams, diversion of habitat waters for irrigation, and other habitat losses are contributing factors to the listing (53 Fed. Reg. 27132, July 18, 1988).
- 1990-95 Jurisdictional litigation: Oregon reasserted its authority to adjudicate all Klamath Basin water rights. The federal and tribal governments challenged the state's jurisdiction under the McCarran Amendment (43 USC §666) on several grounds including the state's failure to include groundwater in the adjudication and the absence of immediate judicial supervision of the adjudication proceedings. State jurisdiction was upheld by the federal courts (United States v. Oregon, 774 F.Supp. 1568 (D. Or. 1991), aff'd 44 F.3d 758 (9th Cir. 1994), cert. denied 116 S.Ct. 378, 133 L.Ed.2d 302 (1995)).
- 1995-present Resumption of Klamath Basin Adjudication: After clearing the jurisdictional challenges, Oregon resumed its Klamath Basin Adjudication. The claim filing deadline was set for April 30, 1997. The state's timetable intends to reach a decision in two to three years. The Adjudication will address only the priority and quantity of competing water rights. Alleviating water supply shortages, reducing excess demand, and augmenting supply are not a part of the Adjudication.
- 1996 Settlement initiatives begin: Processes to balance Basin water supply and demand were begun on at least two fronts. On one front, the Klamath Tribes approached Oregon, through the Oregon Water Resources Department, proposing that the Adjudication be replaced with or accompanied by a settlement negotiation process that could include a broader range of water management techniques. The state has responded

favorably. Elsewhere, the Klamath Compact Commission has begun a public education process intended to lead to a Basin-wide resolution of water management and supply issues.

1997 Second Endangered Species listing(s?): Coho salmon in the Klamath River were listed as threatened on April 25, 1997. This will lead to consultation on the water needs of the fish and, most likely, to further restrictions on water management that affects the mainstem Klamath River. A proposed listing of bull trout can have a pronounced effect on Basin water management because the fish are found throughout the Upper Basin and possibly in the Lower Basin as well.

2001-06 Dam licensing renewal proceedings: The six Klamath River dams are all included in a single FERC license (FERC license 2082). The license comes up for renewal in 2006. Initial steps, and jockeying for position, are already taking place. Leading issues are likely to include flow releases to support anadromous fish and the provision of fish passage mechanisms to allow anadromous fish to return to the Upper Basin.

IV. Reconciling irrigation and power generation with fishery and natural resource needs.

- A. Water management in the Klamath Basin has until very recently been characterized by separate and independent consideration of the values of water-dependent resources. Recent moves toward more integrated management will need to continue and be accelerated.
 - 1. Water quality is a new management issue that will need to be accommodated. Previous management generally ignored growing water quality problems in the Basin.
 - a. In the Upper Klamath Basin water quality is leading to endangered species listings and restrictions of water management options.
 - b. In the Lower Klamath Basin water quality problems imported from the Upper Basin are complicating hatchery operations. Temperature problems imperil anadromous fish runs.

2. The water demands of various uses need to be better understood and more generally agreed upon. The fear of quantification must be addressed; “adaptive management” sounds good, but in a dry year *everyone* wants more water, so adaptation is difficult.
 - a. Fishery water needs are still too often said to be impossible to quantify and therefore not deserving of any specifiable allocation of water — the “Perfect Science Syndrome.”
 - i. Instream flow evaluations for fisheries are under way but are much disputed. Some interests appear to be blocking this work out of fear of what the results will show.
 - ii. Lacustrine species’ needs are much studied but not widely agreed upon. Myths, for example, the legend of historical failed attempts to exterminate species now listed as endangered, have not been dispelled.
 - b. Agricultural uses are only roughly quantified in the Project; outside the Project they are barely monitored or measured. Quantification is threatening in the face of weather uncertainty and the possibility that crops will need additional water.
 - c. The role of power generation in the hierarchy is only now coming under scrutiny. The hydropower company has apparently been satisfied with the various water management regimes up to this point. Now, however, it feels itself pinched between competing interests and threatened with litigation by agricultural interests if it complies with federal instructions regarding fishery protection.
3. Allocating the burden of water shortage must be addressed. The burden has traditionally been assigned to fisheries. This is beginning to change, and other water users, particularly irrigated agriculture, are being asked or required to shoulder some of this burden. Allocating the burden is proving to be very difficult; a new burden is never eagerly assumed.
4. Dams need to become more fish sensitive both physically and

operationally. Anadromous fish passage techniques must be evaluated to restore access to Upper Basin habitats. Flow releases for fisheries must be determined, and despite the Perfect Science Syndrome a commitment made to improve and protect these flows.

5. Certainty will have to be balanced with flexibility. Everyone wants certainty, but the water supply is inherently uncertain. This is especially true in the Klamath Basin where water storage capacity is a sharply limiting factor. "Adaptive management" is an appealing principle, but unless it is spelled out in some detail, it only obscures underlying problems; each interest interprets it to mean that everyone else will adapt to their needs, for example, fishery interests think they'll get more water when they need it, but agricultural interests think the same thing. It does not chase the devil from the details.

B. Water demand in the Klamath Basin exceeds water supply. Management must address this immutable fact.

1. Management should acknowledge a goal of balancing water supply and demand, beyond the immediate imperative of allocating existing water supply. Various interests have begun a supply augmentation initiative. This will need to include all relevant parties, and will need to countenance demand reduction, as well.
2. The temptation to view the General Stream Adjudication as a dispositive tool must be resisted.
 - a. It is a win-lose process that assigns the burden of water shortage to a narrow class of losers. The losers will continue to pose a problem for the Basin because no class of water interests will simply pack up and go away.
 - i. If the losers are agricultural and developmental interests there will be economic hardship and displacement.
 - ii. If the losers are natural systems and environmental interests the result will be increasing environmental problems,

endangered species listings, and restrictions on water management options.

- b. Its scope is too narrow, addressing only priority dates and quantities. It cannot address water supply augmentation, demand reduction, or water quality and habitat improvement.
3. A win-win outcome must be sought that balances supply and demand without placing the burden of water shortage on any one water dependent interest. A negotiated, community wide settlement will allow a broader range of problems and solutions to be addressed. This will require communication among groups who have historically not had to deal with one another, who have not had to quantify their needs and desires, and who speak and see the world in very different terms. It is an enormous challenge but nothing short of addressing the challenge will do justice to Klamath Basin citizens.

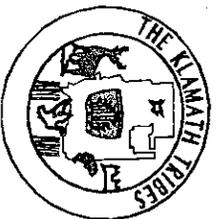
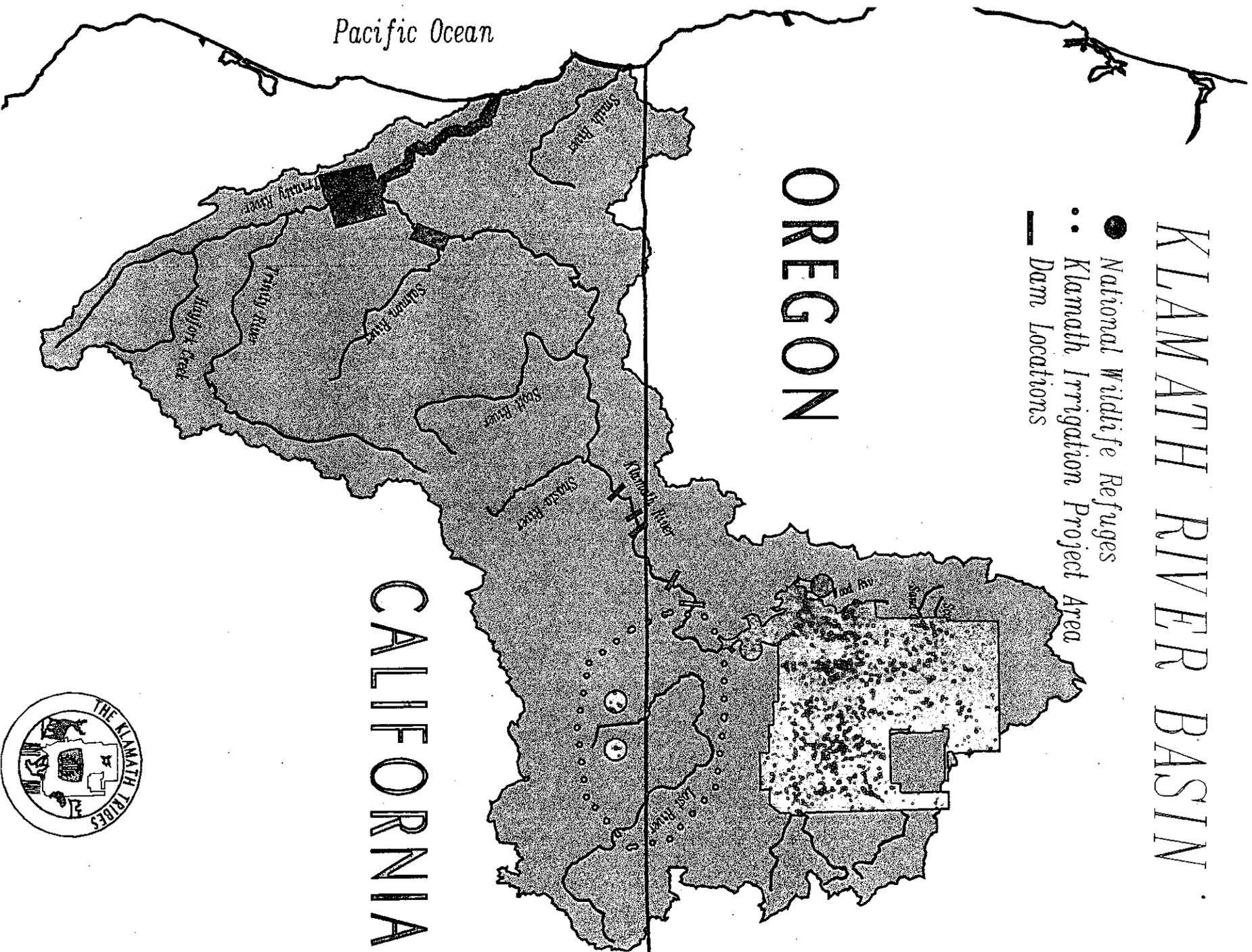
KLAMATH RIVER BASIN

- National Wildlife Refuges
- Klamath Irrigation Project Area
- Dam Locations

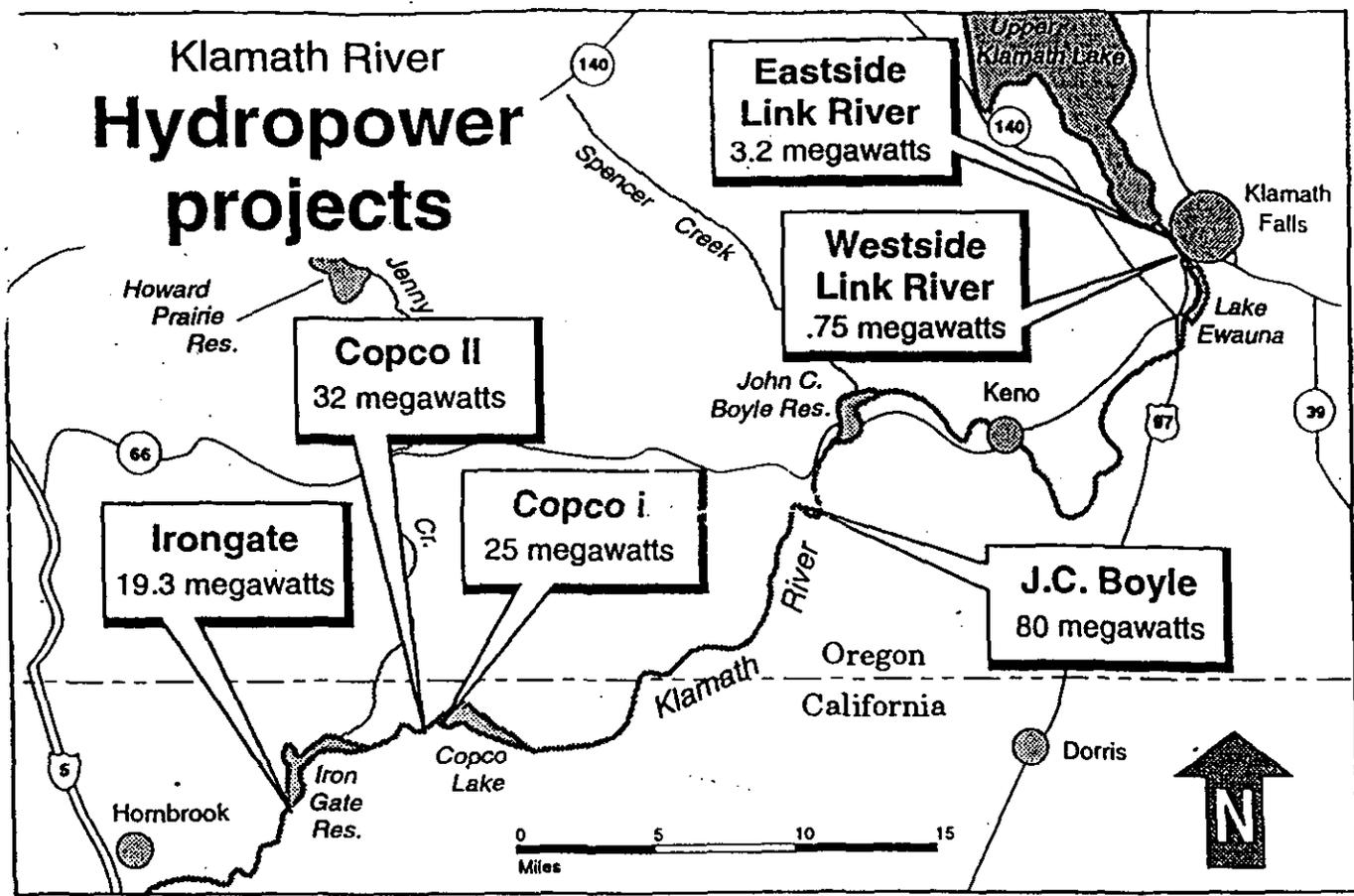
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Klamath River Hydropower projects



H&N Graphic by Todd Kepple

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